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PELVIC OVARIAN AND VULVAR VEINS

Does left ovarian vein reflux cause a pseudo-nutcracker effect creating meso-aortic narrowing of the left renal vein?

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Background: In June 2016 we introduced trans-abdominal duplex ultrasound (TADUS) to evaluate the left renal vein (LRV) alongside transvaginal duplex ultrasound (TVDUS) performed for pelvic venous reflux[1]. LRV diameters pre and post pelvic vein embolization (PVE) were evaluated.
Methods: 17 female patients (age 26-56, mean 43) had diagnostic TVDUS and TADUS prior to PVE and 6 weeks after. 2 patients with pelvic congestion syndrome (PCS), 10 with leg varices and PCS, 7 with leg symptoms only. 2 groups were analysed.
Group 1, 10/17 patients exhibited entire left ovarian vein (LOV) reflux.
Group 2, 5/17 patients with no LOV reflux plus 2/17 patients exhibiting distal LOV reflux only.
TADUS performed with patients erect and 30^{O} recumbent to examine LRV [2&3].
Pre/post PVE AP diameters of the hilar and mesoaortic LRV and ratios were recorded.
Results: Group 1: 9 patients with LOV reflux had pre PVE hilar to mesoaortic diameter ratios with a mean of **4.8** and post PVE ratios with a mean **2.2** (P=0.009)
Group 2: 7 patients, 5 without LOV reflux and 2 with LOV reflux distally had pre PVE ratios with a mean of **1.9** and post PVE mean ratio of **1.6** (P=0.667)
Conclusions: Nutcracker phenomena has been suggested as the cause of LOV reflux[3]. This study demonstrates LOV reflux causes a syphon effect with flow from the LRV draining into the pelvis in the erect position. This results in physiological narrowing of the mesoaortic LRV. This effect is relieved following PVE of the LOV.

Analysis of a retrospective pelvic embolization audit for the evaluation of post embolization symptoms

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Background: Pelvic Congestion syndrome (PCS) is associated with pelvic venous reflux (PVR) in many cases. Pelvic vein embolization (PVE) is the established safe and effective method of treatment for PVR. Patients from our unit have reported flu-like symptoms post embolization. However, there is no data in the literature to support this phenomenon. This study aims to report on the analysis of the pattern of post treatment symptoms experienced by patients.
Methods: A retrospective audit of post embolization symptoms was conducted. Patients were diagnosed with PVR using transvaginal duplex ultrasound and were treated with transjugular PVE. Patients seen in our unit between April 2014 and October 2016, N.=117, were sent a questionnaire to evaluate symptoms with focus on three specific areas: pain, presence of flu-like symptoms and impact on quality of life.
Results: Thirty-five patients aged 33-77 years responded to the questionnaire (response rate 29.9%). At a mean follow-up of 15 months (±7), 82.9% of patients were pain free. Flu-like symptoms were experienced by 28.5% after embolization (N.=35), and two thirds of these patients stated symptoms were limited to 1 to 2 days. The inability to continue daily activities affected 90% of patients with flu-like symptoms.
Conclusions: PVE is an effective treatment for PVR and is in line with results from other studies. Preliminary results suggest that flu-like symptoms manifested post embolization are not unusual and can impact patients' quality of life. Further work is required before significance can be determined.

To assess reflux patterns and the results of endovascular obliteration of ovarian veins in patients with symptomatic pelvic venous incompetence (PVI)

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Background: To assess reflux patterns and the results of endovascular obliteration of ovarian veins in patients with symptomatic pelvic venous incompetence (PVI).
Methods: A total of 71 female patients (mean age 49 years) with signs of PVI on selective phlebography of the pelvic veins were included in the study. In 53 cases (75%), recurrent varicose veins following previous surgery and stripping of the great saphenous vein were present and 51 patients (72%) were multiparous (≥2 children). Symptoms were scored on a visual analogue scale (VAS) assessing pelvic and lower limb pain. After duplex ultrasonography of the lower limb veins, in cases of suspected PVI, the presence of any reflux in the ovarian and pelvic veins was demonstrated by phlebography. In selected cases, endovascular treatment with embolization was used. Follow-up assessment of symptoms was carried out at 1, 2 and 3 years.
Results: The left ovarian vein (OV) and the right internal iliac vein (IIV) were most frequently affected by reflux (N.=41, 58% each). In about half the number of patients, reflux was demonstrated in more than one of the main pelvic veins (N.=38, 54%). An extension of reflux into varicose veins of the groin or lower limb was demonstrated in 44 patients (62%); Improved symptoms were detected in patients with isolated IIV incompetence, who underwent embolization treatment although this did not reach statistical significance. Conservative treatment of patients with isolated IIV incompetence resulted in no relevant changes. Worsening of symptoms was found in patients with combined reflux who underwent conservative treatment. In case of combined OV and IIV reflux, isolated interventional treatment of incompetent ovarian veins did not improve symptoms at each interval of the follow-up, while coiling of all reflux

pathways resulted in symptom reduction; but this did not reach statistical significance due to the small numbers of patients
Conclusions: Combined reflux in more than one pelvic vein is common. In these cases, isolated treatment of ovarian veins or conservative treatment is associated with a poor midterm clinical outcome. A clinical improvement was achieved only in patients with isolated ovarian vein incompetence.

Iliac vein stenting can reverse incompetence in patients with pelvic congestion syndrome

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Background: Pelvic congestion syndrome (PCS) is widely thought to be due to gonadal or internal iliac vein reflux or compression syndromes of the iliac or renal veins such as May-Thurner. We evaluated the treatment response following iliac vein stenting alone in a group of women presenting with severe iliac stenosis, with or without concomitant renal vein compression or gonadal reflux.
Methods: Between June 2016 & July 2017 patients with symptoms of PCS severely affecting their Quality of Life (QOL) were evaluated with transabdominal ultrasound (TAU) and results confirmed on venography. 61 patients were then treated for severe venous outflow obstruction with ilio-caval stenting. Patients were closely followed-up with TAU, clinical assessment and QOL assessment tools.
Results: TAU suggested moderate to severe stenosis in 61 patients. Follow-up venography confirmed outflow obstruction with pelvic collaterals and severe stagnation of contrast in all patients. 27 of these patients were also found to have gonadal reflux, 5 had previously had gonadal coiling & 16 had concomitant renal vein compression on duplex. At follow-up 32 patients had complete resolution of pelvic pain, 7 patients had resolution of dyspareunia & 13 had resolution of other symptoms such as buttock pain, lower back pain, bloating & appearance of varicose veins. Of the 52 patients who experienced left lower extremity pain or oedema before treatment, >50% had complete resolution after treatment with 30% showing objective improvement of the oedema. Follow-up TAU found all stents to be widely patent. 16 patients have had reversal of incompetence with more expected as we continue with follow-up assessments. No patient required embolization.
Note: The numbers in this study are yet to be finalized as some patients are still to undergo F/U assessment.
Conclusions: Ilio-caval obstruction is an underdiagnosed and undertreated cause of PCS. Venous angioplasty and stenting provides excellent results, with resolution of chronic pelvic pain, dyspareunia & in some cases even resolution of incompetence. It should be considered as the primary treatment for this pathology even in the presence of concomitant gonadal incompetence of renal vein compression.

New gold standard for investigation of pelvic vein reflux

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Background: In September 2016, trans-abdominal duplex ultrasound (TADUS), trans-vaginal duplex ultrasound (TVDUS) and trans-labial duplex ultrasound (TLDUS) was introduced as a new gold standard for investigation of pelvic vein reflux. 141 female patients underwent this new protocol and their reflux patterns were analysed.
Methods: TADUS performed with patients erect and 30o to examine left renal vein (LRV), iliac veins and proximal ovarian veins, and TVDUS to assess right and left distal ovarian veins (ROV/LOV) and internal iliac veins (RIIV/LIIV) in three groups with the following presentations: Group 1: 28/141 pelvic congestion syndrome, Group 2: 6/141 symptomatic labial varicositiesGroup 3: 107/141 leg varicose veins with pelvic communication. 60/107 displayed pelvic symptoms.
Results: Regions of reflux was recorded in combination of the four territories Group 1: 10/28 all 4 regions, 11/28 3 regions, 7/28 2 regions. LOV reflux distal: in 21/28, proximal: 11/28. 1/28 LRV nutcracker, 1/28 confirmed May-Thurner. Group 2: 4/6 2 regions, 2/6 1 region. LOV reflux distal 4/6, proximal 0/6. 0/6 LRV nutcracker/May-Thurner. Group 3: 13/107 all 4 regions, 42/107 3 regions, 24/107 2 regions, 5/107 1 region, 23/107 0 pelvic reflux. LOV reflux distal: in 55/107, proximal: 16/107. 3/107 LRV nutcracker, 1/107 May-Thurner.
Conclusions: This new protocol proves effective in evaluation of reflux territories and severity. It demonstrates low levels of confirmed LRV nutcracker and May-Thurner compared to physiological reflux as the major cause of pelvic vein symptoms in all three groups.

Complications after pelvic vein embolization for the treatment of pelvic congestion syndrome

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Background: Pelvic congestion syndrome, which is one of the important cause of chronic pelvic pain, occur 6-11% of women in reproductive age. Pelvic vein embolization is the method of choice for the treatment of this condition. Complication rate is important criteria for assessment of effectiveness of each treatment option. The aim of current study was evaluation of complications after pelvic vein embolization in population with primary pelvic vein dilatation.
Methods: Retrospectively was analysed data of 134 patients to whom were done pelvic vein embolization. The mean age was 27,6 (18 – 47) year. Embolization were provided from brachial or femoral access. As an embolization material was used sclerosing foam and mechanical embolization devices (pushable or detachable coils, occluders). Follow-up period was 60 months.
Results: Pelvic vein embolization completely was done in 133 cases (99,2%). Only in one case with congenital looping of left gonadal vein was impossible to provide embolization. The main complications were: access site superficial haematoma – 4 cases, thrombosis of cephalic vein – 2 cases. Postembolization syndrome was manifested in 16 (11,9%) cases. No vein perforation,coil migration, cardiac arrythmias or allergic reactions were detected
Conclusions: Pelvic vein embolization for the treatment of pelvic congestion syndrome is characterized with high efficiency and low rate of complications.

Duplex ultrasound imaging in pelvic venous reflux disease and lessons learned about nut-cracker and "Pseudo-nut-cracker" syndrome - Working group diagnosis and treatment of pelvic congestion syndrome

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Background: Pelvic congestion syndrome (PCS) has a strong association with pelvic venous reflux (PVR) and pelvic venous obstruction (PVO). Currently, several imaging modalities are used in the diagnosis of PCS but none are perfect. This presentation looks at the role of duplex ultrasound in the diagnosis or PCS and reports new findings of "pseudo-nutcracker" syndrome.
Methods: Transvaginal duplex ultrasound scanning (TVUS) using the Holdstock Protocol has been our method of diagnosing PVR since 2000. We have compared TVUS to venography, ovarian vein diameter and clinical outcomes after embolization. We have now added transabdominal duplex ultrasound (TAUS) to our protocol, looking for May-Thurner syndrome (MTS), Non-Thrombotic Iliac Vein Lesions (NIVL) and Nut-Cracker syndrome (NCS).
Results: We have shown that diagnosis of PVR by TVUS correlates better with outcomes better than venography. Also, we have shown there is no correlation between ovarian vein diameter and reflux – nullifying any imaging technique using vein diameter. The addition of TAUS has allowed us to look for PVO. David Beckett has noted that scans suggesting nut-cracker syndrome pre-embolization (>5 fold narrowing of the left renal vein and left ovarian vein reflux) can resolve after embolization of the left ovarian vein – suggesting the ovarian vein reflux is a sump causing the appearance rather than a high-pressure bypass of a stenosis. This has been confirmed by Judy Holdstock.
Conclusions: TVUS using the Holdstock Protocol with TAUS appears to be the current gold-standard for imaging PCS. "Pseudo-Nutcracker syndrome" is described where the appearance of NCS disappears after embolization of the reflux.

Patterns of pelvic venous duplex findings in patients who present with varicose veins

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Three hundred and thirteen patients with varicose veins, who presented for duplex ultrasound, had an abdominal and pelvic duplex scan. The aim was to assess the patterns of venous findings including iliac venous compression, left renal vein compression, ovarian vein incompetence and internal iliac vein incompetence. The age distribution, incidence and relationship between findings will be discussed.

Treatment with foam sclerotherapy: advantages and limits in pelvic, ovarian and vulvar veins

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Background: Pelvic congestion syndrome is a recently recognized clinical problem due to pelvic vein insufficiency. Sometimes, propagation of venous reflux into the lower extremities causes varicose veins and chronic venous disease (CVD).
The present author proposes a different approach to the treatment of these points of reflux, above all with regard to point P, through the injection of sclerosant foam with colour-duplex ultrasound guide.
Methods: 647 consecutive women patients, affected by CVD of the lower limbs, underwent both clinical and colour duplex investigation, demonstrating in 95 women (age 32-66 years) venous reflux from the vein of the Alcock channel. They underwent one session of ultrasound guided foam sclerotherapy, followed in 22 cases, by a second stage injection after 3 weeks. Follow-up includes clinical as well as ultrasonographic evaluation.
Results: The average follow-up lasted 24 months. No minor nor major complications have been reported. Reflux through the Alcock channel vein as well as the connected varicose veins disappeared in the treated area entirely.
Conclusions: Our experience demonstrates that in the case of pelvic varicocoele with escape points towards the lower limbs, ultrasound guided foam, sclerotherapy may represent a first choice method, thanks to its safety and efficacy which is achievable after a short learning curve. Ultrasound –guided foam sclerotherapy, in the short term, seems to be both effective and minimally invasive for treating such an atypical albeit frequent pattern of reflux in women. Further research will be necessary in order to validate this technique in the long term.

CHRONIC VENOUS DISEASE

A Ca and Cb for each C class of the CEAP classification Duplex ultrasound, clinical and quality of life correlates in chronic venous disease

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Background: Chronic venous disease(CVD) presents an epidemiological, societal and financial burden. Clinical assessment includes Clinical, Etiological, Anatomical, Pathophysiological(CEAP) staging and measures of disease severity, such as the Venous Clinical Severity Score(VCSS). Duplex ultrasound(DUS) is the gold standard imaging tool, providing anatomical and haemodynamic information. Quality of life tools(QoL) are important in the holistic assessment of the CVD patient.
Although QoL is correlates with disease severity, the relationship with the presence of reflux and vein diameter is less clear.
The aims of this study were: to compare DUS data with disease-specific clinical and QoL data in CVD patients and healthy volunteers; to correlate the number of refluxing trunks and maximal vein diameter with clinical and QoL features.
Methods: Participants were prospectively recruited from a tertiary center (2013 – 2017) and imaged with DUS of the lower limb(s), recording the number of refluxing trunks and maximal vein diameter. CEAP class, VCSS and Aberdeen Varicose Vein Questionnaire (AVVQ) results were recorded.
Statistical testing was performed using SPSS™. Spearman's correlation was employed to explore the relationship between duplex and disease specific data.
Results: 792 participants were recruited: 687 patients (51% female), with a mean age of 52.2 years (SD±17: range 18-96) and 105 control subjects (62% female), with mean age of 36.2 years (±12.4; range 21-88).
A weak positive correlation was identified between maximal vein diameter and AVVQ (Spearman coefficient r_s=0.276; P<0.01), CEAP (r_s=0.298; P<0.01) and VCSS (r_s=0.344, P<0.01). Conversely, moderate correlation was identified between the number of trunks affected by venous reflux and AVVQ (r_s=0.428; P<0.01), CEAP (r_s=0.44; P<0.01) and VCSS (r_s=0.408; P<0.01).
Conclusions: A weak correlation exists between CEAP, VCSS and AVVQ and maximal vein diameter, suggesting this may have limited utility in the assessment of the patient with CVD. A moderate correlation exists between the number of trunks affected and both clinical and QoL scores, highlighting the importance of accurate DUS assessment in CVD patients.

Clinical and quality of life characteristics of CVD patients in a metropolitan vein center

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Background: Chronic venous disease (CVD) is a common condition with an important clinical and socio-economic burden. Quality of life (QoL) tools, both generic and disease-specific, have been recognized as being a key component in the assessment of the individual with CVD. The aim of this study was to explore the correlation between Clinical, Etiological, Anatomical, Pathophysiological (CEAP) class, demographics and disease specific QoL in a population of CVD patients and asymptomatic volunteers.
Methods: Participants were recruited from a single center (October 2014-June 2016). Individuals with clinical symptoms of CVD scheduled for intervention and asymptomatic individuals were invited to participate. Demographic data, CEAP classification, venous clinical severity scoring (VCSS) and Aberdeen varicose vein questionnaire (AVVQ) data were collected.
Results: 517 individuals with CVD and 105 healthy volunteers were recruited. Median age, body mass index (BMI) and parity history were differentially distributed in the two groups (P<0.05). CEAP distribution across the whole population was: C0-11.7%, C1-5.5%, C2-40.5%, C3-10%, C4-23%, C5-5%, C6-4.3%. Median VCSS and AVVQ values ranged from 0-16 and 0-44.6 respectively, both exhibiting statistically significant correlation with increasing CEAP class (P<0.01). There was a statistically significant positive correlation between AVVQ and VCSS (P<0.01, Spearman's rank order correlation coefficient 0.729).
Conclusions: The data reveals differential demographic and clinical data in CVD *vs.* control groups. Disease specific QoL was found to significantly correlate with both CEAP class and disease severity scoring, highlighting the importance of QoL assessment in these patients.

A systematic review of peripheral blood biomarkers in primary chronic venous disease

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Background: This systematic review aimed to explore the literature on the relationship between circulating biomarkers and primary chronic venous disease, as the pathogenesis, aetiology and progression of the condition is still poorly understood.
Methods: A systematic literature search was conducted in MEDLINE and EMBASE using search terms pertaining to primary chronic venous disease and circulating biomarkers, including "homocysteine", "D-dimer" and "vascular endothelial growth factor". The inclusion criteria for identified studies included those reporting measurements of circulating biomarkers in chronic venous disease according to the Clinical Etiological Anatomical Pathophysiological (CEAP) classification system published after 1st March 1994 in English.
Results: Concentrations of homocysteine, D-dimer and vascular endothelial growth factor were more elevated in cases compared to controls, and increased with increasing CEAP stage. Of the three biomarkers, homocysteine was the most significantly and consistently associated with chronic venous disease. The concentration of all biomarkers was more elevated in samples from the leg compared to the arm in the same individual.
Conclusions: Further research into the association between biomarkers and primary chronic venous disease may provide insights into the pathogenesis of the condition, potentially enabling the stratification of vascular patients according to their risk of developing complications. However, for research in this field to progress, observational studies need to employ a more stringent quality criteria and standardized methodology. Longitudinal studies with larger sample sizes would also be beneficial in order to establish the true association between biomarkers and disease progression in primary chronic venous disease.

Calf volume reduces using intermittent thigh compression in patients and controls

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Background: Calf swelling can be reduced mechanically using compression bandages, medical compression stockings, direct intermittent pneumatic compression of the calf, elevation and by neuromuscular electrical stimulation. Using isolated thigh compression to achieve this is counter-intuitive. However, a temporary obstruction may act by opening up the venous drainage pathways thereby facilitating better outflow on relief from the obstruction. The aim was to investigate the effect of pneumatic thigh compression on calf volume.
Methods: Three groups of subjects were studied (N.=14 in each group). (i) Healthy controls without clinical evidence of venous disease. (ii) Patients with the post-thrombotic syndrome (PTS). (iii) Patients with lymphoedema confirmed by lymphoscintigraphy. A 12 cm diameter thigh-cuff (Hokanson®) was inflated to 80 mmHg until the calf no longer increased in volume. Then the cuff was deflated suddenly (VenaPulse® pump). The change in calf volume was measured using air-plethysmography (APG). The regional ethical approval number was 13/LO/0155.
Results: The thigh compression and deflation manoeuvre significantly reduced the volume of the calf in all 3 groups (Wilcoxon). Reported as median (inter-quartile range) the percentage change in calf volume was: Control 7.6 (4.2 - 9.1), P=.002; PTS 7 (4.2 - 10), P=.004; Lymphoedema 11.2 (7.3 - 16.3), P=.001. The lymphoedema group responded better statistically than the control group (P=.013, Mann-Whitney U-test).
Conclusions: A novel therapy for reducing calf swelling is proposed. However, the exact mechanism of action and the effect of more than 1 compression/relaxation cycle requires further investigation.

Risk factors for venous pain in patients with chronic venous disease: data from population-based epidemiological study

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Background: Venous pain is the important and one of the most prevalent symptoms of chronic venous disease (CVD). Meanwhile, many patients don't report they experienced venous pain having had the disease for a long time and/or suffered from severe CVD. The aim was to find the risk factors for developing of venous pain.
Methods: Data were obtained from cross-sectional study on the CVD prevalence in Kryukovo rural community in Central Russia. Patients were examined clinically and by duplex ultrasound. Demographical data, family history, medical history of the patient, signs and symptoms of CVD were recorded. For describing patients we used CEAP classification. For defining venous pain we used the latest recommendation of international consensuses. Multivariate logistic regression with venous pain as on outcome variable was performed. Odds ratios (OR) with 95% confidence intervals (CI) were calculated.
Results: Among 783 subjects of >10 years (mean age 49.3) we found CVD in 484 (61.8%). The prevalence of venous pain was 14.7% in CVD patients. The logistic regression revealed as a significant independent risk factors for venous pain female gender (OR 2.093, 95% CI 0.929-4.176, P<0.1), age (OR 1.021, 95% CI 0.997-1.046, P<0.1), presence of venous edema (OR 4.184, 95% CI 0.946-18.500, P<0.1), rough labour (OR 3.240, 95% CI 1.598-6.573, P<0.01).
Conclusions: Female gender, age, presence of venous edema, rough labour were confirmed as independent risk factors for venous pain in patients with CVD.

Quantifying superficial venous insufficiency by comparing four hemodynamic tests

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Background: Reflux measurements are qualitative. Quantitative measurements of superficial venous insufficiency (SVI) include the venous arterial flow index (VAFI), the saphenous recirculation index (RCI), the venous filling index (VFI) and the postural diameter change (PDC) of the saphenous trunk. The objective was to investigate their relationship.
Methods: Four haemodynamic parameters were measured in 21 legs from 16 subjects. Legs were divided into Group A (no reflux, N.=7) and group B (reflux, N.=14). The VAFI is the ratio of the common femoral vein volume flow divided by the common femoral artery volume flow. The RCI is the ratio of reflux volume over antegrade volume after calf compression. The VFI is the rate of calf volume increase on dependency measured in mL/s, using air-plethysmography. The PDC is the percentage reduction of the saphenous trunk diameter from standing to lying. The University of Lübeck ethics commission, approved the study.
Results: The clinical part of the CEAP classification was: C_0=3,C_1=4,C_2=5, C_3=1,C_{4a}=1,C_{4b}=6,C_5=1. All 4 tests demonstrated significant differences between the 2 groups with minimal overlap (Mann-Whitney U-test): VAFI (P=.028), RCI (P<.0005), VFI (P=.001) and PDC (P=.014). Furthermore, significant correlations were observed with the tests: VAFI *vs.* RCI (r=.532, P=.015), VFI (r=.489, P=.025) and PDC (r=-.474, P=.030). RCI *vs.* VFI (r=.446, P=.043) and PDC (r=-.527, P=.014).
Conclusions: Superficial venous insufficiency can be quantified using the VAFI, RCI, VFI and PDC. However, understanding why there are significant relationships among these parameters requires further work.

SCLEROTHERAPY

Ultrasound guided foam sclerotherapy of the small saphenous vein: long term results

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Background: In a prospective trial we analysed the long term results of ultrasound guided sclerotherapy (UGFS) in case of small saphenous vein (SSV) insufficiency.
Methods: 100 consecutive pts with 104 effected limbs were included (mean follow-up 48 months). A single injection of foam (1-3% polidocanol), 1 to 5 ml (mean 2.61 ml), was given under ultrasound guidance. Retreatments were allowed and documented. Clinical and duplex controls were done after 1 week, after 6, 12, 24, 36, 48 and 60 months
Results: Including retreatments we achieved a complete SSV occlusion after 1 month in 90%, after 6 month in 76%, after 12 month in 79%, after 24 month in 83%, after 36 month in 74, after 48 month 67,4% and after 60 month in 70,9%
Conclusions: Under the condition of regular controlls with retreatments if needed UGFS of SSV leads to high rates of complete occlusion. Because of its high cost effectiveness, high patient's satisfaction and low morbidity UGFS should be considered as standard procedure in case of SSV insufficiency.

Foam prepared with pure oxygen decrease adverse effects in sclerotherapy

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Background: Sclerotherapy with Polidocanol Foam prepared with room air causes some adverse effects that can become dangerous, we seek to avoid or decrease the presence of these undesirable effects by preparing the foam with pure oxygen
Methods: The study was approved by the ethics committee and informed consent of the patients. The sclerotherapy was made with polidocanol Foam prepared with the gas-liquid proportion of Tessari's method; Two groups were formed, one was treated with polidocanol-room air foam and another with polidocanol-oxygen foam, which used pure oxygen instead room air. No special exclusion criteria between groups
Results: Patients=1240, Legs=1560. Adverse effects:Cough (0.13% O_2, 3.7% RA),Dizziness (0.06%O_2, 2.1% RA), Visual disturbances (0,O_2,1.4%RA), Back pain(0,O_2, 0.7% RA), Hypotension(0,O_2, 0,5%RA), Migraine (0,O_2, 0.2%RA). The effectiveness of treatment was the same in both groups, the Foam prepared with oxygen had better performance. A patient did severe Migrain episode with RA Foam, she before treated with liquid sclerosant without problem
Conclusions: Foam sclerotherapy performed with Oxygen is a good option to prevent and reduce adverse effects of polidocanol. Our theory is that O_2 bubbles allow gas to diffuse into the brain, the nitrogen on the other hand is not a physiological gas and creates anoxic zones which produce neurological symptoms. This does not have anything to do with endothelin. In the patien with migraine the proof would be sclerosing with Fom of polidocanol and oxygen and hope no migraine episode.

New photoplethysmographic outflow test (PPG-ouflow test) - Value for safe sclerotherapy of varicose veins (a pilot study)

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Background: In early 1980s photoplethysmography (PPG) become an integral part of vascular diagnostics. Progressive technical development of this method (digitization), quantification and standardization of different venous tests brought new possibilities of exact evaluation of venous function before, during and after sclerotherapy, as well as in venous surgery or endovenous procedures. The goal of our pilot study was to develop a simple PPG test for early identification of venodynamic changes (venous spasm). Detected abnormalities of venous outflow are considered a warning signal for a possible development of deep venous thrombosis (DVT) as a complication after sclerotherapy in calf region.
Methods: Visible venous spasm is an immediate phenomenon after sclerotherapy in superficial veins (particularly when using foam). This spasm is a temporary condition and disappears in seconds. However, if such spasm propagates into larger intramuscular and deep veins of a calf, it lasts longer and could be viewed as a warning signal for potential development of DVT.
In the first phase of our study (using the AngE Phlebo PPG - Sonotechnik, Austria) we tried to evaluate normal venous outflow during passive elevation test and compare it with the outflow values when simulating conditions during DVT(tourniquet test). In each of 150 measurements we observed decreased venous outflow from the calf region.
In the second phase of the study, we performed this test after 459 foam sclerotherapy treatments in the calf region. We found 21 …pathological" PPG outflow curves.
This study has an Ethics Approval from local Czech authorities.
Results: All patients included in this study were examined using DUS 3 and 7 days after the treatment and we identified 3 cases of thrombi propagation into the deep venous system on day 3 and another 5 on day 7. All of them were among those with …pathological" PPG-Ouflow test. After 10 days of LMWH application and compression, the Duplex scan showed normal results in all patients. No pulmonary embolism was observed.
Conclusions: While our preliminary results seem to be promising, we are aware, that a wide multicentric study is necessary for implementation of this new test to daily sclerotherapy practice.

Diminishing of blood content in the vein before sclerotherapy (without perivenous tumescent infiltration)

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Background: It is known that blood dilutes and neutralizes sclerosing agent. Several measures were taken to diminish blood content in the vein and their efficacy was evaluated by ultrasound and laboratory analysis.
Methods: 18 patients with great saphenous vein (GSV) insufficiency participated in the study. The thigh segment (<6,5 cm) was tested. Two or three cannulas were inserted. The glucose concentration was measured in the vein immediately before and then 5 resp. 15 seconds after completing the following steps: 1. leg elevation 30^o; 2. compression of

GSV at knee level; 3. instillation of sclerosing agent to induce spasm; 4. flushing of the vein with physiological saline. The presence of spasm was evaluated by ultrasound between steps 3 and 4 (only qualitatively).
Results: Spasm was achieved in all of the 33 evaluated segments. 49 blood samples were analysed. The median drop in glucose concentration in the second and third cannulas was 62% and 66% respectively in the early phase (after 5 sec.). The effect was not significantly different in the next 10 seconds. 17 samples could not be analysed because it was not possible to collect a sufficient amount of blood from the vein.
Conclusions: With a combination of several simple measures it is possible to diminish the blood content in the vein, whereby the effect lasts long enough to perform sclerotherapy. It is not yet known if it can reduce the recanalization rate.

Results of ultrasound-guided foam sclerotherapy for incompetent great saphenous vein without additional foam injections for varicose tributary veins: mid-term results

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Background: A five-year follow-up study was carried out to evaluate the feasibility, efficacy and safety of the ultrasound-guided foam sclerotherapy (UGFS) for incompetent great saphenous vein (GSV) without additional foam injections for varicose tributary veins.
Methods: Consecutive patients with 88 limbs out of 86 patients who had GSV incompetence were enrolled. All patients were placed supine and received ultrasound-guided foam sclerotherapy for refluxing great saphenous vein (GSV) using 3% polidocanol (POL)-foam with their affected leg elevated 30 degrees. Each visible varicose tributary vein was not injected. UGFS was the sole treatment modality used in all cases, and repeat UGFS was performed where indicated following serial follow-up ultrasound.
Results: During UGFS, successful needle placement and ultrasound-monitored foam injection was accomplished in all cases without complication. After the injection, qualitative ultrasonographic inspection of the foam demonstrated intense and diffuse vasospasm both proximally and distally, including varicose tributary veins. Complete vasospasm in the GSV was found in 81% of the treated limbs. No immediate and late complications that can be associated with UGFS, including migraine, dizziness, visual disturbance and venous thromboembolism, were found in this series. Kaplan-Meier life table analysis showed primary success at five years in 66% and secondary success after further treatment of recurrence by UGFS in 89%. Most recurrent varicose veins were considered due to GSV recanalization via competent tributary veins.
Conclusions: UGFS for incompetent GSV without additional foam injections for varicose tributary veins shows relative good mid-term results without any complications. However, there are still rooms for improvement in the rates of immediate vasospasm and the mid-term success by controlling competent tributary veins.

Tumescent assisted foam sclerotherapy: a valuable and economically effective method of large vessel sclerotherapy

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Background: Injections of the tumescent solution in the surrounding tissues let the vein lumen compress and decrease the volume of the foam required for vein sclerotherapy. In the study, a clinical efficacy of the US guided Tumescent Assisted Foam Sclerotherapy (TAFS) of the saphenous vein was evaluated.
Methods: 233 patients undergoing saphenous vein TAFS were prospectively evaluated and followed at least 12 months. Two methods of sclerotherapy based on short (group A) or long catheter (group B) implementation were used.
Results: After one year follow-up the occluded veins were confirmed in 90% of the treated patients, including 89% in the group A and 93.9% in the group B. Additionally, the partial vein occlusion was noticed in another 4.7% in the group A and in 4.8% in the group B. In both groups no serious adverse events related to the tumescent solution introduction were noticed and (in comparison with the historical cohorts) a significant foam volume decrease was noticed. The factors related to the treatment failure were: post-thrombotic veins and saphenous vein diameter >1 cm (especially if post-thrombotic or post-surgical veins were present). The costs in comparison with all novel endovenous techniques suggest the potential advantage of TAFS, especially in the countries where no reimbursement for novel ablation methods is available.
Conclusions: TAFS is a safe and cost-effective method of the large superficial vein sclerotherapy. An implementation of the tumescent solution decreases the foam volume required for the successful saphenous vein obliteration with satisfactory clinical efficacy.

Small diameter recanalization of the great saphenous vein after ultrasound-guided sclerotherapy: one and two-year follow-ups

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Background: Duplex ultrasound examination performed on patients previously treated for great saphenous vein (GSV) incompetence using ultrasound-guided foam sclerotherapy (UGFS) may identify small-diameter recanalizations. What are their significance and outcome?
The objective was to assess the anatomical outcome of small-diameter (≤3 mm) above-knee GSV recanalization
Methods: Patients treated by UGFS for GSV incompetence (from 1 to 10 years) and presenting a recanalization of the GSV trunk with a diameter ≤3 mm were enrolled in a prospective study.
The primary outcome was the diameter of the recanalized GSV trunk (15 cm below the SFJ).
The secondary outcome was the identification of factors that might affect GSV recanalization.
Patients were scheduled for a yearly follow-up assessment for the subsequent five years.
Results: Inclusion. 110 patients treated 4.1±2.6 years ago
C1:71% 87%: Asymptomatic Average VCSS: 1.6±1.3
Average diameter: 1.9±0.5 mm
One-year follow-up. Variation of the diameter from the inclusion:
Average diameter: 1.9±0.6mm P=0.04
Reduced/identical: 63%
Increased 0.1-0.5mm: 24%
Increased >0.5mm: 13%
Two-year follow-up. From the inclusion:
Average diameter 2.1±0.8mm P<0.01
Reduced/identical: 52%
Increased 0.1-0.5mm: 30%
Increased >0.5mm: 18%

No risk factors for progression were identified.
No clinical changes were reported.
Conclusions: It is common to observe small-diameter recanalizations of the GSV trunk in patients who had been treated by UGFS several years previously. Most of them are C1 and asymptomatic patients.
At one and two-year follow-ups, no increase of the recanalization diameter was observed in more than 50% of patients.
Small recanalization should not always be considered as a failure of treatment and there is a need to question the requirement for re-treating the GSV trunk once a small diameter recanalization has been identified.

Selective catheter-directed intraoperative foam sclerotherapy

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Background: Catheter directed sclerotherapy (CDS) involves the use of a long catheter to deliver a sclerosing agent into a target vessel under ultrasound guidance. CDS was developed to increase the safety and efficacy of ultrasound-guided sclerotherapy (UGS). CDS has a better safety profile when compared with UGS with virtually no risk of intra-arterial injection or sclerosant extravasation. CDS combined with using perivenous tumescent local anesthesia has positive effective to decrease vein size and blood content. It increases the success rate of CDS. What is the selective CDS? When did I perform selective CDS? Selective CDS is injection of sclerosant only to the tangled varicose at SFJ area. 1) In the case of recurrence with neovascularization at SFJ, It's hard to reoperation of GSV stump due to adhesion and easy bleeding of neovasculature. If it is applicable the CDS, it is easy method to close the reflux. 2) In the case of tangled varicose at SFJ, It's hard to division and easy to rupture of thin varicose vessels during division. And it's impossible to access SFJ by using endovenous ablation method (EVLA or RFA) or nonsurgical method like as VenaSeal. Intraoperative catheter directed sclerotherapy was performed by using 1:4 foam sclerotherapy with 1.5% sodium tetradecyl sulfate. It is important to identifying the injected sclerosant by using ultrasound monitoring. When the sclerosing agent are reaching to SFJ compress that point not to enter deep vein. I have experienced three cases. At 1week and 6 months follow-up sonogram after procedure, confirm that there is no DVT and obstruction of varicose.
Conclusions: The merit of my procedure. It is easy treatment method for complex varicose veins on SFJ area where impossible to access by endovenous ablation method. After selective CDS, the accessible GSV is treated by endovenous ablation. Which reduce the amount of sclerosing agent and decrease the side effect of sclerotherapy.

Foam sclerotherapy: state of the art

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Foam sclerotherapy has become widely used for the treatment of varicose veins. It is also often used for the treatment of venous malformations and pelvic varices.
Several different methods of treatment have been described with foam sclerotherapy. Some techniques have been rigorously evaluated and others have remained the author's personal method.
The outcome of foam sclerotherapy has been reported to have widely differing success rates. In this presentation, I review a number of strategies that have been published and compare the reported outcomes of treatment.
A limited number of randomized clinical trials of foam sclerotherapy have been published, some with satisfactory outcomes for foam sclerotherapy. Others have very poor results. I analyse the reasons for success and failure of this method.

NEW TECHNOLOGIES

Biompedance spectroscopy and volumetry: short-term monitoring of lymphedema treatment

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Background: To assess with bioimpedance spectroscopy (BIS) and circumference-based volumetry (VOL) short-term outcomes of lymphedema (LYM) intensive complex decongestive treatment (CDT).
Methods: Cohort study on 41 patients (15 M, 26 F, mean age 51 years) affected by primary or secondary LYM stage II/III of the lower limbs. CDT (manual and electro-sound lymphatic drainage, compression bandage and dietary supplements) was applied for 6 days. At the start (D0) and end (D6) of CDT, both VOL and BIS (U-400, Impedimed®) of total limb and leg were performed. L-Dex, resistance (fluid-related parameter) and reactance (tissue-related parameter) were extrapolated from BIS raw data.
Results: Total limb and leg VOL (mean value in cc and standard deviation) was respectively at D0 11072.9 (+/-4133.8) and 3150.8 (+/-780.7), at D6 10493 (+/-3492.4) (-5.2% and P=0.0014) and 2980.2 (+/-723) (-5.4% and P<0.001). L-Dex in the total limb was 18.9 (+/-19.7) at D0 and 14.8 (+/-16.5) (-21.5% and P<0.001) at D6. Resistance in the total limb and in the leg was respectively: at D0 200.4 (+/-44.6) and 117.5 (+/-46.2), at D6 237.5 (+/-51.6) (+18.5% and P<0.001) and 150 (+/-49.7) (+27.7% and P<0.001). Reactance in the total limb and in the leg was respectively: at D0 12.2 (+/-5.5) and 7.7 (+/-4.3), at D6 16.6 (+/-6.4) (+35.5% and P<0.001) and 11.5 (+/-5.2) (+ 49.6% and P<0001).
Conclusions: CDT on lymphedematous limbs was effective at short-term; both VOL and BIS data showed a statistically significant improvement with treatment. BIS proved helpful to assess fluid decrease/dislocation and tissue composition.

Randomized control trial: dosing of electrical stimulation in venous insufficiency

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Background: A pilot randomized controlled trial (RCT) proved neuromuscular electrical stimulation (NMES) improves venous flow parameters and orthostatic oedema in patients with chronic venous disease (CVD). This prospective RCT examines the effect of varying frequency of treatment with NMES.
Methods: Patients with CEAP C3-C5 CVD were randomized to Group A (no NMES), B (30 minutes of NMES daily) or C (60 minutes of NMES daily). Femoral vein flow parameters (time averaged mean velocity, TAMV and volume flow, VF) were measured using duplex ultrasound. Limb volumes before and after treatment were measured at week 0 and 6 using an optoelectric volumeter. Quality of life (QoL) was compared using validated questionnaires at baseline and 6 weeks.
Results: Seventy-six patients were allocated to groups A, B and C at equal ratios. Six patients were lost to follow-up. There was a significant difference between the groups in percentage change in TAMV (Group A +3.36%, B +26.58%, C +39.49%, P=0.0001) and VF (Group A +5.53%, B +28.81%, C +52.82%,P=0.0003) whilst using the device compared to rest. Limb volume following device usage increased significantly only in group A (A P<0.0001, B P=0.05, C P=0.05) but was no different with long term use. There was a significant difference in the venous clinical severity score between week 0 and 6 in groups A (6.32±2.41 *vs.* 7.32±3.00, P=0.04) and C (7.46±3.80 *vs.* 4.00±3.03, P=0.003) but not in other QoL measures.
Conclusions: This trial demonstrated a significant improvement in venous circulation and prevention of oedema with NMES in patients with CVD.

New generation of transilluminated powered phlebectomy (Trivex) procedures utilizing only tumescent anesthesia in appropriately selected patients: are the patients satisfied?

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Background: The patients' satisfaction following new generation of transilluminated powered phlebectomy (TRIVEX) procedures utilizing only tumescent anesthesia was examined.
Methods: Data including demographics, pain scores and duration of operation were collected. Patient satisfaction was examined by later phone survey with patients' answering the question: would you undergo this operation again if needed?
Results: Results will be presented at the Meeting as the study is still ongoing.
Conclusions: The performance of the procedure under tumescent anesthesia enables avoidance of possible complications of general or regional anesthesia, same-day discharge in most cases and easy positioning of patients during the operation which is needed to complete this extensive procedure. The main problem is pain during the operation even after preoperative oral sedation and pain distraction methods. However, most of the treated patients are willing to repeat the procedure if needed as they understand that it may be the best solution to their problem when the disease is very extensive, especially when they had previously undergone operations or foam sclerotherapy in the past. Most of our patients were also overweight, and had been advised to be treated conservatively, which left them unsatisfied.

Computational fluid dynamics analysis for the portal venous system and the simulation of a portosystemic shunt based on a CT scan feasibility study

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Background: A transjugular intrahepatic portosystemic shunt (TIPS) is a type of hemodynamic treatment for portal hypertension. Computational fluid dynamics (CFD) studies are widely used for arterial disease. The aim of this study was to explore the feasibility of a CFD study for the portal venous system and the simulation procedures of a TIPS based on computed tomography (CT) scan data.
Methods: We retrospectively reviewed a patient's hepatic contrast-enhanced CT scans before and after a TIPS procedure. The Digital Imaging and Communications in Medicine (DICOM) formatted clinical images were imported into the medical image processing software Mimics to reconstruct 3D models of the patient-specific portal venous system. A stent-graft was simulated with a Geometry module in the CFD software ANSYS and a CAD module in Mimics. The hemodynamic study was completed in ANSYS Workbench.

Results: The portal blood flow had a laminar pattern. Before the TIPS was inserted, the superior mesenteric vein (SMV) flushed exclusively the right portal branches, whereas the splenic vein (SV) flushed both the right and left portal branches. The pressure distribution was not uniform in the portal venous system. With the shunt, the pressure of the portal system decreased: some of the blood from the SMV was diverted, and the remaining flushed the right portal branches; the blood from the SV was almost all diverted. When the simulated stent-graft was intentionally positioned into the right portal branch or the portal trunk, different hemodynamic changes were observed through CFD analysis. The wall shear stress could also be analyzed for the patient's portal venous system with the shunt in place.
Conclusions: CFD study is technically available for the portal venous system before and after TIPS based on vascular geometry digitized from a CT image. The simulation of the stent-graft and the portal venous system could help foresee the hemodynamic changes of the system, which will help improve the design of the TIPS procedure.

Wise Information Technology (WIT) for VTE

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Background: To establish the prevention and control with Wise Information Technology (WIT) system of venous thromboembolism (VTE) in big data era.
Methods: Through the depth of integration of the HIS system, the West China Hospital mobile medical software and WeChat platform to build a big data era VTE prevention and control system. All patients in West China Hospital underwent VTE risk assessment and corresponding preventive measures according to different levels of risk on admission. Once the VTE was diagnosed, early automatically warning would be performed through the HIS system, WeChat mobile phone to remind the doctors of relevant departments (Department of vascular surgery, respiration, etc.). Through long-term follow-up management with mobile medical software, the patients would be subsumed into the VTE management group, even discharge to ensure the full course of treatment and avoid lost.
Results: The prevention and control system of VTE in West China Hospital has been successfully constructed with the depth of integration of the HIS system. Based on over 600,000 patients underwent primary evaluation by paper for more than 5 years, over 3,000 patients were brought into WIT system in recent 2 years.
Conclusions: Through electronic WIT systems, it is very efficient and convenient of prevention and control of VTE in the era of big data.

Ultrasound Guided Foam Phlebectomy (UGFP)

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Background: To describe a novel method for eliminating branch varicosities following endovenous truncal ablation utilising the synergistic properties of ultrasound guidance (UG), foam sclerotherapy (FS), and ambulatory phlebectomy (AP).
Methods: UGFP was performed as an adjunctive treatment for eliminating residual varicosities in patients having undergone earlier truncal ablation in a small prospective "proof of concept" trial study of 11 consecutive patients.
Standard clinical marking of varicosities was performed.
1.5% STS foam (3-10ml, 1:4 Tessari with 100% O2) was administered to the veins to be avulsed allowing the target varicosities to be readily identified on ultrasound. AP was first performed in the usual surgical manner. UG was then used to confirm completeness of vein removal and direct further placement of incisions and guide hook placement if residual varicosities were identified. The number of additional incisions directly related to UG was recorded.
Patients were reviewed clinically and with ultrasound at around 1 week (5-14 days) to determine success of treatment and exclude complications.
Results: All patients had additional incisions (2-4) that were a direct result of UG allowing for more complete removal of target veins than with "standard" phlebectomy. No complications were encountered at follow-up.
Conclusions: Early results suggest UGFP is safe and improves the effectiveness of vein clearance with AP. Understanding how this translates to patient outcomes over traditional AP would require a large randomized controlled study.

VENOUS THROMOBOEMBOLISM

Treatment of superficial vein thrombosis: update and current recommendations

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Background: Superficial Vein Thrombosis (SVTs) were for a long time considered to be a benign disease.
Recent studies have shown their potential seriousness. A concomitant deep vein thrombosis (DVT) was identified in 25 to 30% of patients at presentation, and a pulmonary embolism in 4 to 7% of patients. Subsequent VTEs were reported in 3 to 20% of patients.
Management has changed. Until recently, although numerous anticoagulant strategies had been tested, none had clearly demonstrated its clinical benefit. Recently, The Calisto study has validated a protocol based on fondaparinux 2.5 mg daily for 45 days, leading to update the recommendations.
Our objective is to present the rational and update of the management of SVT of the legs and the current recommendations and guidelines.
Methods: All patients with SVT should have bilateral duplex scanning:
- To assert the diagnosis of SVT;
- To determine the precise location and extent of the SVT;
- To diagnose or rule out the presence of DVT (25 - 30%).
(Level of evidence: high)
Treatment: On the basis of the data of the literature and in agreement with the last ACCP recommendations and the conclusions of the Cochrane review, it is logical to recommend, in patients with symptomatic SVT of at least 5 cm in length, the use of a prophylactic dose of fondaparinux or LMWH for 45 days over no anticoagulation (Grade 2B). Wherever the cost of treatment with fondaparinux is acceptable, we suggest fondaparinux 2.5 mg daily over a prophylactic dose of LMWH (Grade 2C).
Conclusions: However, the recommendations and guidelines are of a low grade. Some questions remain in the management of SVT. Some risk factors for subsequent development of VTE have been identified but further research is needed to clearly define subgroups of patients with a higher incidence of VTE after SVT.

Catheter directed thrombolysis in deep vein thrombosis, technique and results

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Background: Catheter Directed Thrombolysis In Deep Vein Thrombosis, Technique And Results.
Methods: Vascular Ultrasonography is diagnostic. Untreated it results in pulmonary embolism (PE), pulmonary hypertension(PAH) or Post thrombotic syndrome.(PTS)
In CATHETER DIRECTED THROMBOLYSIS (CDT) a Tissue Plasminogen Activator (TPA). (Urokinase, r-tpa) is delivered intra thrombus and effective thrombolysis achieved.
Retrospective analysis of 243 CASES OF DVT, treated with Urokinase was done. 150 M, 93 F, age 18 to 80 years. Symptoms 1 week to 4 months.168 cases with post procedure Warfarin and 75 of Rivaroxaban. USG guided puncture of Popliteal vein or PTV was done and sheath placed. Multi-hole catherter advanced intra thrombus. Thrombolysis done with urokinase 250000units/hr. Check fluoroscopy as required. Adjuvant heparin was given. Procedure terminated at complete resolution or a maximum of 1 million unit infusion.
Post procedure oral anticoagulant was given with INR set at 2.50.
New regimen: Post procedure Rivaroxaban: 15 mg/day for1 month and then 10 mg/day for two months. This helps resolve remote small thrombotic load. After 3 months aspirin 75 mg/ day started to last for 1 year.
A check USG was done in each case after 3 months and at 6 months.
Results: Complete Resolution: 206 Cases, Partial Resolution 33 Cases
Re-thrombosis: 2 Cases.
No Result: 2 cases
Follow-up: 8 yrs.: PTS 5, Secondary Varicose Veins: 02
Conclusions: TPA delivered intrathrombus gives optimum results in DVT, preserves valves and prevents PTS.
Addition of Rivaroxaban and omission of warfarin has changed the need to check INR and reduced the socio economic burden to the patient.

Percutaneous mechanical thrombectomy in the treatment of acute deep venous thrombosis

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Background: To evaluate the effectiveness of percutaneous mechanical thrombectomy in the treatment of acute deep venous thrombosis (DVT).
Methods: Twenty-six cases of acute deep venous thrombosis, which were diagnosed as iliofemoral venous thrombosis, were reviewed who had received percutaneous mechanical thrombectomy from March 2016 to January 2017 in Shanghai Renji Hospital, including 24 cases in left leg and 2 cases in right, male 11. Patient's age was from 27 to 82 years, average 57.5 ys. All cases received anticoagulation treatment for over 6 months after the procedure. Followed-up was from 6 to 13 months, average 10.4 ms.
Results: 23 cases (88.5%) were performed through controllateral common femoral vein. Technical success rate was 91.3%. Two cases were done through ipsilateral superficial femoral vein and one through popliteal vein. 23 cases co-existed with iliac vein suppression syndrome (IVSC). During these patients, 11 cases (11/23 47.8%) were treated by PTA, 12 cases (12/23 52.2%) by stenting, 10 cases (10/23 43.5%) by cathetered-direct thrombolysis simultaneously. There were 12 cases with complications, including 8 cases (30.8%) hemoglobinuria, 3 cases (11.5%) hemolytic jaundice, 1 case (3.8%) arrhythmia. Even so, all those complications were faded away in one to three days. Of all study follow-up, 3 cases (11.5%) with post-thrombotic syndrome.
Conclusions: Percutaneous mechanical thrombectomy is safe and effective in the treatment of acute deep venous thrombosis.

Flying and VTE risk in the context of superficial venous interventions

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Background: Varicose vein (VV) surgery is common practice worldwide, and, increasingly, day case, minimally invasive intervention. Despite this, there is an associated risk of venous thromboembolism (VTE), in the context of a condition that in itself represents a risk factor for VTE development.
Air-travel is also very common, and patients may even fly to their treating physician to undergo venous interventions. The association between VTE and flying has been well documented. What advice can therefore be given to patients undergoing VV surgery asking: "Doctor, when can I fly?"
Methods: A systematic review was performed, searching for articles

relevant to [(deep vein thrombosis) or (deep venous thrombosis) or (venous thromboembolism)] and [(flying) or (air travel)].
Results: The evidence regarding the effect of air travel on the coagulation system was highly heterogeneous. Flight time of >4 hours, window seating and immobility have been identified as risk factors for the development of VTE. VTE risk is increased in the 2-6 weeks following air travel. The majority of studies explored the relationship between general surgical or orthopaedic procedures and VTE risk. No studies assessed risk in patients who had undergone minimally invasive VV surgery.
Conclusions: There is a paucity of evidence regarding the risk of VTE and flying in the context of minimally invasive VV surgery. There is evidence that flying may increase the risk of VTE for up to 6 weeks following travel. Phlebologists should consider postponing VV intervention in the 6 weeks following long-haul travel, or consider interventions to mitigate VTE risk.

Antithrombotic practices following venous stenting: towards global expert consensus

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Background: Deep venous stenting is becoming increasingly used in the treatment of deep venous obstruction, however there is currently no consensus regarding post-procedural antithrombotic therapy. The aim of the present study is to determine the most commonly used antithrombotic regimes globally and facilitate expert consensus.
Methods: An electronic survey containing three clinical scenarios on venous stenting for May-Thurner syndrome, acute DVT, and post-thrombotic syndrome was distributed across four societies whose members included vascular surgeons, interventional radiologists and haematologists. The results of the initial survey (phase 1) were used to produce seven consensus statements, which were distributed in the second round (phase 2) to the respondents for evaluation. Consensus was defined as endorsement of a statement by more than 66% of the respondents.
Results: The phase 1 survey was completed by 106 experts, who practiced in 78 venous stenting centers in 28 countries. Sixty-one respondents (58% response rate) completed the phase 2 survey. Five out of seven statements met consensus criteria. Anticoagulation was a preferred treatment during the first 6-12 months following venous stenting for a compressive iliac vein lesion, while no agreement was reached regarding the role of long-term antiplatelet therapy. Low molecular weight heparin was the agent of choice during the first 2-6 weeks. Life-long anticoagulation was recommended after multiple DVTs, while discontinuation of anticoagulation after 6-12 months was advised following venous stenting for a single acute DVT.
Conclusions: This is the first study to achieve expert consensus on pertinent issues regarding the choice of antithrombotic regimes following venous stenting.

Treatment of severe acute deep venous thrombosis in lower extremity

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Background: To explore the method and effectiveness of treatment for severe acute deep venous thrombosis (DVT) in lower extremity.
Methods: Forty-nine patients with severe acute DVT treated in our hospital from January 1, 2002 to December 31, 2016 were retrospectively analysed. All the patients had limb edema and pain, 20 had limb cyanochroia, 5 had limb pallor, 10 had weakened dorsalis pedis artery pulsation, 14 had silent dorsalis pedis artery pulsation. Colour Doppler ultrasonography revealed DVT and superficial venous thrombosis in all diseased limbs. 22 patients underwent surgical thrombectomy, of which 3 were simple thrombectomy, 11 were supplemented with suprapubic saphenous vein bypass, 8 with suprapubic PTFE graft bypass. 27 patients underwent endovascular treatment, of which 8 with CDT thrombolysis, 19 patients with Angiojet thrombosis and iliac vein angioplasty plus stents.
Results: Limb edema relieved in 39 patients (79.6%), reduced in ten patients (20.4%). All diseased limbs regained normal artery pulsation and skin appearance. 46 patients (93.8%) were followed-up by a mean of 65 months. Limb edema disappeared in 30 patients (65.2%), reduced in 12 patients (26.1%), recurrent in 4 patients (8.7%). Among three recurrent patients, one died of malignant tumor 9 months after operation, three had their graft occluded resulting from intimal hyperplasia.
Conclusions: Surgical thrombectomy is an effective method for treating severe acute DVT in lower extremity.

Endovascular treatment of deep vein thrombosis and pulmonary thromboembolism

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Background: Around 50% of untreated deep vein thrombosis/ DVT/ cases are complicated by /Pulmonary Thromboembolism/ PTE. Submassive form of PTE presents with symptoms of respiratory and cardiac failure and require urgent and more radical treatment. The aim of this study is to identify the potential of endovascular therapy combined with local fibrinolysis in patients with DVT and submassive forms of PTE
Methods: 69 patients / 35 male and 34 females/with diagnosed DVT complicated with submassive form of PTE were treated successfully by endovascular methods.We established thrombosis of the iliac, femoral or popliteal vein in the DVT patients using EchoDoppler. PTE was diagnosed clinically and with CT pulmonary angiography. Pulmonary artery pressure was measured with echocardiography. The diagnosis was confirmed with conventional angiography.
Results: In all patients with confirmed diagnosis of PTE, endovascular treatment was performed – thrombus fragmentation and local fibrinolysis with t- plasminogen activator/TPA/. We found decrease in pulmonary pressure, partial or complete recanalization of embolism and clinical improvement. Patients were treated with new oral anticoagulants for a period of 6-12 months.
Conclusions: DVT complicated with submassive form of PTE can be treated successfully endovascular and with local fibrinolysis in the acute phase and with new oral anticoagulants in the chronic phase of the disease.

Endothermal heat induced thrombosis of great saphenous vein

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Background: The EHIT is a pathognomonic complication of thermal ablation. *Background:* to evaluate incidence, progression and risk factors.
Methods: *Study:* non-randomized,retrospective. *Period:* 5years. *Technique:* percutaneous,in ambulatory unit with local anesthesia and seda-

tion. *Materials:* 1470 nm diode laser,bare tip fibers. *Population:* 1063 GSV. Sample: 16 patients. *Method:* We measured the diameter of GSV at the SFJ, the reflux time,the distance from the tip of the fiber to the terminal valve and residual stump. Diagnosis and progression of EHIT: 3rd,7th and 30th day. Not simultaneous complementary treatment. We analized demographic data: sex, age and clinic severity. We indicated DVT prophylaxis according to risk factors and CT after EVLA.
Results: Incidence:
3rd day: 1.22%
Type1: (1050MMII)98.787%
Type2: (12MMII)1.128%,
Type3: (1MMII)0.09%
Type4: 0%
7th day: 1.51%
Type 1: (1047 MMII) 98.49% 3patient EHIT type2.
Type2: (15 MMII)1.41%
Type3: (1 MMII)0.09%
Type4: 0%
EHIT progression:
-15patients with EHIT2 resolved SS
-3patients with EHIT1 progressed to EHIT2.
DVT and TEP: not detected.
Comparation: G1:no EHIT *versus* G2:EHIT
-Average age: G1:53.70/G2:62.40 SS
-Sex: male G1:32/G2:56.25% SS
-Degree of reflux: severe G1:89/G2:87%.No SS.
-Diameter of GSV G2:116/G1:92mmSS
-Mean distance of the fiber tip:2 cm(1.8-2.3cm).NoSS
-Residual GSV stump: 2.3cm (1.4-3.3cm).NoSS.
Conclusions: Incidence of EHIT is low, early DUS determines increase the diagnosis rates and progression; Risk factors associated with increased rate:age,sex,vein size; Clinical severity,degree of reflux, position of the catheter tip, and length of stump were not a risk factor. We do not perform simultaneous complementary treatments,and perform DVT prophylaxis in all patients according to the risk, therefore these cannot be considered as bias. EHIT resolves in 1 month in most patients. EHIT is due to technical problems rather than a thrombotic tendency of the patient itself.

Tinzaparin for the treatment of superficial vein thrombosis of the lower limbs

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Background: The optimum duration of anticoagulation to treat superficial vein thrombosis (SVT) of the lower limbs has not been fully studied. The aim of our study is to investigate the optimum duration of treatment with tinzaparin in patients with lower limb superficial venous thrombosis.
Methods: Consecutive patients with SVT were treated with subcutaneous tinzaparin (Innohep™, LEOPharma A/S, Ballerup, Denmark). Those with thrombi measuring less than 5 cm on Duplex or reaching the saphenofemoral junction (last 3 cm of the great saphenous vein) were excluded. The composite primary endpoint of the study was recurrent thrombosis, defined as occurrence of clinically evident SVT recurrence, deep-vein thrombosis or pulmonary embolism. Patients were stratified into three groups by the duration of treatment: group 1 (≤30 days) and group 2 (31-60 days), which run in parallel and patients received mostly an intermediate or therapeutic dose and also a subsequent group 3 where patients received an intermediate dose (131iu/Kg) for 90 days. Duration of follow-up was 120 days after initiation of treatment.
Results: A total of 147 patients (101 females and 46 males) with a median age of 58.2 years were studied (group 1, N.=60, group 2, N.=38 and group 3, N.=49). Recurrent thrombosis occurred in 15/147 patients (10.2%), including 10 cases of recurrent SVT, four cases of deep-vein thrombosis and one case of pulmonary embolism. Recurrent thrombosis rates were significantly lower in group 3 (0%) compared to groups 1 (18.3%) and 2 (10.5%). Similar results were obtained for recurrent SVT only.
Conclusions: The incidence of recurrent thrombosis in patients with SVT of the lower limbs is high for the first three months and as a result treatment of shorter duration is inadequate. Future randomized trials should compare firstly the effectiveness of tinzaparin administered for the three-month risk period identified by our study against a 30-45 day regimen per current recommendations, and secondly the optimum dose of tinzaparin.

Tumor patients with PICC correlation between upper limb deep vein thrombosis risk factor analysis

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Background: To analyze risk factors for upper limb deep vein thrombosis of the tumor patients with PICC.
Methods: Collected the clinical data of 892 cases of tumor patients with PICC catheter and analysis, to explore the related factors of upper limb deep vein thrombosis.Using the method of single factor and multiple factors.
Results: 22 cases with upper limb vein thrombosis in the 892 cases, the incidence of 2.5%;Single factor analysis and multiple factor analysis are statistically significant factors for: catheter type, catheter related complications, prothrombin time, fibrinogen content ($P<0.05$);And sex, age, tumor type, merge disease, catheter vein catheter indwelling time, platelet count, prothrombin time, partial blood coagulation time live enzymes, D - dimer, chemotherapy drugs, chemotherapy reaction has no statistical significance ($P>0.05$).
Conclusions: Tumor patients with PICC catheter increase the risk of upper limb venous thrombosis, prior to the decision to patients with catheter, we must pay attention to assess the patient's blood coagulation index for catheter, choosing the appropriate catheter, and attaches great importance to the catheter after intervention and maintenance, in order to minimize the thrombosis caused by PICC.

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FORUM OF THE FOUNDERS

Are recurrent varicose veins after endovenous treatment or after surgery so different?

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Nowadays the term 'recurrent varicose veins' has been replaced by PREVAIT (= PREsence of VArices after Interventional Treatment). In patients with PREVAIT we have to differentiate between residual and recurrent varicose veins.
Residual varicosities depend on the pre-treatment distribution of varicose tributaries. Varicosities in direct connection with the refluxing trunk may tend to shrink after endovenous ablation (EVA) whereas other varicosities, related to other 'escape points' may persist. Such residual varicose veins may be treated after a certain interval by means of phlebectomies or foam sclerotherapy (FS). Surgery (consisting of high ligation and stripping) usually includes phlebectomies from the start, which means there should not be residual varicose veins immediately after well performed surgery. Hence the difference in residual varicose veins after both approaches mainly depends on the timing of the assessment.
Recurrent varicose veins re-appear at the same or at a different site of the previously treated truncal and tributary veins. Randomized clinical trials with long-term follow-up, of at least 5 years (so far mainly comparing endovenous laser ablation with surgery) have clearly shown there is absolutely no difference in the incidence of clinically obvious recurrent varicose veins (40 – 50%). This is also reflected by the lack of difference in the venous clinical severity score (VCSS) and the disease-specific quality of life scores, containing the presence of varicose veins as an item to be scored (*e.g.* AVVSS, HVVSS). On the contrary, what is clearly different is the duplex ultrasound (DUS) appearance, with different DUS patterns of recurrence after EVA compared to those after surgery:
- At the saphenofemoral junction (SFJ) recurrent reflux may be observed: after surgery of the great saphenous vein (GSV) neovascularization is more frequently seen, whereas after EVA refluxing SFJ tributaries appear to be more frequent. This results in a significantly higher rate of recurrent varicose veins originating from the SFJ region after EVA than after surgery. A typical anatomic pathway of recurrence after EVA is (persistent or recurrent) reflux at the SFJ and anterior accessory saphenous vein (AASV), reported in 20 to 40% of treated limbs.
- At the level of the treated trunk segmental or complete recanalization may occur after initial successful obliteration in 5 – 15% of treated truncal veins. This is obviously not the case after successful stripping of the target vein, although so called 'revascularization of the strip track' may occur and result in clinical recurrence.
- Perforating veins may also play a role in recurrence, although the available literature is conflicting and it cannot be concluded whether their incidence and role in recurrence is different between surgery and EVA.
Finally, new sites of reflux may be due to progression of the disease resulting in clinical recurrence, both after EVA and after surgery.

Ultrasound examination of recurrent varicose veins

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Varicose vein treatment (VVT) may result in a variable recurrence rate (up to 50% at 5 years after surgery). Duplex-based recurrence rate is usually higher than the clinical one, as many refluxing veins may not be clinically relevant. Colour-duplex ultrasound (CDU) highlights different morpho-hemodynamic patterns related to recurrence after surgery or endovenous thermal/chemical ablation. Adequate settings (*e.g.* low PRF) and operator's skill objectively influence accuracy of CDU investigation. A few of the possible causes of recurrence are: progression of the disease with newly formed (refluxing or not) varices in the treated limb or pelvic refluxes, (neo)vascularization in the groin/popliteal areas or in the saphenous compartments, technical and tactical mistakes with residual refluxing veins, subsiding deep vein abnormality.
CDU after VVT is aimed at detecting any new or persistent source of reflux from residual saphenous junction stump, inguinal or popliteal varicose network, accessory saphenous vein, perforators (up to 75.8% of new incompetent perforators in Van Rij's experience), non saphenous veins (*e.g.* pelvic, perineal, gluteal, sciatic nerve varices). In a few cases recurrent refluxes are not associated to any escape points from deep veins. CDU-based follow-up has a 100% predictive value for clinical recurrence at 5 years as reported by M.De Maeseneer.
Post-surgery recurrence may differ from post-endovenous ablation recurrence, as the latter presents a much lower groin/popliteal neovascularization rate (typical of surgery) and possibly a degree of recanalization of the treated stem. Different morphologic and hemodynamic findings are highlighted after thermal or chemical ablation as to the treated trunk/s: obliteration (visible or invisible), partial patency, complete patency, residual lumen, length of the patent tract; no flow, antegrade/retrograde flow, reflux duration.
After VVT the combination of CDU investigation with clinical assessment (symptoms in primis) represents the best approach to follow-up and possibly suggest an adequate re-treatment.

ULCERS AND WOUNDCARE

What improvements in patient treatment have arisen from research into the cause of venous ulceration?

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A great deal has been discovered about the causes of venous leg ulceration during the last 100 years. It used to be thought that 'venous stasis' *i.e.* lack of blood flow was the cause of leg ulceration. However, it has been shown that in patients with lipodermatosclerosis, increased blood flow is present in the limb and in the skin. It has been clear for many years that raised venous pressure in superficial veins is the physiological abnormality leading to the development of leg ulceration.
In 1988, my colleagues and I proposed a 'white cell trapping' hypothesis which sought to explain our observations that leucocytes were 'trapped' in the lower limbs during periods of venous hypertension. We thought that this might cause occlusion of capillaries leading to hypoxia of the skin. In fact, we were never able to show that skin hypoxia was present and discovered that many inflammatory process were at work in the skin in our patients with venous disease. These have been elucidated in much greater detail by subsequent authors.
It would be reassuring to know that these advances in knowledge have led to improved patient outcomes. However, the use of drug treatment in patients with leg ulceration has shown modest efficacy with a very limited number of drugs. There has been no dramatic improvement in leg ulcer healing. In the interim, much better ways of treating varicose veins have been developed and these appear to be of great benefit in many leg ulcer patients.
Patients with leg ulceration often have similar impairment of venous function compared to those without leg ulceration. The reasons why some patients develop leg ulcers are still not well understood. Further elucidation of this conundrum may lead to the development of better pharmacological treatments for venous ulceration.

Venous leg ulcers can be markedly reduced in a population by establishing care pathways and early performed venous surgery

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Background: To assess the effectiveness of management changes performed following the initial series of studies 1988-1992, based on repeated assessments regarding number of patients and aetiology spectrum changes over time. We wanted to see if the generally expected increase of patients with lower limb ulceration could be prevented by performed management changes.
Methods: In Skaraborg county with a population of around 250 000 a unique series of cross-sectional epidemiological studies have been undertaken between 1988 and 2014. Large samples of identified patients have been assessed, in detail regarding history, clinical appearance and regarding causes of ulceration. The major measures for improving management quality were, creation of treatment guidelines and care pathways, easily available venous CDU and early use of vascular surgical intervention for venous and arterial ulceration. The outcomes based on patients in contact with the health care system were compared for 1988, 2002 and 2014.
Results: Despite having an older population and and substantially more patients with diabetes today the point prevalence of open ulceration has decreased by 37% since 1988. The most marked projected reduction was noted for venous ulcers 71%, from 429 patients in 1988 down to 125 patients in 2014. Venous ulcers have been reduced from being the dominating aetiological factor into just one of five major aetiologies of more equal size in 2014. Our management strategy has been successful and we have been able to substantially decrease lower limb ulceration within our population, despite the generally expected scenario with increasing number of ulcer patients.
Conclusions: You can reduce lower limb ulceration and especially venous ulceration substantially by structured multidisciplinary management. We believe that early diagnosis and referrals of patients for specialist assessments and especially vascular surgical interventions may have been most important. Early performed correct diagnosis and interventions are essential parts for reproducing these results elsewhere, which ought to be feasible worldwide.

Effects of adipose-derived stem cells treatment in recalcitrant chronic leg ulcers: a phase 2 randomized control trial

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Background: Adipose tissue has been described as a source of different types of stem cells (ASCs). Preclinical studies on ASCs gave rise to an exponential increase in data, and observational reports seems to indicate ASCs as a safe and promising tool to treat non healing venous leg ulcer (VLU). However standardized protocol for cells treatment as well as randomized clinical studies are currently lacking.
Methods: From an initial cohort of 38 patients, 8 patients (5 men, 3 women) affected by non healing VLU were randomized respectively to gold standard treatment (control arm) and to gold standard treatment plus ASCs (experimental arm). Synchronously we investigated the functional and the immunophenotypical features of the harvested stem cells. The primary outcome measures were the healing time and the safety of the cell treatment. Secondary outcomes were: pain evaluated by NRS; the complete wound healing at 24 weeks; the Margolis Index (MI = the percentage change in area of an ulcer over the first 4 weeks of treatment). Finally, the lab parameters of ASCs expansion and cytometric analysis were correlated with the clinical outcomes.
Results: No relevant adverse events followed to cell treatment. The healing time was significantly faster by applying ASCs, 17.5±7.0 weeks in the experimental arm *vs.* 24.5±4.9 weeks recorded in the control group ($P<0.036$). NRS dropped after the first week to 2.7±2.0 in the experimental arm *vs.* 6.6±3.0, in the control group ($P<0.01$). MI and the rate of healing at 24th week was not significantly different between arms. Very interestingly we found a strong reverse correlation between the % of CD34+/CD45- respectively with the healing time ($r=-0.894$, $P<0.041$) and NRS ($r=-0.934$, $P<0.020$).
Conclusions: ASCs is safe and may accelerate the healing time in VLU as well as reduce the wound pain. % of CD34+/CD45- is a lab parameter predictive of successful ASCs treatment.

Incidence of asymptomatic occlusive iliac vein lesions in C5 and C6 disease and their predictive value for ulcer healing

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Background: To study the incidence of asymptomatic iliac vein occlusive lesions in patients with C5 and C6 C6 disease.
Methods: The study was approved by the Institutional Review Board and the Ethics committee. It is a prospective study done from July 2015

to June 2016. All patients who were admitted for endovenous ablation of the superficial vein and had C stage 5 and 6 disease were included in the study after an informed consent. Patients underwent ascending venogram through a femoral vein cannulation via GSV puncture at the commencement of endovenous ablation. The findings considered abnormal on venogram were presence of collaterals, splaying of veins, reflux of contrast into the internal iliac vein, narrowing of the veins compared to the adjacent normal vein or contra lateral normal side and presence of occlusion. The patients were reviewed at 12 weeks to assess for wound healing. Analysis was done to correlate the rate of wound healing in patients with positive findings venogram.
Results: Total number of 104 patients were included in the study. There were 94 males and 10 females. 70 patients had symptoms on the left leg and 34 patients on the right leg. There were 33 patients with healed ulcer and 71 patients with active ulcer. 66% of patients with active ulcers and 70% of patients with healed ulcers had positive venogram findings. On follow-up at 12 weeks, among patients with persistent ulcers 90% had abnormal findings on the venogram, while patients who had healed ulcers only 40% had abnormal venogram. The difference was statistically significant.
Conclusions: The incidence of non-occlusive iliac vein pathology as indicated by an abnormal venogram is high in patients with advanced chronic venous insufficiency. The ulcers of patients with abnormal venogram are less likely to heal at 12 weeks duration. Ascending venogram is a valuable and cost effective investigation for patients undergoing endovenous ablation for C5 and C6 disease.

Breaking paradigms: a new theory on genesis of the venous ulcer. Pre-eliminary report

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Background: Venous ulcer has been considered traditionally as the main sequel to chronic venous insufficiency. Is considered to be caused by an increase in distal venous pressure, hence therapy is directed to reduce these pressure, either with inelastic bandages, special stockings, surgery and others. There are some reports that relate the ulcers and the angle of ankle flexion, since the main mechanism of venous return is the muscular pump of the calf and if this pump does not work properly the blood return will not be effective.
Methods: We designed a test to verify the limitation of dorsiflexion, which consists of placing the patient standing and without swinging back or folding the trunk, ask him to lift the tips of the feet, if he can´t or if they are less than 10 degrees the maneuver is positive to short gastrocnemius syndrome, between 10-20 degrees is moderate and if he can lift them without difficulties (+ 20 degrees) is negative. All the patients with venous ulcer and positive test were include. Doppler USG and measures of diameters and velocity were made in great saphena, popliteal and femoral veins before and after. We perform a proximal release of the medial twin by mini-surgery in all cases. Study approvedby the Ethics Committee.
Results: Initial results are very encouraging, venous ulcers closed within 1 to 4 weeks after the procedure, gait improved considerably as well as the dorsiflexion angles of the foot, making negative the test. The study has not yet been completed. We present some cases to exemplify the exposed theory.
Conclusions: The venous return is mainly performed by the plantar pump and the calf muscle pump, until now the importance of the function of the involved muscles has not been emphasized, however our observations show a preponderant role in the venous physiology of the twin and other muscles involved in the biomechanics of gait. Described observations show that even the future treatment of venous insufficiency may not be the elimination of the saphenous vein, but rather a good hygiene in the biomechanics of gait. We still need to go further in this kind of studies but this new theory about venous insufficiency would be a breaking point in the concepts of phlebology.

EVRA (Early Venous Reflux Ablation) ulcer trial: baseline characteristics & event rates

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Background: The timing of offering superficial venous intervention to patients, in terms of its effect on leg ulcer healing is controversial. We present a trial designed to clarify the issue.
Methods: Patients were randomized to either early endovenous treatment of superficial venous reflux in addition to standard care compared to standard care alone. All patients were seen in an out-patient clinic at 6 weeks (with a duplex taken in the early group), in addition to monthly telephone follow-ups plus weekly ulcer healing verification visits are performed upon notification of healing. Quality of life is measured at several time points. The trial closed to recruitment on 30th September 2016.
Results: 6555 patients (51% men; 49% women, mean age 72) were screened, with 450 patients randomized (7% inclusion rate; 56% men; 44%women, mean age 68). 27% of patients screened were ineligible with respect to ulcer duration. The median baseline ulcer duration is 3.1 months and the median size was 3.0cm^2. Venous incompetence pattern were: 56% GSV incompetence alone, 13% SSV incompetence alone and 25% both GSV and SSV incompetence combined; 27% had evidence of deep venous incompetence. The interventional treatment strategy employed was 53% with foam alone, 26% with endothermal ablation alone and 20% by a combination of therapies. To date a total of 356 (81%) ulcers have healed within 12 months.
Conclusions: This study will be the first large randomized multicenter trial to report on the clinical, quality of life and cost effectiveness of treating patients with venous ulcers by early superficial venous intervention.

Surgical treatment of chronic venous leg ulceration results from Paraguay

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Background: chronic venous insufficiency is the main cause of the apparition of the leg ulcer, The treatment of venous leg ulcers is a common and sometimes difficult problem. They can be costly to treat and are associated with loss of working capacity and sometimes significant morbidity. We present here the results of surgical treatment in our surgical service in the university hospital of Asuncion, Paraguay.
Methods: Seventy consecutive patients with 86 venous leg ulcers underwent history, clinical and color doppler examination (Sonosite titan7.5/10 MHz probe,). The contour of the ulcer was traced on transparent dressing and area of ulceration calculated In patients with bilateral ulcers, each leg was considered separately. If multiple ulcers were pre-

sent on the same limb their areas were summated. Exclusion criteria comprised age >80 years, patient unable to walk, peripheral arterial disease and/or an ankle brachial index <0.9. The study group therefore comprises 86 ulcerated limbs in 45 female, 25 female, mean age 63 patients with primary sapheno-femoral and/or popliteal junction (SFJ, SPJ) and long and/or the short saphenous vein (LSV, SSV) disease. Patients were randomized and followed for 3 years. Written informed consent and ethical committee approval was obtained.
Results: Patients with reflux at the saphenofemoral junction or long saphenous vein were offered saphenofemoral junction disconnection, stripping of the long saphenous vein to below the knee, and calf varicosity avulsions. Venous reflux in the short saphenous vein was treated with saphenopopliteal junction disconnection and calf varicosity avulsions. We treated patients who were considered unfit for general anaesthesia,under local anesthesia and all the patients complete the closure of the ulcer after 4 weeks of surgical treatment no major or minor complication was seen at our surgical group. After the third year of follow-up only 4 of the seventy cases has recurrence with the ulcer.
Conclusions: Surgical correction of superficial venous reflux plus compression bandaging reduces the recurrence rate after three years of follow-up of our study instead of only bandaging alone for ulcer treatment

Ultrasound-guided foam sclerotherapy in the treatment of venous leg ulcers

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Background: Compression therapy remains the treatment of choice of the venous leg ulcer (VLU), but in some patients, the ulcers refractory to the standard conservative treatment are observed.
The aim was to determine ulcer healing and recurrence rate in the patients with chronic VLU undergoing ultrasound-guided foam sclerotherapy (UGFS) in addition to the standard compression.
Methods: 76 patients underwent UGFS for superficial vein incompetence in addition to compression for the treatment of VLU refractory to the standard compression and local therapy. An obtained database was analyzed to determine venous occlusion rates, 24-week and 12-month healing rate (HR) and recurrence rate (RR).
Results: 26/76 patients (34,21%) required more than one session of treatment for complete occlusion of great or small saphenous vein, incompetent perforators and varicosities. The 3 and 6 months healing rates were 67,1% and 92,1%, respectively. The patients with isolated axial reflux had higher healing rate than those with axial and perforator incompetence or those with isolated perforator incompetence. The median healing time was 3,37 months (IQR 1-15 months). The estimated 12-month recurrence rate was 3,9%. The ulcer duration, large initial ulcer area, history of previous ulcers and deep vein thrombosis and previous surgical treatment of varicose veins had an influence on HR and RR.
Conclusions: UGFS appears to be an attractive minimally invasive technique to treat superficial vein reflux in patients with VLU and is associated with high HR and low mid-term VLU RR.

Assessing hemodynamic and ceap classification in 276 patients with venous leg ulcers in Ecuador: a case series

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Background: Varicose veins are categorized according to severity in the Clinical, Ethiological, Anatomical and Pathophysiological (CEAP) classification for chronic venous disease. Healed and active ulcers are classified as C5 and C6. Obstruction associated with the incompetence of deep veins is a factor that contributes active ulceration and incompetent perforating veins (IPVs) are a causal factor. To examine the hemodynamic pattern associated with the clinical (C) and anatomical (A) classes of CEAP in a population of patients examined in missions in Ecuador in 2014-2016.
Methods: The ultrasound examination with venous mapping was performed to detect venous shunts and subtypes in 276 consecutive patients. We examined 311 lower limbs in 72 males and 200 females aged 7-90 years (mean 56.8, 241 mono and 35 bilateral). We recorded C(1-6) and A (As1-5, D6-16, P17-18) CEAP classes including main and the secondary shunts and the number of IPVs.
Results: 64.9% of lower limbs were in C2 class, while C3 to C6 classes were present in a small number of cases (8.1% were C5 (5.4%) and C6 (2.7%)). C1 and C2 were associated with S1-5 superficial classes and 26% of C2 had IPVs. Shunts were totally absent in the C0 class. Open shunts were found in C2, while all limbs with C ≥C4b showed at least one shunt. Open shunts were more frequent in lower C classes and closed shunts in the higher C classes. In C1 the saphenous-femoral and the popliteal junctions were never involved. In almost 50% of the limbs in C2 class, one of the junctions or an intra-saphenous perforator was incompetent.
Conclusions: The total absence of shunts in C0 to the greater rate of closed shunts in higher clinical classes suggest shunts are related to the severity of CVD. Venous ulcers (C5 or C6) should have a closed shunt, which can be disconnected surgically. As an example of exclusion, C1 patients deserve less invasive procedures, owing to the competence of junctions. These findings have important clinical practice implications to healing outcomes.

Effects of adipose-derived stem cells treatment in chronic leg ulcers. A phase II randomized clinical trial

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Background: Adipose tissue is a source of different type of stem cells (ASCs). We investigated safety and effects of ASCs in a phase II randomized clinical trial, in the field of recalcitrant venous leg ulcer (VLU). In addition we evaluated a reproducible methodological approach to standardize the isolation, characterization and the clinical use of the ASCs for ulcer wound healing. Finally, the biological data were correlated with the clinical follow-up of the patients after treatment.
Methods: Sixteen (16) patients affected by chronic venous leg ulcers were randomized. ASCs were harvested using Coleman's technique and injected into the ulcers. We assessed also: healing time, post-treatment pain with numerical scale (NRS), Margolis Index (MI), and patients healed into 28 weeks. In laboratory a sample of the same cells was processed in order to characterize the amount and the type of stem cell. The in vitro clonogenic output was evaluated as colony forming unit fibroblasts (CFU-F).
Results: The patients treated with ASCs heal in a minor time, 17.5±7.0 weeks *vs.* 24.5±4.9 (P<0.036). The clinical course was less painful in ASCs arm 2.7±2.0 *vs.* 6.6±3.0 (P<0.01). The MI was positive in 50% of patients *vs.* 25% of controls (P<0.3). High number of CD34+/CD45- stem cells was observed (mean of 82.6±16) and supra adventitial component and pericytes are the most represented. Laboratory results also show a linear correlation between MI respectively with the number of CFU-F (r=0.94), the number of pericytes (P=0.98).
Conclusions: The experimented procedure demonstrated to be safe as well as, by using the standard methods herein assessed in the lab, also significant clinical benefits. This study encourages to plan a wider phase III trial.

ENDOVENOUS INTERVENTIONS AND SURGERY

Randomized controlled trial comparing mechanochemical ablation to radiofrequency ablation: the multicenter venefit *versus* Clarivein® for varicose veins (VVCVV) Trial. Long-term follow-up

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Background: Endothermal ablation methods require tumescent anaesthesia, which can be uncomfortable during administration. Non-tumescent non-thermal techniques would therefore have potential benefits. This randomized controlled trial was carried out to compare the degree of pain patients experience while receiving mechanochemical ablation (MOCA) or radiofrequency ablation (RFA). The 6 months clinical outcomes have been reported previously and the longer-term follow-up is being presented here.
Methods: Patients attending for primary varicose vein treatment were randomized to receive MOCA (ClariVein®) or RFA (Covidien® Venefit™). The most symptomatic limb was randomized. The primary outcome measure was intra-procedural pain using a validated visual analogue scale. Secondary outcome measures were change in quality of life and clinical scores, time to return to normal activities as well as the occlusion rate.
Results: One hundred and seventy patients were randomized (51% to the MOCA group). Baseline characteristics, including demographics, CEAP classification, clinical scores and quality of life (QoL) scores were similar. The maximum pain score was significantly lower in the MOCA group (24.3mm) compared to the RFA group (34.8mm; P=0.005). Average pain score was, however, similar in the MOCA group (17.8mm) and the RFA group (24.0mm; P=0.053). Seventy-one percent of the patients attended follow-up at 6 months and 21% attended at more than 2 years. The VCSS score at 6 months was 2.5 for MOCA and 2.7 for RFA (P=0.57), with the corresponding figures at longer than 2 years being 2.3 for MOCA and 1.6 for RFA (P=0.29). The time to return to normal activities was again comparable between the two groups. The complete or proximal occlusion rate at 6 month was 87.1% for the MOCA group and 93.2% for the RFA group (P=0.483). At more than 2 years, the complete occlusion rate was 77% for MOCA and 100% for RFA (P=0.175).
Conclusions: The results show that MOCA is less painful than RFA procedure. However, at more than 2 years follow-up, the clinical and specific quality of life scores showed similar improvement in both treatment groups. The occlusion rate was reduced with MOCA compared to RFA, but this did not reach significance.

Randomized controlled study of the efficacy of endovenous laser treatment *versus* ultrasound-guided polidocanol foam sclerotherapy in small saphenous vein incompetence: one-year follow-up results

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Background: During 3 years, to compare the evolution of the reflux >0.5s and closure rate of the small saphenous vein (SSV), the venous clinical severity score (VCSS) and the quality of life (QOL) of the patients (CIVIC-14) into two groups of randomized patients: one group being treated on D0 by endovenous laser (EVL) and the other by ultrasound-guided foam sclerotherapy (USGFS).
Methods: open randomized prospective clinical trial on two parallel arms. Inclusion criteria: SSV incompetence (trunk reflux>0.5sec), CEAP C2 to C6. Evaluation criteria: venous Duplex-scan assessment, VCSS, CIVIC-14; visits on D0, M6, M12, M24 and M36.
Results: the study covers 144 patients among whom 70 were treated by EVL and 74 by USGFS. Both groups were homogenous (75% female, mean age 58), with equivalent mean trunk diameters (6mm at mid-calf) and a majority of C2s (51%). At M6, rate of reflux>0.5sec was 4% in EVL-group *vs.* 21% in USGFS-group (P<0.01) and at M12, 3% *vs.* 33% (P<0.001) respectively. A total venous closure was observed in 94% for EVL-group *vs.* 72% for USGFS-group (P<0.01) at M6 and in 97% *vs.* 62% (P<0.001) at M12 with equivalent length of occlusion (20 and 23cm). At M6, 75% were asymptomatic in EVL-group and 72% in USGFS-group (P:NS) and this rates increases to 86% and 83% at M12 (P:NS). The VCSS was highly improved (P<0.001) in both groups with no difference between them from 6.7 at D0 to 1.4 at M12 in the EVL-group *vs.* 5.9 to 1.7 in the USGFS-group. The benefit was gained between D0 and M6 and is maintained between M6 and M12. It was the same for the QOL: 21.4 to 4 in the EVL-group *vs.* 20.9 to 7.4 in the USGFS-group.
Conclusions: the reflux is more frequent in the USGFS-group at M6 and M12 and the closure rate is lower than in the EVL-group. By cons, the rate of asymptomatic patients, the VCSS and the QOL are significantly and similarly improved in both groups.

Open surgery still durable for varicose vein treatment: a one year prospective audit with long term follow-up

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Background: With the introduction of endovenous treatments for varicose veins open surgery was discarded due to the high risk of neovascularization. We found the risks overestimated and set out to perform a one year audit to look at our own results from performing mainly open surgery.
Methods: From Sept. 2009 until August 2010 all varicose vein interventions were registered and prospectively followed with colour Duplex assessments after 4-6 months, 1 and 5 years. In addition Aberdeen Varicose Vein questionnaire (AVVQ) was used in addition to Varicose Vein Severity Score (VCSS) to assess patients' quality of life (QoL) and the disease severity (assessed pre-op and after 1 and 5 years). Duplex assessments were done by vascular technologists not involved in the audit but trained to detect neovascularization.
Results: During the year 236patients/252 legs were operated and 28% were re-do procedures. Great saphenous vein (GSV) surgery dominated among primary procedures (82%). Re-do procedures took 7 minutes longer to perform (55 *vs.* 48 minutes) P<0.005. Median age was 55 years (16-87) and 70% were females. Duplex at 4-6 weeks showed good result for 91%. After one year 86% had a good result and neovascularization was noted in 8% after primary surgery. The long term assessment was done after 69 months (39-75) and 67% of all legs was examined. The result was remaining good for 70% and 16% neovascularization was shown after primary surgery and 27% after re-do procedures. VCSS improved significantly from 6 (range 1-22) to 1 after one year and 2 long term (P<0.001). AVVQ scores improved from 20 (range 3-55) down to 9 and 10 respectively (P<0.001). For primary surgery AVVQ remained unchanged between 1 and 5 years whilst for re-do procedures the score deteriorated significantly between 1 and 5 years.

Conclusions: The risk for neovascularization seems to have been overestimated and good long term results can be achieved following open modern surgery. The major problem is to avoid varicose vein recurrence since our results from re-do procedures seem less favourable long term. Currently there is no optimal technique since all contributes to varicose vein recurrence.

Randomized Controlled Trial Of Compression Therapy Following Endothermal Ablation

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Background: Since the turn of the century, endovenous ablation has rapidly progressed to become the main treatment method for varicose veins. It has been demonstrated to be highly effective clinically and to improve the quality of life of patients. There is, however, uncertainty regarding the management post-intervention, especially in terms of post-operative compression. Hence, a randomized study was undertaken to investigate the effects of wearing compression stockings following varicose vein treatment.
Methods: Patients with saphenous vein reflux and undergoing treatment with endothermal ablation were randomized to receive either 7 days of compression stockings or no stockings. The primary outcome measure was the pain score over the first 10 post-operative days. The pain scores, clinical score and time to return to normal activities at 2 weeks and 6 months were assessed, but only the interim results at 2 weeks are presented below.
Results: In total, 134 patients have been randomized, 48.5% of them to the compression group. The mean age was 50 (±16) years and approximately 49% of the population was male. Sixty-five percent of the population attended the 2-week follow-up.
The mean daily pain score in the compression group using a visual analogue scale (VAS) was significantly lower at 20.6 (±18) mm, compared to 32.3 (±26) mm in the no compression group (P=0.019). Significantly better pain scores were also noted in the compression group on days 1 to 5 compared to the no compression group.
The clinical scores in both the compression and no compression groups show improvement with a mean improvement in VCSS of 1.61±2.4 in the compression group compared to 1.98±2.2 in the no compression group (P=0.484).
The time to return to normal activities was a median of 2 days in both groups, while the median time to return to work was 3 days in the compression group compared to 5 days in the no compression group (P=0.263).
Conclusions: These interim results indicate that wearing compression stockings following endothermal ablation is advantageous in the first few days following treatment. However, this is not translated in notable clinical differences at two weeks or in the time to resume usual activities.

A clinical trial manager in a multicenter randomized controlled trial

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Background: Clinical trials are a key component of determining optimal medical practise. While numerous individuals are involved in the process, the trial manager's role is key to a successful outcome. This talk will present the key tasks of a trial manager.
Methods: The trial manager performs a variety of roles from the design of the trial at the grant application stage to ensure feasibility and sufficient patient and public involvement, to optimising and enhancing recruitment to ensure that the project runs to time within the budget, to designing the data collection forms and database and cleaning the data in preparation for the analysis. The trial manager is also responsible for writing the study protocol and designing the associated documentation, training and mentoring the research nurses and local Principal Investigators, ensuring they adhere to the principles of Good Clinical Practice. They also ensure that the Chief Investigator is kept well informed and are the link between the various committees that oversee the safety and integrity of the trial.
Results: It is advantageous if the TM comes from a strong scientific/analytical background, and can work well independently and communicate well with others. They are also required to be highly organized with excellent attention to detail and problem solving abilities. The position goes far beyond an administrative support role and involves strategic management and leadership skills to ensure the success of the study.
Conclusions: In conclusion, the trial manager plays an integral and multifaceted role from the conception to completion of clinical trials in an academic setting.

A comparative analysis of the results of cyanoacrylate ablation and radiofrequency ablation in the treatment of venous insufficiency

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Background: Varicose vein treatment has been directed toward less-invasive yet lasting techniques. The present study was designed to compare the effectiveness of cyanoacrylate ablation (CAA) with that of radiofrequency ablation (RFA).
Methods: The study included 524 and 202 patients who had undergone RFA (ClosureFast Medtronic, San Jose, CA, USA) and CAA (Variclose vein sealing system Biolas Ankara), respectively, within the previous 4 years. The mean ageof the patients was 48.4±11.3, and the mean follow-up time was 12.3±6.2 months. Preoperative and postoperative CEAP class, symptoms, recurrence, and Doppler findings of the two groups were compared.
Results: Postoperative Doppler saphenous vein closure rates were 97.3% in the RFA group and 98.7% in the CAA group. The type of operation had no effect on postoperative symptoms, CEAP or Doppler findings. There is no efficiency difference between treatment methods. The predictors of postoperative CEAP class were preoperative CEAP class, bilateral limb disease and prior deep vein thrombosis (DVT), whereas the predictors of symptom recurrence were postoperative perforator incompetence (PI) and preoperative CEAP class. The four-year symptom-free survival rates were asymptomatic rate was 66.3% in the RFA group and 61.9% in the CAA group.
Conclusions: The major disadvantages of current thermal ablation techniques, such as postoperative pain and discomfort as well as skin bruises, paresthesia and burns caused by thermal damage and the need for tumescent anesthesia caused an increasing need for the develoğment of non-thermal, non-tumescent options for shorter and more succesfull treatment of venous insufficiency. The CAA seems to be the closest technique to the ideal and suıtable for all patients, since it is non-thermal and non-tumescent. The results are satisfactory and are comparable to the RFA. When two techniques are evaluated, CAA may be preferable as a simple application in a shorter time with less early postoperative discomfort. However, still long-term results and cost analyses of larger series need to be documented.

A single center randomized controlled trial comparing radiofrequency and mechanical occlusion chemically assisted ablation of varicose veins in patients with bilateral involvement: initial experience

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Background: New non-thermal techniques such as mechanical occlusion chemically assisted endovenous ablation (MOCA) and Glue injections allow treatment of entire trunks with single anaesthetic injections. Previous non-randomized work has shown reduced pain post-operatively with these techniques. But the difference in pain perception of the same technique can vary between the patients a lot especially younger patient and patients with higher economic strata having more pain. To eliminate this bias we conducted a study between MOCA and RF ablation in patients with bilateral varicose veins with six months' follow-up.
Methods: Patients with bilateral varicose veins underwent both MOCA and RFA under LA. Pain scores using Visual Analogue Scale were recorded. Patients were reviewed at one and six months with clinical scores, quality of life scores and duplex assessment.
Results: 20 patients were recruited over a 3-month. Patients in the MOCA group experienced less pain during the procedure Postoperative pain scores were similar in both groups. Occlusion rates, clinical severity scores, disease specific and generic quality of life scores were similar between groups at one and six months. The duration of the procedure was significantly less in MOCA group.
Conclusions: Pain secondary to truncal ablation is less painful with MOCA than RFA intraoperatively but similar in postoperative period. They have similar short-term technical, quality of life and safety outcomes.

Cryostripping as an alternative to endovascular approaches in the treatment of varicose veins

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Background: The presentation of cryostriping as an effective and cheap therapeutic method that we used in the cure of varicose veins.
Methods: This technique represents the modern alternative of saphenectomy through striping procedure. It is done with the help of a special freezing probe introduced retrograde in the saphena magna or parva vein after performing the crosectomy by miniapproach. By freezing the vein with nitrogen up to -85°C the vein adheres to the probe and therefore it can be extracted.
Results: We introduced the method in September 09, 2013 and performed over 800 operations with good results. This procedure presents the advantage that through the vein ablation the risk of repermeabilization and recurrence dissapears.There is minimum tisular trauma, therefore it can be used at the patients with phlebo- lymphoedema of the lower limbs avoiding the posoperative cutaneous paresthesias through intercepting the saphenous nerve. From the economical point of view this method is very affordable due to the fact that the freezing probes can be resterilized. The patient can undergo this procedure in the surgical ambulatory conditions having a faster reinegration.
Conclusions: We consider the cryostriping a very valuable procedure that perfectly respects all the principles of the venous surgery.

Varicose vein worldwide trends in public digital interest

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Background: Varicose veins (VV) affect >30% of the population, globally VV treatment in 2024 is expected to cost 475,000,000USD. Technological advancements, growth in healthcare expenditure and population factors increasing the incidence of venous disease are driving the VV procedure market. The Internet has become a source of health-care information used by patients and physicians to research symptoms, diagnosis and treatments. Google is the most popular search engine for online health-related information. This study aimed to evaluate worldwide trends in patient VV research and treatment, using Google search behavior as a proxy.
Methods: Data from Google Trends on the worldwide topic VV over the last 10 years was analysed to identify changes in population search activity and thus interest in VV symptoms, recurrence and treatment. Sub-analysis by region was also performed.
Results: Interest in VV worldwide steadily increased by greater than 35%. Commonly associated search terms were surgery (75%), pregnancy (80%), pain (60%), alternative and non-operative treatments (10-20%) and laser (40%). An interest spike occurred May 2008 coinciding with an increase in VV medical literature publication. Search behavior exhibited a regular, cyclic pattern that was seasonal – higher in summer months, lower in winter. The most rapid increase has been in non-English searches for VV.
Conclusions: VV digital interest is consistent worldwide and increasing, particularly in developing countries. Cyclical interest is season related. While overall interest is steadily rising, traditional surgery remains the most commonly searched treatment choice, with interest in newer treatment techniques remaining stable.

Aesthetic ambulatory surgical therapy of the varicose veins: a 20-year experience

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Background: The aim of this paper is to present a particular ambulatory minimally invasive surgical method of treatment of the varicose veins. VANST (Varices' Ambulatory Non-stripping Surgical Therapy) is a procedure of taking the varicose veins out of the circuit through the interception of the channels of their filling up. Our experience in practicing this method is of over 13000 procedures
Methods:
1. The marking on the skin of the places of the future incisions.
2. Steps of the intervention: - local anesthesia with 1% lidocaine (10-20 ml.) - incisions of 1-5 mm. - the varicose veins are intercepted, sectioned and ligated; the same procedure is applied for the insufficient perforant veins - in this manner both the venous flux and reflux are eliminated and the varicose veins are taken out of the circuit (they become just empty collapsed non-functional tubes) -a non-compressive bandage is applied.
3. The patient is immediately mobilized and leaves the clinic after 30 minutes.
4. Postoperative check-ups (after 24 hours, 7 days, 2 months and every 6 months).
Results: The closing-up of the varices takes place immediately in 100% of the cases. 5-year follow-up: recurrence after VANST occurs in 4.3% of the cases. VANST can be applied in a great variety of cases: troncular insufficiency of the GSV and of the SSV including the giant varicose veins, varicose veins complicated with lipodermatosclerosis or leg ulcer,

varicose veins thrombophlebittis, recurrent varicose veins and varicose veins of non-saphenous origins.
Conclusions: VANST is both a radical method which permanently takes the varicose veins out of the circuit and at the same time a conservative one which preserves the patient's normal venous capital.VANST can be an excellent treatment choice in difficult cases (giant varicose veins, varicose thrombophlebittis, tortuous non-saphenous varicose veins).

A comparison of adjunctive tributary laser ablation and foam sclerotherapy in patients undergoing truncal endovenous laser ablation for lower limb varicose veins

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Background: NICE guidelines recommended simultaneous treatment of varicose tributaries for patients undergoing truncal treatment, whilst lack of evidences should be recognized. This study compares outcomes of patients receiving simultaneous tributaries' endovenous laser ablation (EVLA) or foam sclerotherapy (FS) with EVLA of great saphenous vein (GSV) trunk.
Methods: 418 patients (542 legs) with diagnosed varicose veins were recruited. Patients in EVLA/FS group (255 patients, 327 legs) received concomitant FS for the tributaries in the context of truncal lasering. For EVLA alone group (163 patients, 215 legs), tributaries (8W) were ablated with EVLA in addition to GSV trunk (14W). Complications, Aberdeen varicose vein questionnaire (AVVQ), EuroQol 5-dimension (EQ-5D), numerical rating scale (NRS) and condition of residual varicosities were assessed at 3 days, 4 weeks and 6 months after procedure. All residual varicosities were identified and eliminated with a staged FS at 6 months.
Results: Except for ecchymosis, incidence of other complications was not significantly different between both groups at 6 months. Pain numerical rating score (NRS) of EVLA/FS group was remarkably elevated at 4 weeks, and then declined to a level comparable to EVLA alone group at 6 months. EVLA/FS group exhibited more significant improvement in both AVVQ and EQ-5D scales than EVLA group at 6 months, while having poor improvement at 4 weeks. EVLA/FS group had a significantly lower rate of residual varicosities than EVLA group, thus reducing the need for the staged FS.
Conclusions: These results confirm the feasibility and safety of simultaneous tributaries' EVLA and FS, and indicate better early QoL improvement and a reduced reoperation rate of simultaneously combined truncal EVLA and tributaries' FS.

SCLEROTHERAPY

Biomatrix sclerofoam: a coming option for leg vein treatment

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Background: Common sclerofoams (Cabrera type, including VariThena/BTG) are inferior to thermo-occlusion regarding primary and long-term results. A novel viscous microfoam using a biomatrix based on denatured autologous blood proteins now was evaluated in various targets.
Methods: In a prospective study, 85 patients (56 f, 29 m, 31 – 78 J.) were selected in bail-out situations to receive biomatrix sclerofoam (BSF) instead of standards. Targets (N.=230) were: 1. GSV including SFJ, 6 – 14 mm Ø, mean: 8.7 mm, N.=65; 2. SSV including SPJ, 6 – 11 mm Ø, mean: 7.2, N.=20; 3. Perforators, 4 – 11 mm Ø, mean: 6.9 mm, N.=43), 4. tributaries, 5 – 13 mm Ø, N.=64; 5. Recurrent varicosities 5 – 15 mm Ø, N.=38. The foam, prepared from 40% Aethoxysklerol 2%, 20% biomatrix and 40% gas, was deployed via catheter (PhleboCath, 2.0 – 2.3 mm Ø, or Microcath 1.6 mm Ø). Follow-up including ultrasound was performed after 2 weeks, 2 months and one year.
Results: Primary total occlusion of all segments intended to treat was obtained in 213/220 cases (96.9%). 7 targets (3.2%) required a second foam application (GSV: N.=1, tributaries: N.=2, perforantors N.=2, recurrencies N.=2). There were no complications, in particular no DVT. After one year, partial reperfusion was observed: SFJ 3/65 cases (4.3%), GSV: 4/65 (6.2%), SSV: 1/20 (5.0%), tributaries: 6/64 (9.4%), perforantors: 4/43 (9.3%), in recurrent varicosities: 4/38 (10.5%).
Conclusions: The novel foam is safe and effective for all major leg vein targets to occlude. Direct comparison to endovenous standards will follow.

Are all foams the same?

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Background: A review/overview of what parameters affect the quality of sclerosant foam in terms reproducibility, stability and bubble size and the clinical implications.
Methods: Foam was made using 3% and 1% sodium teradecyl sulphate and air using the Tessari method. An air to liquid ratio of 4 or 3 parts air and 1 part liquid were used.
The time for a given volume of liquid to settle out of the foam was measured. Six non experts made seven replicates for each strength/liquid:air combination.
Bubble size change over time was also measured for each combination.
Results: Bubble size increases with time but the brand of syringe can have a dramatic effect on bubble quality.
Air to liquid ratio has a large effect on stability with 4+1 being more stable than 3+1 liquid:air.
The reproducibility is very good with little difference between replicates.
Conclusions: Physician made foam can be of excellent quality and is very reproducible. Syringes and or connectors can alter the foam properties significantly and a brand that makes foam that is stable for at least 60 seconds should be chosen.

Factors influencing recurrence after ultrasound-guided foam sclerotherapy for superficial venous insufficiency

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Background: We investigated factors influencing recanalization using near-infrared spectroscopy before and after ultrasound-guided foam sclerotherapy (UGFS).
Methods: Fourty-eight limbs in 46 patients with great saphenous vein (GSV) reflux received foam sclerotherapy using 3% polidocanol-foam. Near-infrared spectroscopy (NIRS) was used to measure calf muscle oxygenated (O_2Hb) and deoxygenated hemoglobin (HHb) levels before and 3 months after foam sclerotherapy. On standing, increases in O_2Hb and HHb were calculated by subtracting the baseline value from the maximum value (ΔO_2Hbst and ΔHHbst). The time elapsed until the maximum increases in O2Hb and HHb concentrations (TO_2Hbst, and THHbst) were also measured. During 10 tiptoe movements, the relative change in O_2Hb was calculated by subtracting the value measured at the end of exercise from the value measured at the beginning of exercise (ΔO2Hbex). On the other hand, 10 tiptoe movements produced venous expulsion (ΔHHbEex) and a subsequent retention (ΔHHbRex). The oxygenation index (HbD; HbD=O_2Hb-HHb) was also calculated at the end of standing and 10 tiptoe movements (ΔHbDst and ΔHbDex).
Results: Of 48 limbs evaluated, 12 patients developed recurrent varicose veins with a mean period of 10 months. There were no significant differences in the NIRS-derived parameters between patients with and without recurrence before UGFS. However, TO_2Hbst was significantly reduced in patients who developed recurrent varicose veins compared to those who did not (67.8±33.9, 126.9±53.9 sec, P=0.0004). After calculating suitable cutoff point using receiver operating characteristic curves analysis, TO_2Hbst <75 sec was found to be a predictor of recurrence (area under the ROC curve 0.78, 95% CI 0.64-0.89, P=0.0001). There were no significant differences in other parameter sat 3-month.
Conclusions: These findings suggest that TO_2Hbst <75 sec measured by NIRS at 3-month predict recurrent varicose veins after UGFS. Measurement of these parameters by NIRS is simple and non-invasive, and was able to indicate functional improvement after UGFS in patients with superficial venous insufficiency.

Skin necrosis – an unpleasant reality of sclerotherapy (Czech Sodium Tetradecyl Sulfate – STS-study)

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Background: Skin necrosis can occur as a side effect of sclerotherapy after using practically any sclerosing agent (liquid of foam), on any vein diameter or localization and using whichever technique. In majority, the cause of its origin remains unknown. Several mechanisms are assumed.
Methods: 10.057 sclerotherapy treatments performed in CDA in Prague between November 2015 and June 2016 we performed and evaluated by our team of 4 experienced phlebologists with sclerotherapy practice of more than 15 years.
The study has an Ethic Approval from local Czech authorities
Results: In comparison to Australian Polidocanol Clinical Trial (skin necrosis in 0.34%), we found 0,21% when using STS. A detailed analysis of locations and concentrations of STS are presented.

Conclusions: Skin necrosis after sclerotherapy appears in a comparable rate in both most frequently used sclerotherapy agents (POL and STS). Informed consent of the patient regarding possible complications and adverse sequelae of sclerotherapy should be a standard as much as correct and immediate treatment.

Off-leg sclerotherapy

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Background: Patients infrequently request vein treatment on non-lower limb sites such as chest, dorsal hands and peri-orbital areas. Sclerotherapy remains a useful and safe non-surgical treatment method. This paper reviews non-surgical treatment options (sclerotherapy, lasers, adjunctive fillers) for non-lower limb veins.
Methods: (1) Pubmed literature search for "hand vein sclerotherapy", "chest vein sclerotherapy" and "periorbital vein sclerotherapy".
(2) Clinical audit for non-lower limb veins treated with sclerotherapy and/or lasers for patients attending the author's private practice over the period 2018 – 2017.
Results: Pubmed search uncovered 55, 28 and 7 citations for "hand vein sclerotherapy", "chest vein sclerotherapy" and "periorbital vein sclerotherapy" respectively. Reports were typically of evidence level 4 (case series, case control studies) and level 5 (expert opinion).
Liquid and foam sclerotherapy have been commonly advocated for all 3 sites.
The clinical audit revealed dorsal hand veins (53 patients), periorbital veins (12 patients) and chest veins (6) as the most common non-lower limb sites for sclerotherapy. Despite concerns about potential sclerotherapy-related complications in relation to proximity to vital organs, procedural outcome is very favourable with minimal adverse effects.
Conclusions: Non-lower limb veins can be effectively treated with sclerotherapy, often in combination with adjunctive modalities such as lasers (periorbital veins) and fillers (dorsal hand veins).

Unwanted veins of the forearm and the hand: treatment options

Alexander Flor

Since 2006 we are treating unwanted veins of the forearm and the back of the hands. With age skin becomes thinner, age spots appear, and subcutaneous tissue becomes thinner, so that veins of the back of the hand become more prominent.
Another group of patients are sporty young people esp. woman, running, exercising, gym. We have a defensive approach and always ask our patients if and why they do not like their veins.
Foto documentation is made. Malignancy or lack of veins in the cubita would be an exclusion criteria.
Three techniques will be presented:
In most of the cases, esp. in thin dilated veins and tortuous veins of the back of the hand FOAM sclerotherapy is the technique of choice. Concentration is 2- 2,5% Polidocanol, a SYRIS V900 Cross Polarisation is used for augmented reality. Treatment time about 5 minutes for both hands, repeated after one week and three weeks. Induration might occur. Severe side effects like thrombosis never occurred.
Thick walled veins of the hand are treated by miniphlebectomy. Even when done in Tumescent anesthesia it might be a bloody procedure.Skin Nerves might be damaged.
Endolaser Treatment is our third treatment option, preferably for long, stretched, thick walled veins of the forearm. The procedure is very effective, yet time consuming.A short Video will be presented.
Treatment of the veins of the hand and the forearm is part of ästhetic phlebology. Therefore every Phlebologist should know the basic treatment options.

Compression film bandage after leg vein sclerotherapy: two weeks *versus* four weeks wearing

Johann Chris Ragg

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Background: Compression stockings or bandages are not suitable for continuous wearing. In spite of these media, results of sclerotherapy are often unsatisfactory, due to inflammations, residuals and stainings. A novel compression film bandage (CFB) now underwent evaluation of two weeks *versus* four weeks of wearing.
Methods: In this prospective and randomized study, 450 eligible legs with superficial varicosities, 5 - 16 mm Ø, mean 7.9 mm Ø (354 patients, 23 – 74 yr/o) were included in the study. CFB (prototype 3M/Venartis Inc.) was applied immediately after foam sclerotherapy and worn continuously. Randomization: 6 groups with equal diameter distribution (+/- 0.3 mm): CFB for 14 or 28 days with a renewal after 14 d, CFB plus compression stocking German class 2 for 14 or 28 days day over, and compression stocking alone day over for 14 or 28 days. Follow-up examinations including ultrasound and photography were performed after 2, 4 and 8 weeks.
Results: During follow-up, symptomatic inflammations, residuals/induration or stainings were observed in the compression stocking group in 62.5% (14 d) *versus* 51.3% (28 d). When using CFB combined with compression stockings, symptoms were reduced to 9.3% (14 d) *versus* 4.7% (28 d), and 12.3% (14 d) *versus* 6.8% (28 d) for CFB alone. More than 80% of the cases contributing to the differences were larger than 10 mm in diameter.
Conclusions: Four weeks of CFB wearing are more effective in achieving symptom-free vein regression than two weeks. The benefit was in particular relevant for target vein diameters above 10 mm.

DEEP VENOUS OBSTRUCTION AND RECONSTRUCTION

Endovascular treatment of May-Thurner syndrome

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Background: May-Thurner syndrome represents compression of the left iliac vein from the right iliac artery causing disturbed venous drainage leading to chronic venous insufficiency (CVI)- edema, varicose veins and discomfort in lower limbs. It is a high risk factor for deep vein thrombosis (DVT). Timely exact diagnosis and endovascular treatment can prevent DVT and relieve the symptoms of CVI.
Methods: To evaluate vascular and clinical results of exact diagnosis and endovascular treatment of patients with May-Thurner syndrome.
Material and methods: in the period 2012-2017 29 patients (25 females) were diagnosed with May-Thurner syndrome including 9 /31%/ with CVI and 20 /69%/ with posthrombotic syndrome; Venous stenosis were established using EchoDoppler, CT phlebography and conventional phlebography. In all patients endovascular therapy was performed including balloon angioplasty or stenting
Results: The diagnosis of a May-Thurner syndrome was confirmed with conventional angiography and phlebography. In all of the patients stenting of the left iliac vein was performed. Due to bilateral compression in 3 patients we implanted stents on the right iliac vein, as well (kissing stents). No significant complications were registered. The patients received continuous antiplatelet and anticoagulant therapy. We established 100% success rate in early and late results on 6th and 12 th month respectively regarding stent patency and clinical improvements.
Conclusions: May-Thurner syndrome may be successfully diagnosed by color Echo Doppler, CT and conventioanl phlebograpy in patients symptomatic for venous compression syndrome. Implanting of a venous stent in the iliac vein is remarkable with high success rate, removes the compression, improves the venous insufficiency and prevents the development of DVT.

Intraoperative evaluation of Iliac Vein Compression syndrome (IVCS) by IVUS and comparison with venogram

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Background: To investigate the sensitivity of IVUS in evaluation of IVCS before and after treatment and compare it with venogram.
Methods: This was a prospective single-center study with ethical approval from institutional authorities. From 2016.6-2017.6, all patients presenting C4-C6 symptoms and diagnosed IVCS were enrolled. A venogram was performed in three projection angles and calculated the diameter stenosis. Then IVUS was perfromed with the measurement of the area and diameter stenosis. Post predilation, the luminal area of the lesion was re-measured with IVUS. After the implantation of stents, venogram and IVUS were both performed to confirm the patency of the lesion and measure the stented lumen. During follow-up, CTV was performed to observe the patency of bilateral iliac vein. The comparison of luminal area and diameter of IVCS before and after treatment was made between venogram and IVUS with statistical analysis.
Results: 40 IVCS patients were enrolled with 44 iliac veins evaluated by venogram and IVUS. The average diameter and area stenosis of IVCS measured by IVUS were both significantly higher than that calculated by venogram: 64.80%+13.38 *vs.* 46.32%+12.64 and 56.63%+31.75 *vs.* 45.53%+24.50, respectively. Post predilation, IVUS indicated no evident increase of the lesion. After stenting of IVCS, IVUS showed the lesion underwent significant increase from 3.55+1.50 mm to 9.93+2.09 mm and no negative effect on the contralateral iliac vein. During follow-up, CTV demonstrated 100% patency of bilateral iliac veins.
Conclusions: IVUS has provided reliable intraoperative evaluation of IVCS and more accurate measurement than venogram.

Comparison of the surgical and conservative treatment of the popliteal vein entrapment (compression) syndrome

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Background: The treatment of popliteal vein entrapment syndrome (PVES) is still controversial with several choices for treatment. The surgical method and the conservative method were compared.
Methods: Between 2007 and 2017, 8 patients (all female, mean age 41), 12 limbs have been observed and treated conservatively for PVES. Diagnostic criteria included calf ache, swelling and tenderness of the popliteal fossa and a positive result on a passive dorsiflexion test, showing compression of the popliteal vein on venography or echography, and a hypertrophied, aberrant, or laterally-shifted medial head of the gastrocnemius muscle on MRI. Four limbs showed popliteal or soleus muscle vein thrombosis. Conservative treatment included reduction of body weight, decreasing the standing work time, walking pigeon-toed, using high-heeled shoes, and trigger point block with xylocaine. Anticoagulant therapy was added for the thrombosed cases.
Results: During years 1-8 of follow-up, 8 limbs, 67%, were improved and 33% were unchanged when the patients returned to their former lives. Four vein thrombosis became localized and fibrous. A comparison made with the former surgical cases (11 patients, 14 limbs) appeared in Phlebology 2002*, which showed 57% of limbs were symptom- free, 21% were improved and 21% were unchanged.
*Hirokawa M, Iwai T *et al.* Surgical treatment of popliteal vein entrapment causing symptoms. Phlebology (2002)17:103-107
Conclusions: Surgical treatment is highly beneficial in severe symptomatic cases. Others are treated conservatively first, at least for several months. The development of popliteal vein thrombosis will be carefully followed.

Risk factors for and causes of thrombosis complicated by stent implantation for iliac vein compression: a retrospective analysis of a large cohort

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Background: To explore the risk factors for and causes of thrombosis after stent implantation for iliac vein compression (IVCS).
Methods: A retrospective analysis of 1031 patients with IVCS was performed to identify risk factors for thrombosis in stent or contralateral deep vein. The images of the recurrent patients during follow-up dura-

tion and interventional surgery were also reviewed to find the possible reasons of thrombosis. The odds of symptomatic thromboiss *versus* stent implantation for IVCS were assessed using logistic regression models. The association between thrombophilic risk factors, stenosis degree, primary deep vein thrombosis (DVT) before stent implantation, the length of stent embedded into inferior vena cava, stent misalignment, was assessed.
Results: Among the 1031 patients, 72 IVCS patients who underwent stenting experienced thrombosis. Multivariate analysis high fibrinogen concentration and D-dimer and primary deep vein thrombosis (DVT) before stent implantation, were associated with the complicated thrombosis. The length of stent embedded into inferior vena cava, stent misalignment were the main causes of the complicated thrombosis.
Conclusions: High fibrinogen concentration and D-dimer and primary deep vein thrombosis (DVT) before stent implantation, are the main risk factors for thrombosis, which may be caused by stent misalignment and stent embedded in IVC.

Transabdominal ultrasound can be a reliable screening tool for May-Thurner syndrome and other iliac vein lesions using a dedicated criteria

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Background: May-Thurner syndrome and other iliac vein lesions are increasingly recognized as important contributors in the development of Chronic Venous Insufficiency, Deep Venous Thrombosis and Pelvic Congestion syndrome. It is widely believed that ultrasound has significant limitations when visualising abnormalities in the iliac veins due to their deep location in the abdomen. We postulated that, in the hands of experienced operators and using the comprehensive criterion described in this paper, transabdominal duplex ultrasound can and should be used as a reliable and cost effective first-line imaging study when screening for May-Thurner syndrome and other Iliac Vein Lesions. In this study we focused on assessing the accuracy of the described transabdominal ultrasound criterion by validating the results using 3-D multi-planar venography.
Methods: We prospectively designed a comprehensive criterion for identifying Iliac Vein Lesions on transabdominal ultrasound by focusing on vein diameters. We applied the diagnostic criteria to 433 patients between April 2016 and April 2017. A subgroup of severely symptomatic patients, referred to a vascular specialist, were then offered 3-D multiplanar diagnostic venography and the results between the two methods were compared. Selected cases also had pressure measurements and intravascular ultrasound imaging.
Results: During the 12 month period 194 of the 433 patients screened were found to have iliac vein obstructive lesions (44.8%). Seventy five patients then underwent 3-D multi-planar diagnostic venography. Agreement between transabdominal ultrasound and venography was found to be 97.1% when the described criterion was used.
Conclusions: Transabdominal ultrasound using a dedicated criterion with reduced vessel diameter as the main indicator of pathology can be a reliable, non-invasive, highly accessible screening tool for Iliac Vein Lesions or May–Thurner syndrome and should be included as part of a complete assessment for patients presenting with venous insufficiency or pelvic congestion symptoms.

Whole progress management of acute iliofemoral venous thrombotic disease treated by AngioJet® combined with Wallstent®

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Background: The purpose of this study was to objectively assess the treatment effect and safety of AngioJet® combined with Wallstent® in acute iliofemoral vein thrombosis treatment under the protection of inferior vena cava (IVC) filter.
Methods: 45 patients with acute iliofemoral vein thrombosis combined with iliac vein compression syndrome (IVCS) during January 2015 and June 2016 were enrolled. Clinical records of all patients were evaluated. Stent patency was assessed using duplex ultrasound. Clinical outcomes were evaluated using a clinical symptom score (Villalta) and the revised venous clinical severity score (rVCSS) at 3, 6, 12 and 24 months in follow-up.
Results: Primary treatment success was achieved in all patients. Mean follow-up was 20±5 months. Primary patency estimates by Kaplan-Meier analysis were 97% at 6 months, 91% at 12 months, and 82% at 24 months. Seven symptomatic patients underwent reintervention for early and late stent thromboses or in-stent restenosis. At the latest follow-up, 71% reported complete resolution of symptoms. The Villalta score decreased by 5±4 points (P=0.04) and the rVCSS score by 3±2 points (P=0.05).
Conclusions: In patients with acute iliofemoral vein thrombosis and IVCS, stent implantation to solve the residual obstruction after Angiojet might play an important role in preventing PTS.

Intravenous leiomyomatosis of the inferior vena cava revisited: an experience of 8 cases

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Background: To summarize the experience on the diagnosis and therapy of IVL of the inferior vena cava.
Methods: Clinical data were retrospectively analysed with eight IVL of the inferior vena cava patients in our hospital from 2009 to 2017.
Results: The patients were ranged from 35 to 56 yr (mean: 45.9 yr). Six cases were hospitalized due to lesions in the inferior vena cava examined by ultrasound or CT, the other were found when the right atrial space occupying lesions were being treated. three cases invaded to the right atrium, four to the posterior hepatic vein, one to the renal vein level. All patients underwent surgical treatment, two cases of right atrium invaded were treated with staged operation, bilateral ovarian and accessories resection was performed in five patients, unilateral resection in two and bilateral ovaries were reserved in one; the tumor was resected with the help of transesophageal echocardiography in two cases. One case developed deep vein thrombosis and was cured after anticoagulation therapy, no serious complications occur in others. Intravenous leiomyoma was suggested in pathology. One case suffered recurrence after 1year, the remaining cases without recurrence.
Conclusions: Bilateral ovarian and accessories should be resected for reducing the estrogen level and further avoiding the recurrence. Staged surgery is more safety when the lesion involves right atrium, the resection of the tumor can be safer and more accurate under the transesophageal echocardiography. Total surgical extirpation of the tumor is the only effective treatment for this diease and have good prognosis.

Deep venous valve reconstruction: femoral transposition and neovalve

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Background: Because of the complexity of the procedures, deep venous surgery is challenging, performed in only a small number of centers, and the outcomes remain controversial. The purpose of this paper was to report our first case series and the outcomes of the deep venous surgery in the patients with deep venous insufficiency (DVI).
Methods: The indications for the deep venous surgery were the patients who had DVI and persistent active ulcers even after the compression treatment, the suppression of superficial reflux and perforator insufficiency, and endovascular iliac vein stenting. From July 2013 to April 2017, the deep venous surgery was performed on 14 patients (5 femoral transposition and 10 neovalve). We performed the femoral vein transposition if the ipsilateral great saphenous vein has a proximal competent valve and adequate caliber. The neovalve procedure was carried out if the superficial reflux and perforator insufficiency had been suppressed previously.
Results: Ulcer healing was observed in all 15 limbs within 2 and 12 weeks after the surgery (median, 6.6 weeks) with one recurrent symptom with a mean follow-up of 25 months (range, 5-46 month). Postoperative evaluations (descending venography and duplex scanning) were performed, and showed that 1/15 had occluded at 1 month after the neovalve operation, and the remaining 14 were still patent at the last follow-up.
Conclusions: Although the numbers were too small to analyze the outcomes, our experience demonstrates both the feasibility and effectiveness of the reconstructive deep venous surgery for the recalcitrant venous ulcers.

Iliac vein compression syndrome in an asymptomatic patient population and follow with visit in 3 years. A prospective study

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Background: The purpose of this prospective study was to determine the incidence of IVCS in an asymptomatic patient population and to evaluate for risk factors in patients with and without IVCS.
Methods: From October 2011 to November 2012, a total of 500 patients with no vascular related symptoms were enrolled in this study. We compared the stenosis rate of the common iliac vein in women and men according to age and followed-up patients to evaluate outcomes.
Results: The mean compression degree of the left common iliac vein (LCIV) was 16% (4%, 36%); 37.8% of patients had a compression degree ≥25% and 9.8% had a compression degree ≥50%. There was a significant difference between men and women in the LCIV compression degree (9% [3%, 30%] *vs.* 24% [8%, 42%]; U=4.66, P<0.01). In addition, the LCIV compression degree among younger women was significantly different compared with that in middle aged women (42% [31%, 50%] *vs.* 19% [5%, 39%]; U=5.14, P<0.001). Follow-up was completed in 367 patients with a mean follow-up of 39.5 months (range, 6–56 months).Multivariable Cox regression analysis showed that the stenosis rate was an independent risk factor of IVCS.
Conclusions: The incidence of IVCS was low and correlated with the stenosis rate of iliac vein. Preventative therapy may be warranted for common iliac vein compression in patients at an increased risk of venous thromboembolism, especially patients with a higher iliac vein compression degree.

Intravascular ultrasound (IVUS) guided stenting of the common iliac vein

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Background: Common iliac vein stenosis are complex, long and diffuse. The fibrotic sleeve that envelops long segments of the iliac vein produces stenosis and occlusion. Intravascular ultrasound (IVUS) provides a convenient way to identify and to treat this lesion with IVUS-guided stent placement.
Methods: The analyses are derived from medical records and cases of 15 iliac vein stent procedures performed from 2015 to 2017. We performed a detailed intravascular ultrasound planimetry and description.
Results: Patients with highly symptomatic chronic venous disease resistant to conservative therapy were treated with IVUS-guided stent placement. The incidence of long and complex lesions was 86%, only 14% had focal lesions. After POBA, stenotic area increased from a median of 58 mm2 to 64 mm2. Lumen area increased to 160 mm2 after stent placement.
Conclusions: The lesion extension is easily missed with conventional diagnostic techniques and may not be recognizable even with venography, unless intravascular ultrasound is used. POBA as a primary treatment invariably fails to correct focal or diffuse iliac vein stenosis, and stenting is always required. The degree of stenosis (percentage stenosis) was based on area measurements, not diameter. The IVUS guided stenting permits the proper measure and deplyment of the stent in the common iliac vein.

Endovenous ablation of leg veins: should we be more or less radical

Alexander Flor

In phlebology we will alway discuss if we should use a technique more radical or less radical.
We were educated that every patient's Vena Saphena Magna (Parva) needs to be stripped over the whole length with access through big incisions in the groin or in the poplitea. Then came miniphlebectomy in the seventies, scientifically described nowadays in the ASVAL technique, no Crossectomy,no stripping anymore.
Using Endolaser in our clinic since 2001 we realized that one big advantage of the Endolaser is that due to the possibility of multiple punctures someone could treat just insufficient vein segments, and spare healthy vein segments.
For example: treating less truncal veins in the lower leg, because they are of normal size, no reflux.
Or not treating the greater saphenous vein distal of the distal point of insufficiency in Hach 2-3 varicosity, when the insufficient vessel is a vein parallel to the greater saphenous vein yet direct below the skin.
Yet we have to realize that in some patients or in some anatomic situations this concept might end up in a higher rate of recurrency.
In the presentation some situations are presented in which a more radical, even prophylactic use of the Endolaser might be advisable.

ClosureFast Endovenous Radiofrequency Ablation (ERFA) for GSV-SSV incompetence. Efficacy and failure patterns. A 3 years follow-up – the Australian experience

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Background: Recurrence and its patterns after open surgery and stripping are well documented; however, not much is reported on long-term results after endovenous radiofrequency ablation (ERFA). Thus this study was designed to address those questions after a 3 years follow-up.
Methods: 200 patients who were close to complete or had completed 3 years post treatment for venous incompetence were invited to return for assessment as part of an ongoing observational study. 106 patients responded and returned for review.
Results: A total of 68 females and 38 males with a mean age of 49.4±11.5 years presented for follow-up review. The number of limbs was 180 including 208 incompetent venous trunks (GSV-170/SSV-37/AAV-1). Patients underwent clinical assessment and comprehensive duplex venous incompetence study. Mean follow-up time was 42.1±20.1 months. Visible disease progression at time of review was apparent in 31 patients (29.2%). Recanalization/Recurrence/Failure within the duration was apparent in 16 limbs (8.9%) (F=10/M=6). 27 patients (25%) presented some form of neo-incompetence in 31 trunks. Patients with truncal recanalization had BMI>30Kg/m2.
Conclusions: The group who underwent follow-up is heterogeneous and possibly motivated, therefore impacted by "self-selection" bias. The rate of recanalization after the 3 year period is higher than reported in the existing literature. Increased BMI was found to be a constant and appears to be a contributing factor to truncal recanalization. Further investigation is required. It might be necessary to have a specialized minimally invasive treatment protocol for patients with high BMI undergoing ERFA.

The Swiss registry of Thermic Endovenous Catheter Therapy (Swiss TECT Registry) in varicose veins. A multicenter case study

Christina Jeanneret-Gris

Background: The aim of the study was, to assess the efficacy and safety of thermic endovenous catheter therapy (TECT) in patients with varicose veins.
Methods: All physicians of the Swiss Society of Phlebology, performing TECT (such as Lasertherapy or Radiofrequency ablation) were asked to participate in a central register. 13 of 22 initiated centers are active since. 2 centers never included patients for unknown reason and 7 centers withdraw their participation agreement because of workload. On the basis of a „Case Report Form" (CRF) the interventions and 3-4 follow-up examinations (1 week, 1 month, 1 and new since 2016 also 5 years) had to be documented by the treating physician. Baseline data (age, BMI) and parameters of the intervention modalities (catheter diameter, wave length, laser energy applied) as well as the diameter of the treated vein were assessed. The length of the insufficient vein segment according to Hach were described. The duration and type of compression therapy and thromboprophylaxis had to be assessed. At the follow-up examinations at 1 week and 1 month (visit 2 and 3) clinical assessment concerning thrombosis in the deep veins of the leg and complete duplex sonographic investigation of the proximal deep veins of the treated leg was done. At the follow-up examination at 1 and 5 years (visit 4 and 5) duplex sonography of the treated segment was done to asses occlusion status. Partial occlusion was defined as detectable flow in <50% occluded veins.
Results: 3,992 vein segments in 2,308 female and in 768 male patients (3,076 all patients) (75% female=2,308) were included up to 31st of October 2017. In 2,148 vein segments (54%) visit 4 was completed and in 272 cases visit 5 was done. Mean (±SD) body mass index (BMI) amounted to 25 (±6.3) kg/m2 and mean age to 53.9 (±14.4) years. 2'577 cases were done in an outpatient clinic (64%). In 81% tumescence aesthesia was used. The number of insufficient vein-segments described according to Hach stages were the following: Great saphenous vein Hach II: 482 (13.4%), Hach III: 1'916 (53.4%), Hach IV: 516 (14.4%), for the small saphenous vein Hach II: 299 (8.3%), Hach III: 330 (9.2%). Deep venous insufficiency was described in 265 cases (6.7%). Mean (±SD) vein diameter before treatment at the sapheno - femoral junction amounted to 0.76±0.34 cm, and at thigh level 0.65±0.30 cm, respectively. Wave length of 940 nm was mostly used and total fluence used in 99% of the cases had a range of 3600 7200 J. In 93.6% of all cases thrombosis prophylaxis was applied. At one week 33 cases with venous thromboembolism occurred in 3'806 treated legs (0.86%), 11 venous thrombosis were found in the distal veins. The non-occlusion rates at one week and one year were 3.3% (110/3806) and 3.6% (78/ 2'136 vein segments), respectively. The 5 year Follow-up was performed in 268 vein-segments, only 3 vein segments were not completely occluded.
Conclusions: This registry shows a low complications rate with 0.86% venous thromboembolism, however one central pulmonary embolism occurred. The occlusion rate of 96.7% after one year is comparable with those published in the literature. Recurrence rate over the years has to be assessed in the future.

Venous distension in patients with aneurysmatic arterial disease compared to the venous distension in patients with arterial occlusive disease and to healthy controls

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Background: The aim of the study was to assess venous distensiibility in patients with aneurysmatic arterial disease (AAD) compared to venous distensibility in patients with peripheral arterial occlusive disease (PAOD) and in healthy subjects (HS).
Methods: Measurements were carried out in 150 legs of 79 patients (27 AAD, 26 PAOD, 26 HS). The aortic diameter in Patient with AAD had to be ≥3 cm, for the popliteal artery aneurysm a diameter of ≥1.5 cm was mandatory. Patients with arterial occlusive disease (PAOD) were include if their ankle brachial index (ABI) was <0.9. Venous diameter at baseline and during a standardized Valsalva Manoeuvre was assessed. The common femoral vein (CVF), the femoral vein (FV) and the great saphenous vein (GSV) were investigated in a longitudinal view in M-mode. The absolute and relative venous diameter differences (VD diff and VD diff %) were measured. Relative venous diameter difference in % was the quotient of venous diameter difference and maximal venous diameter.
Results: Relative venous diameter (VD) differences were significantly larger in the CFV, the GSV and the FV in the AAD-goup compared to the PAOD-group and compared to HS. The relative median (IQR) venous diameters (%) measured in the right CFV of the patients in the AAD-, PAOD- and HC group amounted to 30.5 (16.5), 19.2 (13.4) and 19.8 (10.0), respectively (P AAD *vs.* HC=0.0001, P AAD *vs.* PAOD=<0.0001, P PAOD *vs.* HC=0.69). For the FV, median (IQR) VD in % for the AAD-, PAOD- and HC group were: 27.5 (9.6), 13.8 (11.1) and 12.3 (11.9), respectively (P AAD *vs.* HC=<0.0001, P AAD *vs.* PAOD=<0.0001, P PAOD *vs.* HC=0.51). The relative median (IQR) VD

in % in the right GSV in the AAD-, PAOD- and HC-group were: 22.3 (11.7), 11.6 (7.6) and 12.5 (10.9), respectively (P AAD *vs.* HC=<0.0001, P AAD *vs.* PAOD=<0.0001, P PAOD *vs.* HC=0.66).
Conclusions: Venous distensibility measured with a standardized Valsalva manouevre is significantly larger in patients with AAD compared to patients with PAOD and compared to HC. The venous distensibility does not differ between HC and patients with PAOD. We assume a vessel - wall weakness in patients with AAD affecting not only the arterial but also the venous system.

Is it necessary to treat tributaries after truncal ablation?

Majid Moini, Marjan Ladan

Background: To obtain optimal clinical improvements Concomitant phlebectomy is advised by some authors; Although some prefer to give time to the residual varicosities to shrink after GSV ablation. This study is aimed at looking ways to decrease sequential reinterventions and increase patient's early cosmetic satisfaction after GSV ablation.
Methods: We studied on 107 patients with primary varicose veins between 2014-2016. All had SFJ and GSV incompetency plus visible tributaries. Two groups identified: Group A, who had undergone RF ablation plus staged phlebectomy or sclerotherapy. Group B, who had undergone one step RF ablation plus phlebectomy. Patient's early cosmetic satisfaction and number of procedures needed to treat residual tributaries recorded in a 6 month period.
Results: Group A: 42%(24 in 57) of legs in RF-only group needed additional treatment on residual tributaries, in 6mo follow-up. In group B: 7.5%(4 in 55) of legs in RF-phlebectomy group needed further therapy,in 6mo follow-up.Complications were minimal and comparable in both groups. Cosmetic results were more satisfying in group B.
Conclusions: Concomitant GSV ablation and phlebectomy is an acceptable procedure with minimal complications. Advantages are early patient satisfaction and reduced number of subsequent interventions.

The novel minimally invasive mechano-chemical method of the saphenous vein ablation. One center experience - results of 12 months follow-up

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Background: Over the years chronic venous insufficiency (CVI) and its aftermath are still considered as a serious medical problem, being significant financial burden for the patients as well as for the entire society. *Objective* - The aim of the study was evaluation of the clinical efficacy novel method mechano-chemical ablation of the saphenous vein with usage Flebogrif™ catheter. The re-canalization rate, total volume obliteration agent usage, possible complications, cosmetic results, method effectivnes in case of veins above 8mm in diameter.
Methods: 200 patients were treated (Great Saphenous Vein, Small Saphenous Vein) with the use of Flebogrif™. CEAP and VCSS (Venous Clinical Severity Score) scales were used to assess CVI symptoms in different time frames. Follow-up visits were set as follows: 1, 3, 6, and 12 month post-op.
Results: After 12-month-period, statistical analysis was performed with the use Wilcokson and Friedman's tests. Statistically significant decrease in the clinical symptoms in the measured time points were noted (0-4; 4-6; 6-12 months). The efficacy of Flebogrif™ was assessed to 92%. Ten patients with full, and five with partial recanalization was found.
Conclusions: High rate of success (92%), low number of complication, very good cosmetics effect. For fully evaluation Flebogrif catheter longer time of follow-up is required

Comparison between foam sclerosis, radiofrequency and laser in the treatment of large varicose veins in Mexico

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Background: The most frequent problem associated is saphenophemoral reflux. Surgery continues to be the gold standard for the treatment. In the last 15 years various minimally invasive procedures have been introduces to treatt saphenofemoral reflux. The most frequent in our country are endovenous laser ablation (EVLA), radiofrequency ablation (RFA), and ultrasound guided foam sclerosis (USGFS).
Methods: We made a comparison between these three modalities of treatment in our country. We reviewed three different non-randomized groups of patients. All of the patients needed tratment for saphenofemoral reflux. We followed the patients for 18 months post procedure. CEAP classification was made for each and everyone of the patients.The patients were evaluated for total closure of the SFJ, changes in the QOL scale, postoperative pain score at postop day three, associated morbidities, and cost of the procedures.
Results: We performed the study between january 2010 and march 2017. EVLA group comprised 129 patients, RFA group comprised 117 patients, USGFS comprised 152 patients. Of the 398 total of patients,(223) were female and (175) were male,average age 57 years. All patients were examined with duplex scan before the pocedure and at 15 days postop, 30 days postop, 6 months and 12 months. CEAP average in the EVLA group was 4.7, in the RFA group was 3.7, and in the USGFS was 4.2 Total closure at 15 days postop was as follows for each group; EVLA 92.5% of patients, RFA 91.8%, and USGFS 84.25%. At 30 days postop the total closure rate for all three groups was EVLA 84.25%, RFA 90.81%, and USGFS 81.88%. At 12 months total closure rate was EVLA 83.3%, RFA 87.7%, and USGFS 77.16% We measured QOL by CIVIQ 20 questionaire preop and at 6 weeks after surgery. CIVIQ QOL questionaire average for the 3 groups were as follows; EVLA 67, RFA 63, USGFS 74, at 6 weeks postop results were EVLA 79, RFA 81, USGFS 82.Postoperative pain measured by visual analogue scale at three postop day was EVLA 6, RFA 5, USGFS 3.
Conclusions: New minimally invasive procedures are an excellent option in our country to treat patients with SFJ reflux with less morbidity and atleast the same rates of closure as the gold standard procedure.

Current status and progress in primary lower extremity varicose veins care

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Background: To generally analyse the current situations and advances in the primary lower extremity varicose vein care.
Methods: Electronic databases including Medline, PubMed, Cochrane Library and three Chinese databases were searched with key words of "varicose veins", "lower limb" and "care". We considered studies about Primary lower extremity varicose veins care, randomized controlled tri-

als, prospective or retrospective cohort studies that compared the outcomes of Primary lower extremity varicose veins patients managed with different care methods.
Results: 30 studies were included, from these articles, we found Primary lower extremity varicose veins care mainly includes rationing patients for varicose vein surgery, primary care referrals, exercise training program in post-surgery patients, the standard of compression therapy following varicose vein surgery, and the therapeutic effectiveness evalution. Through the review of related researches at home and abroad, and combining the domestic clinical practice, the nursing staff should pay attention to the patients' physiological, psychological and social situation assessment and intervention, promoting patient led preoperative self assessment and screening, ensuring the rehabilitation intervention measures are evidence-based.
Conclusions: Improving the professional quality of nursing, ensuring the rehabilitation intervention measures are evidence-based, and innovating the nursing service for lower extremity primary varicose veins are the necessary driving forces to promote the rehabilitation of patients.

Long-term results from medial re-do groin surgery

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Background: How to deal with varicose vein recurrence especially regarding groin recurrence has hardly been studied scientifically. This audit was performed to assess, long term, a new medial open surgical approach to deal with groin recurrence in the form of remnant incompetent saphenous stumps.
Methods: In an audit regarding varicose vein interventions at our institution, Sept. 2009 - Aug. 2010, 33/ 252 inverventions were groin recurrence operated by a medial approach by several surgerons. The operating time was 69 minutes in median (35-120). Follow-up with colour duplex was performed after 4-6 weeks, 1 year and after more then 5 years. Quality of life was assessed by the Aberdeen Varicose Vein Questionaire (AVVQ) answered by the patients before and 1 and 5 years following the surgery. Varicose Vein Severity Score (VCSS) was also assessed before surgery and afte by independent obsrvers. The patients views on the result were also registered.
Results: The total follow-up for 22/33 patients (67%) was 69 months (39-75). 30/33 (91%) were followed for at least one year. No serious complications were registered. The AVVQ scores were reduced from 26 down to 12 and 17 respectively (P<.0001). The VCSS was similarily reduced from 7 to 3 at both follow-ups (P<.0001). A majority of patients was satisfied with the overall long term result (66%). After one year 80% were free from duplex detected groin recurrence and the figure after 69 months was 59%. The 41% with incompetence was mostly caaused by neovascularization although three also had returning stumps.
Conclusions: This audit shows that medial open surgical treatment of remianing saphenous stumps seems to be a valid treatment option that previously has been considered difficult to perform. In a time when more and more stump recurrences are reported after endovenous treatments this technique can become a valuable tool to deal with these recurrences.

Humanitarian varicose vein treatments in Central and South America: a personal journey

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Untreated sequelae of chronic venous insufficiency leads to impairment on quality of life and ability to work. Central and South America have decreased access for their patients to obtain any treatment for their chronic venous disease.
Over the past two years we have been part of a Humanitarian Mission in Matapalga, Nicaragua lead by Dr Nick Morrison as the Amigos de Salud (friends of health). Here a group of doctors from the USA, Canada, UK, Italy, Argentina and Australia work conjointly with vascular sonographers, nurses and any extra hands that will volunteer their time to assess, treat and manage patient's in the region. We treat patient's with compression garments, lymphatic drainage, endovenous laser ablation, radiofrequency ablation, Venaseal and Ultrasound Guided Sclerotherapy to improve the health of their lower limbs.
This year Dr Huaman, myself and two doctors from Australia will be working as the Austral Humanitarian Mission in Tucuman, Argentina to assess and treat patient's venous insufficiency via compression stockings, endovenous laser ablation, radiofrequency ablation, Venablock, Veinoff and ultrasound guided sclerotherapy.
Giving up one's time to give back to humanity is priceless. A big thank you to trade for donating Venosan stockings, laser fibers, radiofrequency devices, sclerosants and cyanoacrylate to make this possible.

BASIC SCIENCE

Metabolic phenotyping of chronic venous disease

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Background: Chronic venous disease (CVD) is a common condition with an important clinical and socio-economic burden. Much is unknown about the biological pathways involved in disease development and progression. The aim of this was to characterize the metabolic phenotype of CVD patients compared to healthy volunteers and explore the correlation across CEAP class.
Methods: Participants were recruited from a single center (October 2014-June 2016). Ethical approval was obtained for recruitment of both patients and controls (REC reference 13/EM/0011). Individuals with clinical symptoms of CVD scheduled for intervention and symptomatic individuals were invited to participate. Serum and urine samples were collected and subjected to nuclear magnetic resonance spectroscopy experiments. Multi- and univariate statistical techniques were employed in data analysis.
Results: 517 individuals with CVD and 105 healthy volunteers were recruited. Age and CEAP classification were the most statistically significant models on multivariate analysis; a regression analysis was performed for the most significant metabolites across the CEAP spectrum. Serum metabolites positively correlating with CEAP included: 1-methylhistidine, phenylalanine, tyrosine, glycerol, lysine and succinate.
There was a negative correlation between urinary metabolites and increasing CEAP class. Statistically significant trends were identified for formate, creatinine, glycine, citrate, succinate, pyruvate and α-hydroxyisobutyrate.
Conclusions: Identified metabolites are relevant to the tricarboxylic acid cycle for energy metabolism, hypoxia inducible factor pathway and the one-carbon metabolism. This suggests increased energy metabolism in higher CEAP classes (C4-6), which may be due to increased CVD severity, although the possibility that this is due to cutaneous effects of CVD cannot be ruled out. This work has important translational potential with respect to diagnostic, prognostic and therapeutic applications in CVD.

Detergent sclerosants induce cellular apoptosis

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Background: To investigate the effects of detergent sclerosants sodium tetradecyl sulphate (STS) and polidocanol (POL) on human leukocytes and endothelial cells at sub-lytic concentrations.
Methods: Human Umbilical Vein Endothelial Cells and human leukocytes were labelled with antibodies to assess for apoptosis and oncosis by fluorescence microscopy and flow cytometry. Cell viability and membrane integrity were assessed using trypan blue, fluo-3 and propidium iodide (PI) staining. Phosphatidylserine (PS) exposure (apoptosis) was identified by flow cytometry using lactadherin. Caspase 8 expression was used as a marker of the extrinsic pathway of apoptosis and Bax for the intrinsic pathway. Porimin expression was used to assess oncosis.
Results: Up to 40% of leukocytes and endothelial cells maintained membrane integrity at sub-lytic concentrations (≤0.15%) of sclerosants. The remaining 60% did not maintain membrane integrity but were not completely lysed. PS exposure was increased with both STS and POL exhibiting a dose- and time-dependent trend. Expression of both Caspase 8 and Bax was increased in both leukocytes and endothelial cells treated with STS while those exposed to POL expressed increased Bax only. Both agents increased the leukocyte expression of porimin at 0.075%. On fluorescence microscopy, stains for Caspase 8 and Bax were slightly increased for STS and only Bax was increased for POL. Porimin stain was markedly positive for both STS and POL.
Conclusions: Both sclerosants induced leukocyte and endothelial cell apoptosis and oncosis at sub-lytic concentrations. STS activated both extrinsic and intrinsic pathways of apoptosis while POL stimulated the intrinsic pathway of apoptosis only. Both agents stimulated the porimin pathway of oncosis.

Persistent aggregates at the valve sinus are different from sludge or thrombus. A pilot study on description and potential reversibility

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Background: Background: Using novel high resolution ultrasound systems (HRU), valvular structures and low-flow microaggregates may be depicted today in a more detailed way. This study examines the appearance of temporary and permanent blood particle aggregations.
Methods: 60 patients (41 f, 19 m; 32-58 yr/o.) were included, representing 3 groups of professions with >6 hours of daily sitting (N.=20), >6 hours of daily standing (N.=20) and cases with less than 2 h of sitting or standing during work. All underwent HRU (8-16 MHz, peak up to 40 MHz, Vevo MD). A total of 120 well depictable GSV vein valves, all without reflux, were selected for this study. Persistent microaggregates (PMA), defined as blood particle aggregates not dissolving during any movements, were registered. Two subgroups were examined for changes of PMA during 3 months of newly started wearing of compression stockings, or flavonoid medication (Daflon 500).
Results: Persistent microaggregates were found in 47/120 "healthy" vein valves (39.1%). They were much more frequent in valves of subjects with sitting or standing professions (73/80; 91.3%, *versus* 10/20, 50.0%). In a subgroup receiving compression stockings, 21/26 of examined valves showed reduction of PMA (80.8%), in the second subgroup receiving flavonoid medication reduction of PMA was seen in 9/13 valves (69.2%).
Conclusions: Persistent blood cell aggregates at the valve sinus seem to be associated with lifestyles including long periods of decreased or stagnant flow. The criterion of PMA may potentially be used in future for the evaluation of benefits of compression device, physical activity or medication. The study will be continued, adding histology and cytology.

Microscopic examination of sclerocoagulum: what is trapped blood?

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Background: The aim of this study was to determine the microscopic characteristics and structural composition of *ex-vivo* coagulum/trapped blood post-sclerotherapy.
Methods: Coagulum/trapped blood was identified and extracted with a 20mL syringe Samples were stained for fibrinogen and analysed with

fluorescence microscopy or dehydrated and coated in gold palladium and analysed by scanning electron microscopy.
Results: On fluorescence microscopy fibrin strands in trapped blood appeared to be thinner than the strands found in spontaneous thrombus samples. Trapped blood displayed a disorganized mesh-like pattern. On scanning electron microscopy, a disorganized pattern was evident. There was a small number of clusters of platelets and multiple polyhedrocytes generated during the platelet contraction stage of the clot. There were also multiple debris and structures resembling casts of cells.
Conclusions: In conclusion, coagulum/trapped blood seen after sclerotherapy shares similarities with spontaneous thrombus formed in superficial veins. Trapped blood contains a vast number of polyhedrocytes confined into the fibrin strands. They also present a reduced number of clusters of platelets. However, the distribution of the fibrin strands is different showing a disorganized, mesh-like pattern and the strands seem to be thinner. There were also an increased number of cast structures that have not been described previously.

Potential driving role of the component of the extracellular matrix, MFAP5, in the pathogenesis of varicose veins

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Background: Despite the high prevalence of varicose veins, our knowledge of the molecular mechanisms underlying their pathogenesis is extremely scarce. There may be mechanical factors triggering a complex cascade of cellular reactions that may subsequently be amplified by genetic factors. Previously we have shown that extracellular matrix component – microfibril-associated protein MFAP5 (known to play an important role in maintaining the vascular integrity) acts as a potential key regulator of vein wall remodeling. So we aimed to investigate the effect (in terms of *MFAP5* expression) of mechanical factors on the endothelial cells analogous to those that constitute the inner layer of the vein wall.
Methods: Determination of mRNA expression was performed by reverse transcription followed by real-time qPCR. Statistical analysis was performed using the qBase+ software.
Results: The functionality of the model used was verified by the effectiveness of the influence of laminar shear stress on the expression of key transcription factors (KLF2, ET-1, etc.). We observed the increase of the *MFAP5* expression in endothelial cells upon exposure to laminar shear stress, which is consistent with our previous transcriptome analysis and is an additional confirmation of the potential driving role of this component of the extracellular matrix in the pathogenesis of varicose veins.
Conclusions: We conclude that the *MFAP5* gene may contribute to the very initiation of the disease. Nevertheless, the further investigations are required.
Experiments were supported by the Russian Science Foundation (Project 17-75-20223 "Investigation of the mechanisms of vein wall remodeling in varicose veins").

Microbiological study in primary varicose veins

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Background: Multiple etiologies of the varicose veins are postulated. Most accepted one is the incompetence of valve leading to dilatation of non-truncal as well as truncal veins, but the cause of incompetence of valve is still unknown. In the recent years bacterial etiology is being blamed for varicose veins. Aim of this study was to see association of bacteria with varicose veins.
Methods: A prospective study was conducted in Department of General Surgery, Institute of Medical Sciences, BHU, Varanasi, India. OneHundred patients of varicose vein were enrolled in the study.The patients of DVT and localized lower limb infection/Ulcerationor systemic infection were excluded.Thepatients underwent radiofrequency ablation of great saphenous vein with multiple miniphlebectomy. Sample of miniphlebectomy and truncal veins was collected under aseptic condition, and sample was immediately sent to microbiology laboratory for bacterial culture and for 16s-rRNAPCR analysis. Ten specimens of normal veins were taken for study.
Results: 42 trunkal veins were cultured and bacteria grown were *Micrococcus (17), Pseudomonas (6), Staphylococcus (2), Klebsiella (4), Proteus(2), Citrobacter(1) and spore forming bacteria (1).* Ten specimens were sterile. 113 non trunkal veins were cultured and showed *Micrococcus (31), Pseudomonas (14), Staphylococcus (12), Klebsiella (6), Proteus (2), Citrobacter (2), Diptheroids (2), Acenatobacter (1) and spore forming bacteria (12).* 31 specimens were sterile. On PCR study, in 42 trunkal veins results were, *Pseudomonas (10), Staphylococcus (6), Klebsiella (5), Proteus (2), Citrobacter (1)*, 11 could not be identified and 7 were sterile. On PCR study in 113 non trunkal veins were *Pseudomonas (25), Staphylococcus (19), Klebsiella (7), Proteus(2), Citrobacter(1*). 39 could not be identified and 20 were sterile. In normal veins, out of 10 cases, one showed growth of micrococci.
Conclusions: In considerations of the findings, bacterial etiology for varicose veins may be considered.

Functional polymorphisms in the *NFKB1* gene and the risk of primary varicose veins in ethnic russians

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Background: Primary varicose veins (PVVs) are common venous pathology of lower limbs. The etiology of this condition was postulated to be multifactorial, although current knowledge of genetic factors underlying PVVs development is still very far from being complete. The present study was aimed to investigate the influence of two functional polymorphisms rs28362491 and rs4648068 in the *NFKB1* gene on the risk of PVVs in the sample of ethnic Russian individuals. This gene encodes a subunit of a pleiotropic transcription factor which controls the expression of multiple genes involved in cell proliferation, differentiation, adhesion, apoptosis as well as angiogenesis and inflammatory response.
Methods: Genotyping was carried out by real-time PCR allelic discrimination with TaqMan probes. 695 patients with PVVs and 269 control

individuals were tested. Statistical analysis was performed using the GenABEL statistical package.
Results: We revealed the association of rs28362491 -94 ATTG deletion variant with the decreased risk of PVVs in patients having C3 CEAP class (OR=0.73, C.I.=0.57-0.94, P=0.01). This allele variant lowers *NFKB1* promoter activity and has previously been shown to reduce the level of its downstream target gene product MCP-1. Our result is consistent with our previous observation that a low-producing *MCP1* rs1024611 A allele is associated with reduced PVVs risk.
Conclusions: Our results provide evidence that *NFKB1* gene polymorphism could play a role in genetic susceptibility to PVVs.
Experiments were supported by the Russian Science Foundation (Project 17-75-20223 "Investigation of the mechanisms of vein wall remodeling in varicose veins").

Biomarkers of inflammation in chronic venous disease of the lower limbs

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Background: to analyze serum biomarkers of chronic venous disease (cvd) in selected patients with primary reflux of great saphenous vein of the lower limbs.
Methods: seventy-six patients affected by uncomplicated varicose veins were enrolled in the study. A unilateral primary axial reflux in grats saphenous veins was detected in 51 patients (U-CVD) and a bilateral one in 25 patients (B-CVD). Sixty-five age and sex-matched subjects without venous reflux were enrolled as controls. Mean venous pressure of both lower limbs at the distal great saphenous vein and venous reflux were measured by continuous-wave Doppler ultrasound and echoduplex scanning respectively. Reactive Oxygen Species (ROS), tissue Plasminogen Activator (t-PA) and its Inhibitor 1 (PAI-1) activities, Hematocrit (HTC), White Blood Cells (WBC), Platelets (PLT), Fibrinogen ann Blood Viscosity were assessed in blood samples drawn from the antecubital vein.
Results: B-CVD group showed higher fibrinogen values (P<0.005) and higher mean venous pressure (P<0.0001) in comparison to controls, while U-cvd did not. No difference was found between both groups and controls for all the other parameters.
Conclusions: Incresased fibrinogen levels in patients with bilateral varicose veins may represent an early warning signal, as il could be associated to the long-tem progression of chronic venous disease.

Histological changes following closure FAST treatment

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Background: In Germany, the crossectomy following the BABCOCK procedure and stripping of the great saphenous vein were considered as the… "gold standard" in varicose treatment since 1907. Only in the late nineties of the last century was a new and less invasive treatment of varicose vein developed: the endovenous obliteration. It was our intention to make a contribution towards objectivizing the result after the Closure FAST therapy.
Methods: In our tests we made a mini-incision to remove a part of the great saphenous vein after radiofrequency treatment with the Closure FAST catheter for histological examinations.
Results: In all our patients we found the same alterations: A complete destruction of the intima layer, a denaturation of the collagen and a subintimal edema. After 4month we saw a complete obliteration of the vein and a thrombus in organization with an immigration of granulocytes in the tissue.
Conclusions: After the Closure FAST treatment of varicose veins in 102 patients we have the histological proof for the destruction of the intima and the collagen with necrosis and destruction of the vessel wall. The result is the complete obliteration which was confirmed by Duplexscan and MRT after 1 year. The detailed statistical analysis follows.

A novel view to varicose veins pathogenesis

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Background: The advent of proteomics techniques allows large-scale studies of gene expression at protein level. Although morphological and anatomical studies indicate that venous wall weakening and subendothelial fibrosis characterize varicose veins, the pathogenesis of varicose veins remains poorly understood. The aim this study is to obtain protein expression profiles in patients with varicose veins. Finally, the identification of possible biomarkers may open possibilities for pharmacological inhibition of disease progression.
Methods: Varicose saphenous veins removed during phlebectomy and normal saphenous veins obtained during vascular surgery were collected for proteomics analysis. The same layers of venous wall from varicose and non-varicose veins were incubated, and the proteins released were analyzed by ion mobility spectrometry (IMS-MS) with Synapt G2.
Results: Proteomic analysis of the human vein revealed totally 1387 proteins. 200 proteins demonstrated significant differences in their quantity (more than 1.5 fold) between the two types of venous tissue (P<0.05). Among the most differentially expressed proteins 10 were found significantly decreased in the varicose vein tissue, and only two-increased. CXXC-type zinc finger protein was more permanent (38- fold down regulated). The downregulation of CXXC-type zinc finger was confirmed by Western blotting. This protein is known as receptor for vascular endothelial growth factor. All differentially expressed proteins and their pathways, coexpression and physical interactions were analyzed in GeneMANIA and AmiGO databases.
Conclusions: This study provides novel insights into the biochemical mechanisms of this disease and a basis for further studies. Our proteomics discovery approach suggests that extracellular matrix degradation play a pivotal role in the pathogenesis of venous varicose. The identified proteins suggest that the varicose venous wall responds to a stressful condition and that proteolytic degradation of the cytoskeleton, inflammation and apoptosis of smooth muscle cells may be part of the response. Larger studies are required to confirm the potential and clinical role of the identified proteins.

COMPRESSION

Tissue texture affects overall interface pressure measurement

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Background: Interface pressure, the sine qua non for compression therapy, is defined as the pressure that occurs at the interface between the body and the support surface. Significant challenges remain in the understanding of interface pressure especially related to tissue texture and how it affects the measurement of interface pressure. We hypothesize tissue texture variation affects overall interface pressure measurement.
Methods: BISCO® (Rogers Co, Rogers, CT) MF-35 and HT800 silicone foams replicating fatty and bony tissue, respectively, were placed on a cylinder cuff model for the experiment. Picopress® was used for interface pressure measurement. External pressure was applied using an automated pressure cuff pump from 20mmHg to 80mmHg at 10 mmHg increments. 3 sample measurements were taken per pressure value. Interface pressure recordings were compared between the MF-35 and HT800 foams at different pressure increments using linear fixed effect model (SAS software, version 9.4, SAS Institute, Cary NC).
Results: Interface pressure measurement using Picopress® on 2 different foam surfaces showed statistical significant variation from 30mmHg to 80mmHg. At 20mmHg, interface pressure measurement was not statistically different between the MF35 and HT800 foams. Interface pressure measurement tended to measure higher value on softer surface, MF35 than harder surface, HT800 (Table 1).
Table 1:
Pressure /MF35(mmHg) /HT800(mmHg) /Difference /P-Value
20mmHg /21.9 /21.9 /0 />0.999
30mmHg /32.3 /31 /1.3 /<0.001
40mmHg /42.7 /40 /2.7 /<0.001
50mmHg /53.1 /49 /4.1 /<0.001
60mmHg /63.6 /58.1 /5.5 /<0.001
70mmHg /74 /67.1 /6.9 /<0.001
80mmHg /84.4 /76.2 /8.2 /<0.001
Conclusions: Tissue texture variation may affect overall interface pressure measurement using Picopress®. Harder surface tended to register lower interface pressure measurement than softer surface.

Development and validation of the psychometric properties of a self-reported questionnaire assessing adherence to the wearing of elastic compression stockings

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Background: To identify the discriminant questions of a short self-questionnaire measuring patients' adherence to the wearing of elastic compression stockings and to validate its acceptability, test-retest reliability, internal consistency and external validity.
Methods: The gold standard for the development of an evaluation questionnaire involves the use of varimed rotation to reduce the number of its item and then to evaluate its internal consistency using Cronbach's alpha test. Its external validity was evaluated by comparison to the electronic record of the wearing of the elastic compression using electronic thermic captors. Then the study defines the adherence threshold using ROC analysis to determine its sensitivity and specificity.
Results: The study included 79 patients. The mathematical methods obtained a reduction of the number of questions of the initial questionnaire from 22 to 5 rated from 0 to 4. The internal consistency of this 5 item self-questionnaire is good with a Cronbach Alpha coefficient of 0.7. Its external validity is satisfactory with a correlation of -0.4 (P: 0.0003) with the compliance index. The analysis of the ROC curve shows that values of the score ≤3 corresponds to a good compliance to the elastic compression while values >3 correspond to poor compliance with a sensitivity of 88.1% and a specificity of 63.1%.
Conclusions: The adherence score is valid for the detection of patients poorly compliant to the wearing of elastic compression. Its small number of questions makes it a suitable tool for this screening of poor compression compliance in everyday practice.

Misfitting measures? Contrast between anthropometric leg parameters and commercially available compression stockings

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Background: Compression Therapy is the most traditional treatment for varicose veins, venous edema, ulcerations, etc and elastic stockings (ES) have been used worldwide. The pressure delivered by the ES is proportional to stockings fabric strain. There is no open source data about anthropometry studies that supports ES modeling and its interaction with lower limbs.
Our objective is to trace a lower limbs anthropometric profile and cross it with ES label measures.
Methods: A Cross-sectional analysis was performed analyzing 1075 medical records. 1650 legs avatars from eletronic measured were collected. Label measures from ES commercial available in Brazil were sort to compare with the data.
Results: Huge amount of descriptive data have been produced. Highlights include: each ES sample has only 71% off coverage on average and 1,5% of all legs don't have any match with the available ES. Considering only measures from this complete Misfit group, all calf's circumference are proportionally bigger in relation to ankle. A calf – ankle ratio bigger than 1,77 implies 12,5% odds of complete Misfit and only 42% chance to fit into a non-specific ES.
Conclusions: ES are an important tool to manage venous disease. Their prescription demands knowledge about patient leg's measures and its proportion. Limbs with higher calf – ankle ratio (1,77 or higher) have an increased Misfit risk.

Compression therapy in everyday life: let the patients have the floor

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Background: Compliance to the compression therapy is the main key for its efficacy, and there is a universal agreement that progresses are needed in this field. The aim of this survey was to evaluate the feeling of the patients about their own compression treatment.

Methods: An auto-questionnaire consisting of six open questions was proposed to patients wearing long term compression stockings for a chronic venous disorder. The questions related to the way they felt about their treatment, their three main motivations and three main difficulties, and how they had felt about their treatment when it was prescribed for the first time.
Results: The survey was carried out in august 2015 and may 2016. 283 subjects were enrolled in 15 centers. 59% of the patients felt positive about their treatment when 16% were negative. The main motivations were the improvement of symptoms (46%), the control of edema (24%). The main difficulties were related to the discomfort in warm environment (43%), the donning of the stockings (33%), and the esthetic consequences (23%); 18% reported a total absence of difficulties. Among the advice that patients received at the beginning of treatment, the most useful came from the vascular physician (28%). In many cases, the investigators were surprised about the answers of their patients.
Conclusions: This survey shows how important is the practical teaching of the patient by their prescribing physician, as well as the attention paid by the physician to their experience and feeling.

The effectiveness of graduated compression stockings for prevention of venous thromboembolism in surgical patients requiring extended pharmacological thromboprophylaxis

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Background: There is an increasing evidence base to support the use of extended pharmacological thromboprophylaxis in selected surgical patients to prevent venous thromboembolism (VTE). The benefit of graduated compression stockings (GCS) in addition to extended pharmacological thromboprophylaxis is unclear. The aim of this study is to systematically review the evidence relating to the effectiveness of using GCS in conjunction with extended pharmacological thromboprophylaxis to prevent VTE in surgical patients.
Methods: A literature search of MEDLINE, Embase, Cochrane library and clinicaltrials.gov databases was performed in accordance with PRISMA guidelines in April 2017. Randomized controlled trials (RCTs) were eligible for inclusion if one of the study arms included patients receiving extended pharmacological thromboprophylaxis alone or in conjunction with GCS. Data on VTE, pulmonary embolism (PE) and VTE-related death were compiled.
Results: The systematic search identified 1291 studies of which 19 studies were eligible for inclusion. No RCT directly compared extended pharmacological thromboprophylaxis alone with GCS plus extended pharmacological thromboprophylaxis. A total of 12,386 patients from 16 RCTs were treated with extended pharmacological thromboprophylaxis of whom 445 (3.8%) developed VTE and 29 (0.2%) had PE. Three trials included 337 patients who received extended pharmacological thromboprophylaxis in conjunction with GCS. There were 37 (11%) VTEs and no PEs in this group. Meta-analysis was not performed due to a high degree of heterogeneity amongst the studies.
Conclusions: The evidence regarding the addition benefits of GCS in individuals receiving extended pharmacological thromboprophylaxis for VTE prevention is not clear. A clinical trial directly investigating this important subject is needed.

Impact of class I compression stockings on cross-sectional area of calf deep veins and great saphenous vein in healthy subjects

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Background: Elastic compression improves venous pumping function of lower extremities. The mechanism of compression is considered as a venous narrowing. The exact impact of different compression garments on deep and superficial veins is still under investigation. The aim was to examine the impact of class I compression stockings on cross-sectional area of calf veins in healthy subjects.
Methods: The study has been conducted on a 25 healthy volunteers without any signs/symptoms of chronic venous disease. There were 12 women and 13 men aged from 20 to 48 years (mean 31). We performed duplex ultrasound on a one of the subjects' legs before and after applying compression stocking (Venotrain discretion®). The cross-sectional areas of one of the posterior tibial veins (PTV) and great saphenous vein (GSV) were measured (in cm^2) at the same level in a mid-calf in both standing and prone positions.
Results: Cross-sectional area of PTV in the standing position before and after compression was 0.19±0.11 and 0.17±0.11 with 11% reduction (P=0.044). In the prone position cross-sectional area of PTV reduced by 29% from 0.17±0.10 to 0.12±0.08 after applying compression (P=0.001). Cross-sectional area of GSV didn't changed significantly both in the standing position (before compression 0.11±0.07, after 0.10±0.04, P=0.897) and in the prone position (before 0.09±0.05, after 0.07±0.03, P=0.109).
Conclusions: Applying class I compression stockings results in a significant narrowing of the calf deep veins in healthy subjects in standing and prone positions. No significant impact of class I stockings on GSV was confirmed.

VENOUS THROMBOEMBOLISM

Reducing sludge in deep veins with neuromuscular stimulation

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Background: As blood flow slows or stops for an instant, echo-bright aggregates appear within the lumen of veins. This "erythrocyte sludge" can be quantified using a grey scale index (0-255) termed the venous sludge index (VSI). The aim was to investigate the effect of the common peroneal nerve stimulator (CPNS) on venous sludge formation.
Methods: The right popliteal vein of 25 healthy volunteers was insonated using B-mode ultrasound in longitudinal and transverse views, standing and lying. First with the CPNS off and then with the CPNS on. A single frame out of the possible 154 frames (7 seconds) was selected from the video recordings using a random number generator (Random.org). Image analysis (ImageJ®) was used to measure the VSI.
Results: The CPNS device significantly reduced the VSI irrespective of the subject's position or the view of the transducer (P<.0005, Wilcoxon). Expressed as median (inter-quartile range). In transverse view, CPNS reduced the VSI from 20.7 (13.6 - 32.2) to 1.1 (0.6 - 2.7) standing, and from 11.4 (6.3 - 15.9) to 0.8 (0.5 - 2.1) lying. In longitudinal view from 27.7 (18.8 - 41.4) to 2 (1.1 - 3.2) standing, and from 11.7 (5.5 - 17.5) to 1.5 (0.5 - 3.1) lying.
Conclusions: Venous sludge and stasis is significantly reduced using the CPNS device. Since stasis is a significant component of Virchow's triad, this may explain the principle mechanism of action of CPNS in reducing venous thromboembolism risk. However, the exact relationship between stasis, aggregation and thrombosis requires more research.

Registration study for real life evidence of anticoagulation treatment in Chinese venous thromboembolism (VTE) patients (REACH study)

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Background: Venous thromboembolism (VTE), which comprises deep vein thrombosis (DVT) and pulmonary embolism (PE), is a worldwide health problem with millions of events every year in China. However, there is a paucity of real-life data on the risk factors, clinical presentation, diagnosis, and therapy. The REACH (Registration study for real life Evidence of Anticoagulation treatment in Chinese Venous Thromboembolism patients) study in VTE registry is a prospective non-interventional study, which has been designed to address clinical characteristics and current management of VTE patients in China, aiming to understand health care resources for VTE and potential needs for improvement in the future.
Methods: The REACH in VTE registry was a prospective, non-interventional, observational, multicenter study conducted in at least 50 tier 3 hospitals in China. Eligible patients with age of over 18 years-old, clinically diagnosed as VTE were enrolled in the study and followed-up for at least 6 months. The characteristics as well as the therapy of the VTE patients, including surgical methods, anticoagulant treatment patterns, clinical outcomes, therapeutic safety and treatment satisfaction were documented. Follow-up data was collected through the visit in the out- patient department or telephone calls.
Results: From August 8th 2013 to August 31th 2017, 10520 patients in China were enrolled in the registry. The average age of VTE patients was 58.1±16.0, with a roughly equal proportion of men and women. Long-term bedridden was the major risk factor of VTE patients of whom 36.5% had history of operation, fraction or paralysis. Among the patients of DVT admitted to the hospital, 12.8% patients were diagnosed as DVT complicating PE. The majority of patients with DVT received non-operative therapy (64.3%) while the others undergone operation treatment (35.7%), including catheter-directed thrombolysis, placement of inferior vena caval filters and thrombectomy. The proportion of parenteral heparin in combination with VKA as initial treatment for DVT decreased from 57.6% before 2015 to 43.1% after 2015. By contrast, an increasing proportion of patients received the new oral anticoagulants as initial treatments in China (42.4% before 2015, 56.9% after 2015).
Conclusions: The REACH in VTE registry will provide valuable and real-life data of characteristics of patients with VTE and their management pattern, as well as the use of medical care resources in VTE across China in clinical practice.

Use of superior vena cava filter in the management of upper limb venous thrombosis

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Background: With the advent use of central lines and pacemakers upper limb DVT is increasing. Upper extremity DVT has 5-10% chace for developing PE. As anticoagulation is the first line of upper limb DVT tretmemt and when it is contra indicated filters become an option.
Objective: Evaluation of SAVC fiters safety and effectiveness in patients with upper limb DVT and contra indicated to full anticoagulation.
Methods: Forty nine patients with acute upper limb DVT were addmitted to Alexandria armed forces hospital from Jan. 1st 2015 to Dec. 31st 2016. Six patients were contra indicated to anticoagulation and SVC filter was then percutaneously inserted followed by chest x ray and pulmonary pressure measuring was done. Patients were clinically and radiological (CT angiogram) were followed-up fo PE or superior vena cava syndrome.
Results: No complications such as filter migration, fracture or dislogement was deetected. No patient developped PE or superior vena cava syndrome.
Conclusions: Percutaneous SVC filter placement is a safe and effective method for prevention of PE in upper extremity DVT patients with contraindication for full anticoagulation.

1H-Nmr spectroscopy metabolic profiling of serum in the inferior vena cava ligation murine model may discriminate deep vein thrombosis age

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Background: Deep vein thrombosis (DVT) is a prevalent condition responsible for significant morbidity and mortality, presenting a profound

economic burden on healthcare systems. 20-50% will develop post-thrombotic syndrome (PTS) despite adequate anticoagulation therapy. The use of thrombolysis during acute DVT may reduce the long-term complications of PTS. Thus, establishing thrombus age is critical. Current estimation of thrombus age is based on patient description of time of symptom onset. We aim to identify metabolic markers of thrombus age in mice.
Methods: The well-established inferior vena cava (IVC) ligation mouse model was used to generate DVT with comparison to sham laparotomy controls. Serum was obtained from DVT and control mice at days 2 (acute DVT), 6 and 14 (chronic DVT). ^{1}H-NMR spectroscopy untargeted metabolic profiling was performed. The data was subjected to multivariate and univariate statistical analysis.
Results: Twenty-four serum metabolites were identified. Lactate, choline, HDL and LDL-VLDL were present at significantly different levels in the serum of DVT mice compared to sham control animals at day 2. These differences were not statistically significant at days 6 and 14, suggesting that metabolic changes in thrombus formation and maturation occur early in the DVT process.
Conclusions: In the murine model, a metabolic disturbance is prominent in the early stages of DVT. This has important translational mechanistic and therapeutic applications in human DVT. Further work is required to examine the metabolic profile in the first 48 hours, exploring the underlying biological pathways.

Associations between inferior vena cava thrombosis and pulmonary embolism risk in symptomatic venous thromboembolism: a prospective and observational cohort study

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Background: Our prospective and observationalcohort study was performed to evaluate the prevalence and clinical significance and pulmonary embolism risk of IVCT in VTE patients.
Methods: A total of 846 patients hospitalized for symptomatic VTE in our center were evaluated by inferior vena cava (IVC) venography and pulmonary angiography. The clinical characteristics of the VTE patients complicated with IVCT were analysed,. The patients were followed-up for 30 days for short-term prognosis analysis.
Results: PE was more common in deep venous thrombosis (DVT) patients with IVCT than in those withou Multivariate logistic regression analysis showed that IVCT was an independent risk factor for PE. Trauma immunological diseases, and previously diagnosed VTE increased the risk for IVCT.No deaths occurred in patients with IVCT.
Conclusions: IVCT is widely observed in VTE patients and increases the risk for PE. Trauma, previously diagnosed VTE, and particular immunological diseases were shown to be independent risk factors for IVCT.

Crossover catheter-directed thrombolysis (C-CDT): a reasonable solution for acute DVT involving the whole leg

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Background: This study aimed to evaluate the efficacy and feasibility of Crossover catheter-directed thrombolysis in patients with Acute DVT involving the whole leg
Methods: Crossover catheter-directed thrombolysis was used in 232 patients with full-limb DVT, the onset time of 3 hours to 14 days. Puncture the contralateral common femoral vein, retrograde manipulation of the guide wire through the thrombosis of the iliac vein, femoral vein, popliteal vein to the calf vein, and then, after initial establishment of venous blood flow channel by ballooning the occluded veins, Catheter for direct contact thrombolysis. Postoperative observation parameters include: thigh and calf circumference, plasma D-dimer level, APTT time, fibrinogen levels, platelet count and venography.
Results: All 232 patients, in addition to two patients with Crossover difficulties, has to puncture ipsilateral femoral vein to use a catcher to assist the Crossover, the success rate of Crossover surgery technology reached 99.14%. Subsequent anticoagulation and thrombolytic therapy, 14 patients with varying degrees of bleeding complications. 92 patients with iliac vein compression, iliac vein stent implantation. Surgical treatment of the vein patency rate of 100%,. After discharge the patients are strictly regulate the use of anticoagulant drugs,followed-up for 6-30 months, 7 patients relapsed, the rest did not see significant recurrence and venous stenosis.
Conclusions: The crossover catheter-directed thrombolysis is a very effective and feasible method for completely and quickly dissolving the acute DVT with no obvious complication. It is a reasonable solution for acute DVT involving the whole leg.

Technical safety, feasibility and accuracy of ultrasound guided bedside placement of inferior vena cava (IVC) filters

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Background: To report technique feasibility and safety of inferior vena cava (IVC) filter placement under bedside ultrasound guidance.
Methods: Medical records of all 2856 patients who had IVC filters placed under ultrasound guidance between January 1, 2007 and December 31, 2016 were retrospectively reviewed for pertinent history, results, and complications. All filters were placed using a ultrasound guidance filter deployment technique. Venous access was via the right femoral, left femoral, or right internal jugular vein.
Results: Filters were successfully placed within the IVC in 99.7% of the patients without malpositioned filter. Complications included groin hematoma (0.07%), deep venous thrombosis at the site of vascular access (0.31%), and filter tilt >15° along the long axis of the IVC (0.03%).
Conclusions: The bedside ultrasound-guided IVC filter placement is technically feasible and safe with improved placement accuracy and cost effective, compared with the filter deployment under fluoroscopic venogram imaging.

Catheter directed thrombolysis in the treatment of acute DVT, A single center study

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Background: Venous thromboembolic disease (VTE) affects approximately 0.1% of the general population each year. Over 60% of cases are related to healthcare intervention, There is world's most population in China and also have the most DVT patient. The purpose of study was to evaluate the safe and effective of Catheter-directed thrombolysis at DVT.
Methods: From 2008, Jul 2015, Jun 129 Patients of DVT, accepted

Catheter-directed thrombolysis(CDT) in our department. Men 70-54.35%, female 59-45.65%, mean age of 53.85±14.54 years. All patents was daignosed to DVT by ultrasound before treatment. CDT Access was antegrade approach and that Inplanting catheter along the blood flow can reduce the damage to the valve. 750,000 U of urokinase per day was was infused into the position of thrombosis by Unifuse catheter for 2 d—5 d, Monitoring and end-point of CDT was to no significant changes in clinical symptoms or deterioration,Fib g/L <1, D-dimer μg/L was no change or decrease; patients with bleeding tendency etc.

Results: In all 129 Patients, Acute 107 cases 82.60%, subacute12 cases 8.70%, chronic 9 cases 6.52%,Left side 102 cases 78.26%, right side 17 cases 13.04%, bilateral 12 cases 8.70%. Central type 12 cases 8.70%, peripheral 5 cases 4.35%, hybrid 112 cases 86.96%. Urokinase dose 233.59±112.17 ×104 U and Course of treatment 3.49±1.59 d. Symptoms improved significantly at 126 cases 97.83%, No significant improvement in another 3 chronic cases 2.17%. No complication of needed to surgerical intervention during CDT.

Conclusions: Catheter-directed thrombolysis is safe and effective. it can be a therapeutic technique by selected for DVT, but the research being further still needs to be continued.

SCLEROTHERAPY

Instructions after chemical ablation of varicose veins – Patient's behavior after sclero-sessions

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Background: Instructions sclerotherapists give their patients after chemical ablation are various. All these recommendations rely on experience but it is not easy to find evidence for these advices.
The German sclerotherapy working group started a Survey in the German society of flebology in 2015 to have more information in the posttreatment care.
Methods: The doctors were asked to to communicate the recommendations they give their patients after a sclerosession concerning: motion after sclerotherapy session, which kind of sports are allowed, comedication, kind of thrombosis prophylaxis, recommendation for hot bath, shower, sunexposure, seasonal influence performing sclerotherapy, thrombectomy and compression therapy.
Results: We think that it is of practical importance for doctors to extend the survey on an international level to discuss and analyze the possible benefits of the posttreatment recommendations.
Conclusions: We suggest to send a questionary on the above mentioned individual behavior after sclerotherapy to the phlebological societies of the UIP. Furthermore we would like to present an online voting during the congress in order to collect further datas on this topic.

Perisclerotherapeutic management – Patient's behavior after sclero-sessions

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Background: The recommendations given by phlebologists to their patients after sclerotherapy treatment rely on much experience and very little evidence. Therefore the sclerotherapy working group started a survey in the German society of phlebology in 2015. The aim of this survey was to compile and summarize these individual recommendations after sclerotherapy procedures.
Methods: We sent a questionnaire with 25 questions regarding 7 different topics about individual behavior after sclerotherapy sessions to 1634 email addresses of doctors all over Germany. 91 of them filled in the questionnaire and sent it back (28 dermatologists, 19 surgeons, 16 vascular surgeons, 13 general practitioners, and 6 internal medicine specialists; 68 of them with an additional specialization in phlebology).
Results: We asked the doctors to communicate the recommendations they give their patients after a sclero-session concerning: motion after sclerotherapy, which kind of sports are allowed, co-medication, the preferred kind of thrombosis prophylaxis, recommendations for sun exposure or other sources of warmth, period of performing sclerotherapy: summer or winter, and compression.
Conclusions: We present these results.

Midterm results of an outpatient program with ultrasound-guided foam sclerotherapy for treating chronic venous disease in low-income population of Salvador, Brazil

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Background: Six million people need treatment for advanced Chronic Venous Disease (CVD) in Brazil. Most patients depend on the Government Health Care, which actually treat 70.000 patients/year. Recently UGFS was approved for CVD treatment by the Government.
To assess midterm results of an outpatient program with ultrasound-guided foam sclerotherapy (UGFS) for treating CVD in low-income population of Salvador (Brazil).
Methods: Single-public-center prospective-study; 4851 limbs of 2.894 outpatients (C2-C6) were treated with UGFS between 2013 and 2016. UGFS with Polidocanol (1%>3%) was performed, in association with compression therapy (stockings 20-35 mmHg, Unna's boot or Circaid) and specific dressings. Treatment efficacy was assessed by means of clinical examination, photography documentation and duplex-ultrasound at 1-2-3-4-12 weeks, 6 months, 1 year and yearly.
Results: patients (85%F and 15%M, mean age 59y) had the following CEAP-C distribution of their limbs: C2=917 (19%), C3=1.523 (32%), C4=942 (19%), C5=393 (8%) and C6=1076 (22%). Mean follow-up duration was 22,5-months; A mean of 2.2 sclerotherapy-sessions, 22,6 mL of foam-dose (C2_12.1 mL, $P<0.05$), and 6.8 outpatient weekly-visits(C6_17 visits, $P<0.05$) were performed to treat the patients. Immediate saphenous occlusion rate was 96% and ulcer-healing rate was 77%. At the latest follow-up saphenous vein recanalization rate was 15%. Main complications were: skin pigmentation (1.089, 22%), superficial thrombophlebitis (203, 4%) and deep vein thrombosis, mostly in calf veins(31, 0.7%).
Conclusions: This outpatient UGFS program in low-income population was effective and safe and it may represent an alternative to surgery to treat advanced CVD.

Evaluation and follow-up of pulmonary arterial pressure during echo-guided scleromousse of lower limbs' varicose veins

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Background: The echo-guided scleromousse is to be considered a procedure of election for the treatment of varicose veins and has largely contributed to improve living and health conditions in people suffering from varicose pathology of any age.The case studies follow-up has increased through a simultaneous echocardiography during the scleromousse treatment.
Methods: 50 peoples have been evaluates, 24 males and 26 females, with an average age of 57,5 years coming to Phlebology unit with a situation of vein failure Ceap 2; they have all accepted to undergo an echo-guided scleromousse treatment. People suffering from secondary and idiopathic pulmonar hypertension have been ruled out, as well as cardiopatic patients wit FE lower than 55% and/or VS and/or dilated VD, CRF, chronic respiratory failure and collagenopathies.All patients have sustained echocardiography in basal condition (T0) at the onset of "bub-

bles" in right ventricle (RV) (T1), after foam infusion after 5 minutes (T5) and after positioning of elastic antithrombotic sock 18 mmHg after 15 minutes (T15). During echo-cardiography, have been evaluated T0, T1, T5, T15, pulmonary arterial pressure (LAP), theldiastolic diameter and possible presence of interatrial shunt after Valsalva test.All patients have been measured arterial pressure at T0 and T15. All patients have been given a polydocanole dose in foam at the concentration of 1-2%.
Results: From the data analysis it results that in the population of patients suffering from serious vein failure Ceap 2, treated with echo-guided sclerosis with foam, a transitory increase in pulmonary pressure has been reported at T1, without overcoming the maximal values, with recover of basal values at the end of the treatment. No modifications of the theldiastolic diameters have been reported and in 4 cases the presence of an atrial shunt from right to left has been reported. The follow-up at 30 days highlighted modifications in basal values in comparison to the first treatment.
Conclusions: This study confirms that the treatment through sclero-mousse does not increase post-treatment pulmonary high pressure, right theldiastolic diameter, nor ventricular kinesis.

Sclerotherapy complications in the daily office practice: lesson learned

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Background: Sclerotherapy has been satisfactorily used for the treatment of patients with telangiectasias (C1) and varicose veins of the lower extremities (C2-C6). Although it seems to be safe, reports of side effects and complications have been published.
The aim was to describe and report incidence and frequency of side-effects and complications of liquid and foam sclerotherapy in patients with C1 to C6 in CEAP classification.
Methods: 4687 sessions of sclerotherapy (CEAP C1- 22,76%, C2- 52,36%, C3- 4,62%, C4- 14,76%, C5 1,4%, C6-4,1%) among 2493 patients of median age 53 (interquartile range IQR 16-92) were carried out between 2008 and 2017. Data on local and systemic complications immediately after the sclerotherapy session and after 1, 6, and 12 months were obtained and analyzed with reference to literature.
Results: Hyperpigmentation and matting were the most common local complications (16,96% and 9,44%, respectively), but usually transient (permanent 1,4% and 0,6%). Other local complications included also superficial thrombophlebitis (4,42%), pyodermia gangrenosum (0,62%) and cutaneous necrosis (0,68%). Systemic complications which included deep vein thrombosis (0,59%), neurological complications, such as seizure (0,0002%), visual disturbances (1,58%), migraine (0,7%), anaphylaxis (0,0002%) and cardiac toxicity (0%) were rarely observed.
Conclusions: Sclerotherapy is a safe and effective method of treatment of the patient with C1 to C6 but we should be aware of the possible local and systemic complications.

Sclerotherapy: a comparison between the Latin American and European Consensus with the Australasian Guidelines

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Background: The new techniques, imaging and blood tests had given a better understanding on both, the physiopathology of CVD and the effects of sclerosant agents in varicose veins. Therefore, it has become the most used treatment worldwide; however every physician has his own way to perform it, producing a variety of results. This is why experts on this field saw the necessity of reunite and create consensus about the important aspects of this treatment.
Background: To compare the 2nd European Consensus (2006, Tergenesse, Germany) and the 1st Latin American Consensus (2012, Buenos Aires, Argentina) with the Australasian College of Phlebology (ACP) guidelines.
Methods: A revision of the three papers.
Results: The three papers have many similarities, especially with the materials used, the caliber of the varicose vein to treat, sclerosant agent and foam technique. However the European consensus explains in a more detailed manner the safety aspects for the treatment of every type of varicose vein, the contraindications of the treatment and the information that should be given to the patient. And the ACP guidelines explain a step-by-step way to make the procedure.
Conclusions: Nowadays Sclerotherapy is worldwide the most spread technique for treating varicose veins.
Being operator dependent the results may vary around the world.
Consensuses are the guide physicians must use in order to consolidate the technique.
The ACP guideline for microsclerotherapy is a very specific document for every practitioner willing to use this technique.

Foam sclerotherapy for the treament of venous ulcer

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Background: Venous Ulcer (VU) is the major complication of Chronic Venous Insufficiency (CVI) having many negative consequences, including suffering for the patient and his family, high expenses and work impediment.
Many patients spend a long time searching for an effective treatment because physicians often spend too much time focusing on treating the wound and not the cause.
In our center we give priority to treatment of the venous hypertension, the cause of the VU in varicose patients. We only perform clinical evaluation of the patients, and our treatment consists on 4 pillars: Foam sclerotherapy, elastic compression, daily hygiene (at home) and physical rehabilitation (at home).
Background: To show that sclerotherapy for treatment of CVI is adequate and can gives great results in VUs.
Methods: Descriptive study. We studied 450 VU from 310 patients of the 2400 new patients that came to our center in 2016. We excluded incomplete clinical records, patients that abandoned the treatment prior healing, irregular treatment and less that 12 weeks of treatment. We got 180 patients with 250 VUs.
Results: Mean size of the ulcers was 15±45 cm2. 80% of the VUs healed. The mean time of healing was 10±10.04 weeks and for those that didn't heal, 55.06% reduce a 60% of its area.
Conclusions: We have found that every ulcer has an underlying venous reflux point. The use of Sclerotherapy gives great results, reducing size and time of evolution witch are the main factors for ulcer healing. Patient education is fundamental.

A modified foam treatment in chronic venous insufficiency: experience over 3000 patients

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Background: To compare the effectiveness of an alternative treatment (ligation plus foam sclerotherapy) with that of a classic stripping technique.

Methods: The study included 2577 and 3563 patients who had undergone classic stripping and foam sclerotherapy, respectively, within the previous 12 years. Preoperative and postoperative CEAP class, symptoms, recurrence, and Doppler findings of the two groups were compared.
Results: There were no differences between treatments in terms of postoperative symptoms, Doppler findings, or CEAP class. The predictors of postoperative CEAP class were bilateral limb disease and prior deep vein thrombosis (DVT), whereas the predictors of symptom recurrence were bilateral limb disease,preoperative CEAP class, occupation, and familial or genetic predisposition. The predictors of postoperative perforator incompetence (PI) were occupation, aged 60 and older, preoperative CEAP class,and preoperative PI, whereas the only predictor of postoperative deep vein incompetence (DVI) was preoperative DVI. Five-year symptom-free survival rates were 52±0.6% in the foam sclerotherapy group and 47±0.3% in the stripping group.
Conclusions: The safety and efficacy of ligation plus foam sclerotherapy as an alternative technique allowing for same-day surgery to treat varicose veins are the same as those of classic stripping. The predictors of postoperative outcome depend on individual patient characteristics.

The efficacy and safety of the endosclerosis treatment with foam of the hemorrhoids, ten years of follow-up

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Background: Aim of the study was to prospectively evaluate the efficacy and tolerability at 10 years of the endoscopic treatment of hemorroidal disease using sclerofoam with polidocanol.
Methods: All patients underwent a standard clinical work-up and only those fulfilling the inclusion criteria were recruited. Inclusion Criteria: symptomatic hemorroidal disease lasting more than 8 months of any grade, repeated bleeding at lest twice a week, constant pain during evacuations constant discomfort in daily activities. Exclusion criteria: severe rectal prolapse, allergy to sclerosing agents, preference for surgery. Among those recruited, 90 males and 60 females, aged between 18-75 years completed the 1 year follow-up. All patients were treated on two or three separate occasions: on day 1 and 30 and sometimes 60 day, and they received a 1% sclerofoam. All patients were scheduled for subsequent follow-up visits at 90, 180 and 360 days after completing the procedure and also a 2,3 and 10 year of follow-up. At each visit for each we collected data on number of bleeding episodes, hemorroid worsening, pain and discomfort by means of a quality of life questionnaire and a standardized pain scale.
Results: At 1 years 85.3% (CI 80.9-88.9) of treated patients had signifcantly less symptoms and discomfort and the time to reach the minimum averaged 62.5 days (CI 53.9-71.2). Minimum values of pain scale and bleeding episodes reached a minimum after 58.4 (CI 46.6-70.2) and 50.7 days (CI 38.3-63.1) respectively. Quality of life improved quickly and the time to reach the maximum value averaged 63.6 days (95% CI=54.1-73.1). According Goligher classification the percentage of hemorrhoids degree was: I degree: 9,9%; II degree: 66,3%; III degree 21,8%; IV degree 2%; At 10 years the results was 86% wellbeing but 13% repeated the procedure, 10% underwent to surgical treatment, and 4% drops out.
Conclusions: The study and the 10 years of follow-up suggests that the endosclerofoam of haemorroids is safe, well tolerated and effective in reducing symptoms and improving quality of life.

FEBRUARY 7, 2018
WEDNESDAY

DUPLEX ULTRASOUND

Investigation on trunk diameters of the great saphenous veins in daily practice of phlebology in France (diagraves study by the French Society of Phlebology)

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French Society of Phlebology (Société Française de Phlébologie), Paris, France

Background: Regarding the literature, failure of foam sclerotherapy seems to be more frequent if the diameter of the treated vein is >6 mm. The objective of this study was to evaluate the distribution of the GSVs diameters in daily practice of phlebology in France.
Methods: Thirty-five French phlebology centers were involved in this observational prospective study conducted by the French Society of Phlebology. The inclusion criteria were: C0s to C6 from CEAP clinical classfication in patients with venous symptoms and/or signs of chronic venous disorders and without any previous treatment of at least 1 of the GSVs. The patients completed a venous symptoms questionnaire. The GVS diameters were measured at mid-thigh level (standing position); refluxes were considered pathological if >0.5sec.
Results: 1245 patients were included (77% female, mean age 52, mean BMI 25); 69% of the patients had venous symptoms. Predominant CEAP classes were C1 (35%) and C2 (38%). No reflux of the GSV has been detected in 62% of all patients (mean diameter 3.7mm). In case of reflux (38% of cases), mean diameter was 5.6mm and distribution for this group was: 62% <6mm, 30% between 6 and 8 mm and 8% 8mm.
Conclusions: In daily practice of phlebology in France, more than 60% of the patients have competent GSVs. On another hand, in patients with refluxing GSVs (38% of cases), large trunk diameters are infrequent (mean diameter 5.6 mm); hence, foam sclerotherapy remains a credible option in many cases when GSV treatment is necessary.

Perforators are unidirectional and valved – the evidence

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Background: The role of the perforator veins between the deep and superficial venous system of the leg is a critical one. Despite this there continues to be a long standing debate regarding the functional anatomy of these veins in the normal subject. Some say they are unidirectional with valves directing flow from superficial to deep while others claim they are both unidirectional and bidirectional. We review our evidence from two observational studies
Methods: A study of 20 normal subjects confirmed not to have superficial or deep reflux were examined by ultrasound to characterize leg perforators for location, size and function with a variety of augmentations, postures and exercise.
A study of 6 normal subjects using retrograde resin casting venography in amputated limbs previously examined by ultrasound for location of perforators and their function onaugmentation. The resin caste perforators were examined for their connections and with light microscopy for valves and their orientation.
Results: In the 20 normal limbs there were 13 (median, range 8-21) perforators per limb. Of 283 perforators all were competent, unidirectional from superficial to deep with all manuvers and postures. Valves were identified only at the ankle in larger short perforators.
The 6 resin castes showed all perforators to have valves (1-4) oriented for flow from superficial to deep. These perforators also had multiple side branches with competent valves.
Conclusions: In normal lower limbs, defined as those in which there is no superficial and deep venous disease, all perforators are competent with valves directing flow from the superficial to deep.

Obesity, chronic venous insufficiency and the anatomy of the popliteal fossa

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Background: Obesity increases venous reflux resulting in more severe clinical venous disease. Weight loss following bariatric surgery improves the skin manifestations associated with CVI. However, some obese subjects with skin changes typical of CVI have no venous reflux. Their skin changes have been attributed to popliteal vein compression inducing venous hypertension. Obese subjects have reduced mobility, changes in gait and increased hyperextension on standing and walking. We are exploring the differences in the popliteal fossa as a result of obesity that may predispose to this.
Methods: We are comparing the CT appearances of the popliteal fossa in a cohort of obese (BMI >30) and non-obese subjects (BMI <25). Alongside this, we are performing ultrasound examination of the popliteal vein and related structures in phases of walking and standing in cohorts of obese and non-obese subjects, with and without CVI.
Results: There are soft tissue changes affecting the distribution and amount of fat and muscle that may impinge on the popliteal vein. With ultrasound, popliteal vein compression with hyperextension is seen commonly in obesity but includes limbs with and without skin changes suggestive of Class 4 Clinical C_{EAP}.
Conclusions: Obesity results in several complex changes in the popliteal fossa, which may contribute to popliteal vein compression. The relationship of these factors to severity of skin changes of CVI needs to be established.

Ultrasonic vein angiography in complicated CVI cases

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Background: Duplex angioscanning is currently considered by all surgeons as the primary method of instrumental diagnosis of various forms of chronic venous insufficiency. It gives detailed information about the state of the deep, superficial and communicating veins and solves issues of medical tactics in the vast majority of patients. The efficiency and diagnostic accuracy of angioscanning decrease with lymphatic insufficiency (ultrasonic beam scattering due to the accumulation of fluid in the subcutaneous tissue), and in patients who are overweight.
Methods: The suggested method of contrast ultrasound examinations of CVI patients is performed by an ultrasonic scanner with color flow mapping, using a linear sensor in the frequency range of 6 to 12 MHz. An enhanced echo signal usually remained for 1-2 minutes, so in some cases it

was necessary to reintroduce "Levovist" contrast media. Complications after the administration of contrast material have not been seen. We have examined 20 patients with complicated forms of varicose vein and post-thrombotic disease. All patients had significant lower limb lymphedema. All the patient examinations were first performed by conventional ultrasound procedure, and then - with the "Levovist" echo-contrast agent.
Results: In 12 varicose patients in trophic disorder stage and severe edema - ultrasonic angiography revealed perforating veins in the femoral and crural region, which with conventional ultrasound were not detected. In 1 post-thrombotic patient, asymptomatic non-occlusive thrombus of the superficial femoral vein was detected in the Hunter channel with contrast material. In 7 cases popliteal recanalization in common and superficial femoral veins could be seen, which in conventional ultrasound was not detected because of marked edema.
Conclusions: Based on these data we can conclude that Ultrasonic Angiography with contrast media is indicated in patients with complicated forms of CVI. It significantly improves the visualization of the perforating veins of the calf and thigh, as well as the deep veins in "difficult" anatomical areas.

Early ultra-sonographic findings after venous sclerotherapy: an ultrasound guided description of the post-foam sclerotherapy sign

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Background: To describe the short term ultra-sonographic findings in patients submitted to foam sclerotherapy aiming to avoid misunderstandings in post-procedural Duplex Ultrasound. To propose foam sclerotherapy color codification in the Duplex Ultrasound universal report.
Methods: After a formal literature review of post-sclerotherapy follow-up, we studied 260 patients in time lapse of 1 to 4 weeks. Thereafter, we proceed to record the findings. Finally we continued to represent the findings in the universal Duplex Ultrasound report.
Results: Our findings suggest that echo-lucent material, non-compressibility and absence of pain at compression are always present after foam sclerotherapy and they should be always looked at DUS after foam sclerotherapy. Our group suggests that the combination of these characteristics should have a universal name: the post-Foam Sclerotherapy Sign. In addition to the post sclerotherapy sign we found that sclerotherapy should have another color in the Duplex Ultrasound report for avoiding misdiagnosis.
Conclusions: The post-sclerotherapy sign is a reliable tool for differentiate between acute vein thrombosis and foam sclerotherapy. Searching for the characteristics of the sign in post-procedural Duplex Ultrasound could help other physicians to make an accurate diagnosis and avoid misunderstandings. Foam sclerotherapy should have a special color codification in the Duplex Ultrasound report in order to differentiate it from other diagnosis.

Ultrasound estimates of the ejected volume in the calf muscle pump

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Background: A simplified model of the calf muscle pump (CMP) and the Vasculab manoeuvre (VA), evoking considerable centripetal flow in leg veins, were assessed to evaluate the CMP by Duplex ultrasound (DUS). The model assumes that the gastrocnemius veins (GVs) provide a CMP global estimate. The ejected volume (EV) is the calf expelled blood during VA. The aim of our work was to assess the CMP EV through two measuring methods.
Methods: 7 consecutive patients with and without venous disease (**13** lower limbs,$3C_0$,$7C_1$,$2C_2$,$1C_3$), underwent DUS+VA and the EV of CMP was measured by means of two different methods:
1st method: EV-**velocimetry-estimate** (EV_v) in the popliteal vein (PV), through the cross-sectional area times the mean velocity and the time-length of the signal.
2nd method: EV-**geometric-estimate** in the CMP (EV_g).
GVs volume was computed from multiple cross-sectional areas and lengths of GVs segments.
By DUS imaging the GVs vertical extension (PL) and their contraction length (CL) were measured. The EV-geometric-estimate in the GVs was computed multiplying the GVs volume by the CL/PL ratio.
Multiplying then by the areas ratio PV/GV, the last estimate was reported to the popliteal vein, EV_g.
Dividing estimates from both methods by the weight, the analogous values $\mathbf{wEV_v}$ and $\mathbf{wEV_g}$ in ml/Kg were finally got.
Results: Data collected (mean±standard deviation) were the following:
$\mathbf{EV_v}$ 30±40 ml, $\mathbf{wEV_v}$ 0.5±0.5 ml/Kg for velocimetry;
$\mathbf{EV_g}$ 14±13 ml, $\mathbf{wEV_g}$ 0.22±0.18 ml/Kg for the geometric method.
Regression analysis provided the following relationship: $\mathbf{wEV_v=2.82\times wEV_g-0.12}$, where the (non-dimensional) regression coefficient 2.82 was a **constant conversion factor** between the two methods. The correlation coefficients was 0.90, while the explained variance was 81%.
Conclusions: Two methods were assessed to estimate the CMP EV: the simpler velocimetry method and the more time consuming geometrical method; the EVg of CMP may be employed in a comprehensive CMP study. Both methods measured the same blood volume up to a multiplying factor and showed their internal consistence. Validation of these DUS-based methods *vs.* air plethysmography is the necessary next step.

The non-dimensional flow-length number in ultrasound venous hemodynamics

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Background: The Buckingham PI theorem, generally used for the non-dimensional analysis in fluid-dynamics, was adopted to find a meaningful non-dimensional number for venous hemodynamics, named the "Flow-Length" (FL).
Methods: FL was defined as the mean velocity (vmean) multiplied by the time length of flow (T) and divided by the diameter of the vessel (d).FL=vmeanT/ dFL answers to the question: how many diameters did the fluid cover in the time length of flow? FL was compared to other well-known non-dimensional numbers as the Froude(Fr) and the Reynolds (Re) numbers. Both numbers have critical points, Fr 1and Re 3000, which are threshold values to enter a different flow regimen.9 consecutive patients (3M 6F) signed an informed consent to undergo non-invasive measurements during an ordinary ultrasound examination for symptoms of venous origin. Measurements were performed on 13 lower limbs (5 mono, 4 bilateral, 1C0 8C2 2C3 1C5 1C6) on the common femoral (CFV) and popliteal (PV) veins (11CFV, 13PV), gathering the max and min venous diameters and velocities in systole and diastole. The equivalent circular diameter d was computed from the max an min values, while vmean was computed from the min and max velocities in each period T.Values were reported as mean standard error of the mean. A linear regression analysis Fr *vs.* FL and Re *vs.* FL was performed,

extrapolating the used data out of the range to preview the FL critical points corresponding to Fr and Re. A null intercept constraint was set in both analyses.
Results: CVFs PVs were all healthy veins, without diastolic reflux. Other results: Area=1,63 0.13 cm^2, d=1,41 0,06 cm, vmean=110 30 cm s-1, T=1,3 0,2 s.Fr *vs.* FL showed a strict linear relationship: Fr=0,031 FL. R=0,62. FL critical point ~32 for Fr=1.Re *vs.* FL: Re=48,08 FL, while R=0,65. FL critical point ~62 for Re=3000.
Conclusions: Theoretically FL has a similar structure than the Froude number, thus the observed linear relationship.FL has a much simpler mathematical expression than Fr and Re and could be used as a substitute of Fr, adopting 32 as critical value to quick flow, and Re using 62 as critical value to a turbulent regimen.

New ultrasound criterion for differentiation between GSV and AASV

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Background: To find new ultrasound differentiation criteria between GSV and AASV, in cases where AASV substitutes hypoplastic GSV.
Methods: 118 varicose limbs with dilated single saphenous trunk (SST) joining SFJ were selected following the results of duplex ultrasonography. SST positioning relative to the deep femoral vessels axis was determined in transverse ultrasound scan. The length of SST was determined by a six-point scale, where one point equaled one third of the thigh or leg length. SST upper posterio-medial tributary (UPMT) was found and the distance from its entry to SFJ was identified.
Results: In 52 (44.1%) cases SST was positioned medially to the deep femoral vessels axis and was identified as GSV, in 55 (46.1%) cases – over the deep femoral vessels and was identified as AASV. In 11 (9.3%) cases SST was in-between, which prevented its unambiguous identification.
No significant difference was found between the total lengths of GSV and AASV. SFJ to UPMT segment length comprised 56.9±19.8 mm for GSV and 15.1±7.0 mm for AASV ($P<0.00001$). We propose using the segment length between SFJ and UPMT as a SST differentiation criterion: the trunk would be defined as AASV at values beyond 40 mm and as GSV at larger values. Thus, we defined the SST in the group with SST in-between position as GSV in 6 (5.1%) cases and as AASV in 5 (4.2%) cases.
Conclusions: SFJ to UPMT venous segment length allows distinguishing GSV from AASV in cases of upper GSV hypoplasia and is clinically valuable in 9.3±2.7% cases.

Ultrasound avaliation of distance variation in tributaries at the saphenofemoral junction

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Background: Surgical treatment of saphenous vein insufficiency depends on the adequate treatment of the saphenofemoral junction, both in stripping and in endoablative techniques. In the endoablative techniques, inadequate treatment of the saphenofemoral junction can lead to complications such as deep venous thrombosis, endoheat induced thrombosis or recanalizations. The guidelines recommend initiating ablation of the large saphenous vein 1 cm distal from the confluence with the superficial epigastric vein or 2 cm distal from the saphenous femoral junction when the epigastric vein is not visualized. However, some groups defend the thermoablation of the great saphenous vein from point 0 of the saphenofemoral junction (laser crossectomy).
Methods: 62 patients (119 saphenofemoral junction) submitted to ultrasound evaluation of the venous system were included in the study. All patients underwent complete duplex examination of the venous system. Saphenofemoral junction diameter, as well as the distance from the first tributary to the common femoral vein in the anterior and posterior walls of the great saphenous vein was measured in horizontal dorsal decubitus and in orthostasis.
Results: Out of 62 patients, 15 were male and 47 were female. The mean age of patients was 49.73 (range 25 to 97 years). In the horizontal dorsal decubitus position, the median diameter of the saphenofemoral junction was 0.52 cm (range 0.21 to 1.17 cm), the mean distance from the first tributary in the anterior wall was 1.06 cm (range 0.32 to 2.38 cm) and the posterior wall was 0.54 cm (range 0 to 1.52 cm). In the orthostasis position, the mean diameter of the saphenofemoral junction was 0.60 cm (range 0.28 to 1.63 cm), the mean distance from the first on the anterior wall was 1.26 cm (range 0.39 to 2.83 cm) and the posterior wall was 0.68 cm (range 0 to 2.25 cm).
Conclusions: The optimal point of ablation of the saphenofemoral junction is still unknown, in order to avoid complications such as deep venous thrombosis, EHIT or recanalizations. The better understanding of the crossa tributaries and their relation to the patient's posture may help us to better treat the saphenofemoral junction.

LYMPHATIC

What about the lymphatics?

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Background: To increase awarewness of the importance of the lymphatic system during venous system intervention.
Methods: Descriptive account of the lymphatic system and its association physically and functionally with the venous system.
Results: Veins and Lymphatics Drain the tissues. Specifically the lymphatics carry wastes, large molecules, inflammatory mediators, cytokines, adipogenic factors and fluids. Every thing which leaks from the vascular system is taken up and removed by the lymphatics. There is little or no re-apsorption into the venous system - except within the lymph nodes (if they are present). Each persons lymphatic system is unique, structually, positionally and functionally. Our lymphatic systems often are nothing like those seen in stylised diagrams in text books as recent imaging studies with ICG have shown. We know those who develop lymphoedema their lymphatic system may already be working at or near capacity or may not have a great pumping pressure even prior to interventions such as cancer treatment. The reason is an underlying primary component to many apparently secondary lymphoedemas. We also know many lymphatics are located within/near the major veins (adventitial/periadventitia) and near the deep fascia. We are aware that lymphatic system dysfunction leads to lymphoedema, starting initially as a fluid accumulation and progressing through fatty and fibrous stages. We know lymphoedema is a chronic inflammatory process and we are all aware of the impact of this on cell health.
Conclusions: We often still ignore the presence and critical role of the lymphatic system and of how minimising damage to it and optimising its function can gain better patient outcomes when the venous system is in failure. We must recognise the critical role of the lymphatics, attempt to visualise and protect them during any venous system intervention. We must also look at improving lymphatic system function when the venous system is dysfunctional. We must work together side by side as are the lymphatics and veins with a target of holistic assessment and followup care.

Self care for filarial lymphoedema in remote locations

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Background: While India's Program for Elimination of Filariasis (PELF) is showing success of Mass Drug Administration (MDA), the accompanying Morbidity Management Program - which entails treatment for those having Lymphoedema has still to deliver. We have been attempting to provide mass trainning for patients with Lympjhoedema in Rural areas whereby they shall take care of their affected limbs themselves through leg washing as well as self bandaging
Methods: The video will demonstrate imparting instructions to patients during a camp held in 2015 in a community Health Center located in Sitapur district, Uttar Pradesh India.
Over 50 patients were initially assessed for disaese staging, asked to wash, given Penicillin and then provided bandage sets with demonstration of how to tie the same. Later follow-up showed results little different to those who were managed in a tertiary care hospital.
Repeat camps are being conducted now in other areas.

CDP and pharmacological therapy in lymphedema compex and complicated patients

Domenico Corda

This work is based on our experience that's the treatment of lymphoedema out-patients.
Since 2000 our teams have been treating patients with elephantiasis complicated by serious cutaneous lesions caused by infections which for the large part are bacterial infections and occasionally are fungal infections. In general, infections in these patients are chronic and manifest in two ways:
a. persistent chronic subclinical infection.
b. persistent chronic subclinical infection with intermittent flare-ups.
As we know lymphedema is a chronic disease of Extra Cellular Matrix (ECM). In chronic and fibrotic lymphoedema, nutrients and drugs' diffusion through the ECM is limited by the closure of pre-lymphatic channels. The lymphatic stasis produces a chronic inflammation that become a optimum pabulum for bacteria; several acute and recurrent infections appear until chronic persistent infections. When we encounter these lesions, we carry out a skin swab and sometimes a biopsy to investigate whether there are micro-organisms or because we suspect there may be a malignant/cancerous degeneration. Very rarely, with these tests, we find streptococcus and occasionally staphylococcus. What we do find is myriad types of bacteria, often originating in the intestines. This information is in line with an extremely interesting study carried out some years ago by Professor Olzewski, in which he demonstrated the presence of numerous and assorted bacteria in tissues affected by lymphostasis. In lymphedema patients we must also consider that they are generally immunosuppressed, at least at a locoregional level. Many of these patients have been treated in infective disease units without, however, permanent or resolvent results. These patients are not generally treated by lymph-therapy services precisely because they present serious lesions and infections. We know that lymphostasis blocks correct circulation of nutrients in the extracellular matrix. Without CDP and above all without compression therapy the interstitial stasis is not reduced. In 19 years we have treated about 600 lymphoedema patients in stage 3 (according to ISL lymphoedema clinical stadiation) with their infections and with their cutaneous complications. The association of CDP and pharmacological therapy is a silver bullet. Above all, compression therapy leads to the reduction in interstitial lymphatic hypertension and the resumption of an improved circulation of substances in the extracellular matrix, be they antibiotics, anti-inflammatories, lymphtropic medication such as melilotus and other substances. In the last twenty years, CDP and Pharmacological therapy permitted the healing of the wounds, the healing of the infection with the reduction of their relapses and the maintenaince of the decongestion with a recovery of a normal tissue trophism.

Lymphoedema: a holistic approach

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Background: Lymphoedema results when the collection and return of lymphatic fluid is inadequate to keep up with production and distribution. Traditional treatment has centred on reducing accumulation of fluid by compressing the limb and speeding drainage by manual manipulation of tissues and lymph nodes.
There are very few medications that can speed the removal of lymphatic fluid but proteases such as Bromelain can contribute to breakdown of proteins in lymph to assist in its fluidity and some herbs can decrease vessel permeability, decreasing lymph leakage into tissues.

These include dietary and lifestyle factors which are not necessarily intuitive therefore good explanation and assistance to patients is required.
Methods: In recent years more attention has been paid to methods to decrease production of lymphatic fluid and this seems to be an extremely useful adjunct in lymphoedema management. There are many factors influencing fluid production that have been hitherto ignored but many of these are within the patient's control.
Results: Review of the literature reveals that education for patients with lymphoedema can be expanded to include advice regarding how to minimise fluid production via the gut, where the greater proportion of the lymphatic system resides, through reducing the load of long chain fatty acids and other chemicals that require significant metabolism, as well as those chemicals that are inflammatory in nature. Furthermore improving the function of the immune system (also overrepresented in the gut) and cellular metabolism may reduce fluid production.
Conclusions: Lifestyle modifications, especially dietary changes, have been shown to be of value in optimising the management of lymphoedema.

Towards an ideal pump for lymphoedema

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Background: Pumps for Lymphatic and Venous problems have had a chequered history. A few find it to be an essential component of every prescription, while some consider them as dangerous and never to be used. Working with pumps for over 37 years, we summarise our outcomes. Based on these we discuss what we feel could be the ideal pump.
Study Objectives: To assess short (<7 days) and long term (>15 days) results from different compression therapy options including pumps.
Methods: Non-randomized retrospective study of outcomes collated from EMR. Patients were classified to three groups based on the compression mode provided at the clinic. These were
A. Simple pump, MLD, crepe bandage and stockings, (Before 2010)
B. Simple pump and short stretch bandages (2011-2013)
C. Slow cycle sequential pump and short stretch bandages. (2014 -mid 2016)
All patients received counselling, skin care and antibiotics especially long term Benzathine Penicillin. Continued home care was emphasized but not all could afford purchase of pump especially the more expensive sequential one.
Improvements criteria was change in percentage Limb Volume in comparison to normal besides attacks of ADLA and general features.
Results: Total 543 patients in database. Short term results available for 161 and long term for 87 (average follow-up of 6 months). Group C outcomes significantly better than Group A in the short term. No significant difference between long term outcomes which averaged 60%. All recurrences and less than ideal outcomes were related to poor adherence to continued selfcare at home. Managing and preventing infection is more important than compresssion. Some complications due to incorrect use of pumps and bandages were noted.
Conclusions: Long term home care is the key to Lymphoedema management where garments, bandages and pumps - all have a role. Sequential pumps work better than simple pumps but safety as well as costs are a hindrance. Time settings may vary as per individual needs, but most pumps are relatively inflexible. We did not find problems related to high pressures.

Effects of intermittent pneumatic compression treatment on clinical outcomes and biochemical markers in patients at low mobility with lower limbs oedema: a pilot, randomized, controlled trial.

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Background: Aim of this study was to evaluate the effects of intermittent pneumatic compression (IPC) on patients at low mobility affected by oedema of the lower limbs.
Methods: A pilot, single blinded, randomized, controlled clinical trial was performed. Sixty patients (age=58.4±9y.o.; males, N.=14) were randomly allocated in a group undergoing one-month period of an in-home cycle of IPC and in a control group (C). Legs oedema was evaluated by measuring: i) Sub-cutaneous thickness (SCT) ii) Circumferences (Cir) iii) Volumes (V). Ankle range of motion (ROM), Quality of Life (QoL) and pool of plasma inflammatory markers (PIM) were also assesse.
Results: SCT and Cir significantly improved in IPC group compared to C ($P<0.0001$ and $P<0.001$). A significant improvement was reported in IPC group Volume ($P<0.0001$), differently from the C, where a significant increase was reported ($P<0.0001$). Following the oedema decrease, a significant improvement in ROM was detected in IPC group ($P<0.0001$). As for the QoL, only the IPC group showed a significant improvement with regard to physical activity ($P<0.05$), general health ($P<0.004$), vitality ($P<0.02$) and mental health ($P<0.01$). For PIM in the IPC group a number of differences of statistical significance were revealed (G-CSF, IFN-a2, IFN-g, IL-17, and VEGF). G-CSF was significantly reduced in the IPC group ($P<0.03$) while in the C it had an opposite attitude.
Conclusions: In a sample of patients at reduced mobility with legs oedema, IPC treatment was effective in reducing the oedema, improving the ankle ROM and in determining a positive impact on QoL together with a modulation of some PIM.

Extreme lymphoedema of the lower extremity

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Background: Over the last period of time we have seen an overproportionally high number of patients with a morbid lymphoedema in our clinical practice. This rise can be explained by an increase of heavily obese patients over the last years. Due to low self-esteem, these kind of patients present mostly at a late stage of disease with multiple life-threatening complications, demanding a interdisciplinary and cost- intensive therapeutic approach.
We want to illustrate our therapeutic regime by the example of three patients from our clinic with secondary lymphoedema, stage III-IV, of the lower extremity. Although our surgical colleagues suggested the amputation of the leg as sole therapeutic solution, we managed to reach a stable result with our complex, part conservative, part surgical approach. By that we prevented an amputation despite multiple internistic complications with partial the necessity of intensive care treatment.We were able to discharge our patients with a newly gained self-confidence finally freed from social isolation.
Conclusions: Hence, lymphoedema patients are a challenging patient group demanding an interdisciplinary care team. Through our treatment approach with an interdisciplinary complication management, the patients´ wish of preventing an amputation could be fulfilled.

Treatment of patients with severe lower limb lymphedema

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[1]Major Vessels Department; [2]Department of Radiation and Functional Diagnostics, SI Institute of Surgery and Transplantology named after O.O. Shalimov, Kyiv, Ukraine

Background: The aim of our study was to improve treatment results in patients with severe lower limb lymphedema by using complex treatment based on a detailed study of lymphedema pathogenesis.
Methods: Department of Surgery of Major Vessels has an experience of treatment of more than 800 patients with different types of lower and upper limbs lymphedema, in 197 of the patients severe forms of lymphedema were diagnosed. Severe forms of lymphedema were characterized by bad results of conservative treatment caused by severe fibrosis of the skin and subcutaneous tissue.
Patients underwent an ultrasound examination (US) of the lower extremities and radionuclide phlebolymphography.
Results: Approaches and methods of treatment depended on the type of lymphatic system lesions and the time interval. In 1989-2000 the main treatment method was a comprehensive approach with a focus on surgery, including the lymphovenous and nodulovenous anasthomosis formation and resection plastic operations. In 2000-2016 the differentiated approach in treatment with lipo-fibroaspiration and reconstructive surgery. Complex treatment of lymphedema included lymphatic drainage and compression treatment. Satisfactory results were obtained in 74% of patients.
Conclusions: Lymphedema is associated with irreversible changes in the lymphatic system, and it is difficult to develop radical treatment, so further research in this complicated problem is needed.

Lymphangitis and cellulitis in venous insufficiency C E A P C6

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Background: Infectious Lymphangitis occurs when bacteria or viruses enter the lymphatic channels. They may enter through an injury, wound or from an existing infection.
Background: Female of forty-one years old with a medical history of morbid obesity, Chronic Venous Insufficiency diagnosed 11 years ago, right D.V.T. 8 years ago and right venous ulcer with 6 years of evolution associated with depressive disorder.
Started with the current condition one year ago with the progressive increase in volumen in lower limbs. Since six months with pain and increased right perimetry associated with Ulcer in the leg, yellow secretion and bad smell. In the last three months with a higher increase in volumen in the lower right limb in adition to a second ulcer with purulent and fetid secretion that causes immobility.
I came as a second medical opinion because another colleague had offered to treat it only with a radical disarticulation. I found a patient with BMI 58, tegument pallor, fever, lower limbs with phlebedema, lymphedema, asymmetric perimetry of rigth predominance with 103/97/53 centimeters, lymph nodes, two huge ulcers in the leg, abscess in heel, necrosis and abundant fetid secretion.
Received treatment with antibiotics, anti-inflamatory, anticoagulation, surgical debridement, abscess drainage and compressive therapy.
Conclusions: It was possible to reduce perimetry by more 60% and infection's control during 9 days intra-hospital treatment and outpatient management with elastocompress and deambulation, obtaining total cicatrization in 71 days. Following considering the elastocompressive therapy as the best therapeutic strategy in Lymphatic and Venous disorders.

The significance of a questionnaire of quality of life for evaluation of the efficacy of treatment in patients with secondary lymphoedema

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Background: This study surveys the quality of life of patients with secondary lymphoedema of the upper extremity and the overall development of their treatment. It presents a short overview of the current state of this problematic, the anatomy of the lymphatic system, the etiology of lymphoedema and its treatment and also focus on the issues of breast carcinoma. The questionnaire of the quality of life and its repeated completion may undoubtedly serve as a guideline for the improvement of the therapeutic process in patients with secondary lymphoedema of the upper extremity.
Methods: The main goal of this study was to select a suitable and in clinical practice easily feasible questionnaire for the evaluation of both partial and definite effects of the complete decongestive therapy after mastectomy. The questionnaire of choice for obtaining required data for the statistic analysis became the British Keeley Lymphoedema Quality of Life Tool comprising 21 questions.
Thius study has an Ethisc Approval from local Czech authorities.
Results: A randomized group of 30 patients treated in the Center for Dermatologic Angiology in Prague with secondary lymphoedema of the upper extremity was chosen for this study. Statistically analyzed and evaluated data from the questionnaire confirmed anticipated goals and hypothesis.
Conclusions: Based on our results we can conclude that The British Keeley Lymphoedema Quality of Life Tool proved to be a suitable and easily applicable tool for determining the effect of decongestive therapy in patients with secondary lymphoedema of the upper extremity.
In our hands this questionnaire seems to be a very important part of the complex evaluation of the lymphotherapy treatment. In fact, the mere measuring of circumferences of the extremity did not in any way reflect either aesthetic effect nor improved physiological function of treated subjects.

ENDOVENOUS INTERVENTIONS AND SURGERY

Laser crossectomy: 10 year results

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Background: The original description of varicose vein laser surgery recommends to leave a 2 cm long SFJ patent. Our aim was to close the SFJ or to leave a shorter stump.
Methods: 1483 saphenous vein varicosities were treated. The diameter of the saphenous veins (GSV 82.8%, SSV 12.5% and AASV 4.5%) was between 4 and 32 mm. VCSS 6.3.
The tip of the laser fibre was placed near the SFJ: in the first year 2.0 cm, later 1.0 cm and in the last 4 years 0.5 cm from the femoral vein. In these cases, more cold tumescent solution (10 ml/cm) was injected around the 3 cm long SFJ part than around the periphelral GSV (5 ml/cm). The aim of this greater amount was the more complete compression of the junction. LMWH was given to every pateint for 5 days.
Results: Using this modified method, in 61% of the cases occlusion of the SFJ was fluxh with the femoral vein. With this technique our early recurrency rate dropped from 13.8 to 0.6% in the first 2 years. In 58% (861 cases) the operated legs could be followed for longer than one year (mean 3.5). Recurrent varicosity was found in 92 cases (10.7%)
Conclusions: Laser treatment of the SFJ near the femoral vein seems suitable in any varicose vein case and results in a lower recurrency rate.

Pattern of thermal spread and charcoal formation from rfitt endovenous catheter using continuous and pulsed energy: using a porcine liver model

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Background: Endovenous thermal ablation is the treatment for varicose veins arising from truncal reflux. The aim was to investigate the pattern of thermal spread from an RFiTT catheter at different powers, and to contrast the thermal spread of continuous and pulsed energy.
Methods: An RFiTT catheter was placed on the surface of the liver, with saline, under glass following our previous protocol[1]. The catheter was set at a power of 8, 10, 15, 20 and 25W and allowed to heat the surrounding liver continuously until a total of 150J was achieved. Thermal spread was recorded using burst photography at 5fps, and area calculated using mapping software. The model was repeated pulsing the energy 1 second on 5 seconds off at 8W until 150J was delivered.
Results: Thermal spread was compared against the energy delivered. Increasing power led to an increased rate of spread. Heating continuously at 8W and 10W, with the same energy resulting in a smaller area suggesting some cooling effect. Pulsing caused reduced thermal spread compared to continuous energy, plateauing at 150J. Carbonization was only found at power over 10W.
Conclusions: 8W and 10W power do not form charcoalization but show a lower rate of thermal spread and lower total area of ablation. As no carbonization was observed, this reduced thermal spread may be optimal in practice, because of reduced sticking of the catheter. These results, and repeating this with other devices, will help to guide optimal power levels for other thermoablation devices in the future.

The hedgehog technique: early results of thermoablation treatment of complex, recurrent neovascularized vein segments using multiple ultrasound-guided access cannulae

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Background: Neovascularization is a contributory cause of varicose vein recurrence. Treatment is challenging because of segment tortuosity and fibrous web formation. Surgical re-exploration and ultrasound-guided foam sclerotherapy (UGFS) are invasive and of limited effectiveness. We propose thermoablation as an alternative using a modification of a technique originally intended for treatment of perforator vein reflux.
Methods: The technique is based on a previously described method for access and treatment of refluxing perforators[1]. Single or multiple vein segments identified by B-mode ultrasound in a parasagittal plane are accessed using a suitable intravenous cannula. A Luer-Lok cap is placed over the cannula hub to prevent backbleeding. As many segments as possible are cannulated until all have been accessed. The confined area can then be infiltrated with copious tumescent local anaesthesia to avoid segments becoming obscured during treatment if accessed individually. Endovenous Laser Ablation (EVLA) is then performed via each cannula delivering 70-80 J/cm linear endovenous energy density to each segment.
Results: Eighteen patients have been treated to date; 15 groin, 2 thigh strip track, and one popliteal fossa recurrence. Three required a single segment puncture, five had two, four; three, four cases had four punctures and two, five. Follow-up range is 1-38 months, all segments are closed and there have been no significant complications.
Conclusions: Re-exploration surgery is invasive, difficult and fraught with complications. UGFS is therefore appealing but unreliable in view of the difficulty in post procedural compression especially in the groin. Our preliminary results suggest that EVLA is a reliable alternative technique.

Endovenous laser ablation of the saphenous veins more than 2 cm of the diameter

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Background: The aim of this study was to investigate the results of endovenous laser ablations (EVLA) of the saphenous veins more than 2 cm of the diameter.
Methods: Prospective noncomparative study includes 112 patients who were operated from November 2014 until September 2016 and they had 126 EVLA of the great saphenous veins (GSV). We used tumescent anesthesia, 1470 nm laser, radial fibers and special pull-back device. The diameter of the veins close to sapheno-femoral junction was from 21 to 43 mm (mean 26±4,3 mm). In all cases we used the power of 6-10 Watts. The linear endovenous energy density in dilated segments was from 83,3 to 142 J/cm. The observation period was from 67 to 440 days (mean 178±37 days). The patients had ultrasound examination the next day, a week later and after 2 and 6 months.
Results: The next day after EVLA 107 (84,9%) of the veins were occluded. In 19 (15,1%) cases the rest lumen in dilated segments was found but it was closed in 15 patients after 7 days. In 4 (3,1%) cases we did

ultrasound-guided foam-form sclerotherapy (UGST). Only in 1 (0,8%) case we found recanalization with pathological reflux. This patient was treated by UGST. There was no necessary to retreat patients by EVLA.
Conclusions: EVLA 1470 nm by radial fibers are really effective also for the veins of the diameter more than 2 cm. We have found occlusion of GSV of 99,2% cases in early follow-up period. In 3,1% of cases UGST has been done.

Dose finding study of laser energy and denaturation of the vein wall during endovenous laser ablation

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Background: Purpose of this study to determine which dose of laser energy can completely destroy the vein wall during EVLA with 1470 nm diode laser and radial fibers.
We performed EVLA in patients with S-type of incompetent GSV. Just after EVLA of GSV we took small segment of extrafascial vein with miniphlebectomy for examination. We used laser 1470 nm and radial fibers, automatic fiber pull-back. We included 61 patients (f=38, m=23), mean age 44.5±11.8y in this study and collected 67 venous segments. Diameter of veins was 6.4±1.2 mm (range 4.0-9.8). We used continuous mode with power 5.7±1.7 W (range 2.9-11.5), pull-back speed 0.7, 1.0 and 1.5 mm/sec, LEED 78.4±21.9 J/cm (range 40-150), EFE 39.9±13.1 J/cm^2 (range 20.5-95.5).
Methods: After miniphlebectomy we performed microscopy and macroscopic evaluation of inner and external layers of the veins. We observed such signs of the vein damage like gummy consistency, thickened wall, reduced caliper, veins lost typical pink color and appeared grayish-white color (external layer) or white color (inner layer). In cases of complete laser damage these changings were uniform, widespread and constant around the whole vein wall circumference. In cases of insufficient severity of these signs, we considered that damage of venous wall was incomplete.
Results: LEED. 1 group LEED ≤60 J/cm, (median 57 J/cm) 17 veins: incomplete damage of venous wall was in 13 cases, complete only in 4 cases. 2 group LEED 61-80 J/cm, (median 71,4 J/cm) 22 veins: incomplete damage of venous wall was in 7 cases, complete in 15 cases. 3 group LEED >80 J/cm, (median 89,9 J/cm) 29 veins: complete damage of the vein wall was observed in all cases. (X^2=29,6, P<0,01).
EFE. 1 group EFE <30 J/cm^2 (median 26,4 J/cm^2) 14 veins: incomplete damage of venous wall was in 12 cases, complete only in 2 cases. 2 group EFE ≥30 J/cm^2 (median 40,9 J/cm^2), 53 veins: incomplete damage of venous wall was in 8 cases, complete in 45 cases. (X^2=26,38, P<0,01). We didn't observe any difference between different types of laser fibers in all energy groups.
Conclusions: For complete damage of venous wall during EVLA 1470 nm with radial fibers it is necessary LEED more than 80 J/cm and EFE – more than 30 J/cm^2.

Comparison of 1470 nm laser and radial 2ring fiber with 1470 nm laser and radial fiber in endovenous laser ablation of saphenous varicose veins

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Background: The aim of this study is to compare the clinical efficacy and safety of two laser fiber types in endovenous laser ablation (EVLA) of saphenous varicose veins of the lower limb.
Methods: From January 2013 to September 2015, 94 patients (94 limbs) with primary varicose veins were randomized into two groups. They were treated with radial fiber and 1470 nm laser in Group 1 (46 limbs) and radial 2ring radial fiber and 1470 nm laser in Group 2 (48 limbs) in order to ablate the saphenous vein. Vein occlusion rates at 1 and 7 days, and 1, 3, 6 and 12 months and incidence of pain in treated region were recorded as primary efficacy and safety endpoints. Postoperative pain, venous clinical severity scores (VCSS) postoperative bruising, adverse events following endovenous laser ablation with both fiber types were recorded as secondary endpoint.
Results: Occlusion rates at 1 day were 100% in both groups, at 7 days, and 3,6 and 12 months were 97.9% in Group 1, and 100% in Group 2. Rates of pain (3% *vs.* 14.8%) were lower in Group 2, but not significantly. The maximum VAS in Group1 and 2 were 6.4 /- 8.4 and 20.5 +/- 17.6, respectively, showing a significant difference (P<0.001). VCSS scores were significantly better in Group 2 at 1 day and 1 week (P<0.001). At 3, 6 and 12 months, no significant differences between the groups were evident.
Conclusions: Endovenous treatment of saphenous vein reflux with either fiber types results in clinical improvement of symptoms and comparable occlusion rates. In the early postoperative period, 2-ring laser fiber seems to remove quality-of-life limitations associated with conventional radial fiber.

Controlled ultrasound-guided tumescent anaesthesia in endovenous laser therapy: comparative study of an original technique with directed hydro-separation approach

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Background: One of the most widely used modern techniques is Endo-venous Laser Ablation EVLA. There is no consensus in the literature neither on the technique, nor on the optimal volume of Tumescent Anaesthesia TA used in EVLA. We aimed to define and assess a new technique of tumescent infiltration and evaluate its influence on perioperative pain and on the volume of TA.
Methods: A prospective comparative study was performed to assess the short-term efficacy and safety of an original technique of tumescence. 102 patients with duplex confirmed Great Saphenous Vein insufficiency were treated unilaterally with EVLA (1470). The patients were divided in two groups. Group A patients applied Classical Tumescent Anaesthesia CTA with multiple injections in peri-venous space. Group B patients had the Controlled Ultrasound-Guided Tumescent Anaesthesia CUGTA. Pain on application of TA during ablation measured using visual analogue scale (VAS) and volume of tumescent was compared in both groups.
Results: Linear transducer is placed perpendicularly (transverse) to venous axe. With saphenous vein centrally positioned, the transducer is rotated 45° inverse clockwise. Next, skin is punctured with needle in plane view always in short axe of the vein in tangential incidence. The first injection is started after reaching the outer limit of the vein wall in order to obtain a rapid hydro-compression; then the needle is intentionally advanced in targeted tissues with a hydro-separation approach to adjascentes structures. There were no significant differences between groups with respect to age and gender. A statistically significant decrease in pain sensation was reported in Group B (P=0,0003). Group B used statistically significant less volume of tumescent liquid than Group A (0,0001) and lower number of punctures. The initial occlusion rate was 100% in both groups. No significant difference was found between the groups in

terms of ecchymosis score. Skin burn did not occur. All patients returned to daily activity within three days.
Conclusions: With appropriate training, the Controlled Ultrasound Guided Tumescent Anaesthesia CUGTA is safe and effective means of reducing peri-operative pain and volume of tumescent anaesthesia.

Difference between morphological changes after endovenous laser ablation by radial fibers with different power but similar linear endovenous energy density

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Background: The aim of our study was to investigate the depth of venous walls' damage after endovenous laser ablation (EVLA) using different power as 5, 7 and 10 Watts but the same linear endovenous energy density (LEED) which was approximately 70 J/cm.
Methods: Prospective comparative morphological blind study included 30 patients whose great saphenous veins were treated by EVLA 1470 nm by radial fibers. The patients were divided into 3 groups for 10 persons. In the 1st group patients were treated by EVLA with power 5 Watts with speed of the fiber traction 0,7 mm/sec (LEED 71,4 J/cm). In the 2nd group the power was 7 Watts with traction speed 1 mm/sec (LEED 70 J/cm). And in the 3rd group the power was 10 Watts and speed of the traction was 1,5 mm/sec (LEED 66,7 J/cm).
Results: The mean depth of the venous walls damage was 122,9 μm in the 1st group, 182,9 μm in the 2nd group and 267 μm in the 3rd group. The coefficient of alteration (relation of the damage depth to the venous wall thickness) was 25,7%, 37,9% and 55% in the 1st, the 2nd and in the 3rd group accordingly (P=0,0001). So in spite of insignificant decreasing of LEED from the 1st to the 3rd group with the increase in the power the depth and coefficient of alteration were statistically risen.
Conclusions: Having used more power (from 5 to 10 Watts) with EVLA at the same LEED the depth of venous wall damage becomes more significant.

Preconditions to the modification of radiofrequency ablation regimen for reducing complications of varicose veins treatment

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Background: Radiofrequency ablation (RFA) can cause the appearance of sensitivity disturbances, due to thermal damage of nerves. These consequences can be explained by the excessive thermal exposure, which goes beyond the vein walls and damages the structures, surrounding the vein. Mathematical modeling is a relevant method for this research because the RFA technology is accompanied by a temperature control in the exposure zone and is deprived of variable factors such as fiber pulling out speed, carbonization, and others.
Methods: An adequacy of the energy level of RFA standard temperature-time mode has been analyzed on the basis of mathematical modeling results. The differential heat equation has been taken as the basis of calculations of the propagation of heat emitted by the catheter on the vessel wall. It has been calculated using finite element method in COMSOL Multiphysics 5.1 software package. The experimental temperature dependencies on a time of the catheter surface were obtained by processing generator monitor readings video records during 30 procedures. The task of modeling the propagation of heat emitted by the catheter on the vessel wall was solved numerically using the differential heat equation. Software package COMSOL Multiphysics 5.1 was used for calculations. The temperature dependences on a time of the RFA exposure were designed for the middle (at a distance of 0.5 mm from the surface of the catheter) and the outer surface (1 mm from the surface of the catheter) of the venous wall for the standard mode of ClosureFast catheter.
Results: It has turned out that the vein wall outer surface heating exceeds 60°C at the 9th second of RFA cycle. This result evidences the energy, generated by the VeneFit device during the standard mode, becomes excessive for veins of small diameter (up to 6 mm) by the middle of the cycle. This study developed of a new energy RFA mode, providing only the effective thermal exposure on the venous vessel during the procedure to avoid undesirable damages.
Conclusions: The optimized temperature-time mode has been offered using mathematical modeling method. Clinical trials are required.

Clinical outcomes of endovascular intervention and open surgery for Budd-Chiari syndrome in a single-center

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Objectives: The study was to evaluate the clinical outcomes of endovascular intervention and open surgery for Budd-Chiari syndrome (BCS).
Methods: 418 patients (219 males, 199 females) of BCS underwent endovascular intervention or open surgery from January 2010 and October 2016. The patients were classified into hepatic vein (HV) occlusion, infra vena cava (IVC) occlusion, combined HV and IVC occlusion. The HV balloon angioplasty and IVC balloon angioplasty were the most common treatments for these patients. Thrombolysis and thrombectomy was applied to patients with IVC thrombus; the surgical bypass was performed in patients with long segment occlusion of IVC.
Results: The mean age of male and female patients was 48.5, 47.4 years. The median follow-up was 48 months (2-84 months). The HV balloon angioplasty was performed in 92 patients; the IVC balloon angioplasty was performed in 259 patients; the thrombolysis and IVC balloon angioplasty were performed in 19 patients; the thrombectomy and IVC balloon angioplasty were performed in 6 patients; the surgical bypass was performed in 12 patients; and the HV and IVC balloon angioplasty was performed in 30 patients. Overall technical success was 427/429 (99.5%). Immediate complications were noted in 10 patients (2.3%). Re-interventions were required in 15 (3.5%). Overall mortality was 6 (1.4%).
Conclusions: Endovascular interventions play an important role in the management of BCS. The thrombectomy and surgical bypass could be applied to treat the patients of complicated BCS.

Phlebogonarthrosis: a clinical and physiopathological reality

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Background: The aim of this study is to establish if there is a connection between gonarthrosis and great saphenous vein (GSV) reflux at the same leg.

The gonarthrosis is defined as chronic degenerative disease of the knee. There are several etiologic mechanisms involved: organic causes, functional disturbances; blood flow disturbances (the arterial theory, the venous theory).
The venous insufficiency may cause on the joint of the knee actions like: osteoporosis, osteophytosis and bone neoformation.
Methods: The study group - patients with gonarthrosis and concomitant varices of the GSV at the same leg. Total number of patients in the study: 19 (8 women and 11 men).
Non-stripping ambulatory surgical treatment of the varicose veins was performed in all cases.
During the procedures the existence of dilated insufficient genicular vein were observed in all cases; those veins were intercepted, sectioned and ligated (the reflux and hyperpresure at their level was eliminated).
Results: Spectacular improvement of the joint symptomatology: disappearance of joint pain-gonalgia (16 cases-84%); significant reduction of pain (3 cases-16%).
Improvement of the imagistic appearance of the gonarthrosis 6 months after the operation without any other concomitant treatment
The complementary treatment was no longer necessary (painkillers, physical therapy).
Conclusions: The importance of the venous factor in a significant number of patients with simultaneous gonarthrosis and varicose veins on the same leg justifies the term *phlebogonarthrosis*.
The pathway from the insufficient GSV through the joint of the knee is the insufficient genicular vein.

What is the best adjunctive treatment for superficial varices when using thermal or mechano-chemical ablation for saphenous veins?

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Thermal ablation techniques such as laser ablation and RF ablation as well as mechanochemical ablation are widely used to treat saphenous trunks and have a low recanalization rate. However, studies of recurrence after varicose veins treatment show that accessory veins and saphenous tributaries are often to the source of development of new varices. How are these best treated?
A commonly used method is to undertake phlebectomies, usually during the same session as the truncal ablation procedure. This is not normally undertaken as an ultrasound guided procedure and has the potential to leave considerable numbers of accessory and tributary veins. In addition, phlebectomy has the disadvantage that skin incision may lead to wound infection and healing problems, including scars. Collateral damage to cutaneous nerves and lymphatic vessels may also arise.
Foam sclerotherapy is also a commonly used adjunctive treatment to thermal ablation. This method has the advantage that it is normally carried out under ultrasound guidance and may be more rigorous in eliminating the accessory veins and saphenous trunks. It has the disadvantage that it may give rise to phlebitis, tender lumps and persistent skin pigmentation.
The method of choice in a particular patient may depend on patient factors as well as the phlebologist's preferences.

SCLEROTHERAPY

Investigating the aetiology of telangiectatic matting

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Background: Telangiectatic matting (TM) is a morphological description referring to vessels with a small diameter of less than 0.2 mm that can appear sporadically or in well-defined patches (hence the term 'matting') mostly on lower limbs. The etiology underlying TM remains to be established. Our study aims to identify risk factors associated with telangiectatic matting (TM).
Methods: This study has two parts. We first retrospectively analyzed the clinical records of consecutive patients to identify risk factors for TM. In the second part, the haemostatic and coagulation profile of a subset of patients with TM were analyzed and compared with controls using standard coagulation tests, platelet function (multiplate impedance aggregometry) and a global assay of coagulation (rotational thromboelastometry, ROTEM).
Results: In 352 consecutive patients, 25 patients had TM (7.1%). All 25 patients were female with the median age of 45 (27-57) years. Significant associations included recurrent epistaxis, easy bruising, hypersensitivity (eczema, hives, hay fever, rhinitis), previous treatment with sclerotherapy or vascular laser for lower limb veins and a family history of telangiectasias. The haemostatic and coagulation profile of 12 patients with TM did not differ significantly (P>0.05) from those without TM.
Conclusions: TM is associated with hypersensitivity and a bleeding tendency. Patients with TM do not have an underlying haemostatic abnormality. Underlying mast cell hyperactivity may contribute to both hypersensitivity and a bleeding tendency and predispose patients to TM. We hope the findings of our study help tailor preventative measures and treatment modalities to control and reduce the incidence of TM.

Foam *versus* liquid in sclerotherapy for telangiectasia: review of literature and new perspective of a randomized clinical trial

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Background: In the sclerotherapy for varicose veins, particularly for the great saphenous vein, the superiority of foam compared to liquid has been established based on numerous studies. However, the use of foam to treat telangiectasia is more controversial. We conducted a bibliographic search on the studies comparing liquid to foam in the C1 (CEAP clinical class) with the objective of evaluating the evidence of the possible superiority of foam in this indication, and then as second objective, to propose if necessary a relevant randomized controlled study protocol. The two sclerosing agents which can be used in the form of foam and marketed in France are polidocanol (POL) or Lauromacrogol 400 and sodium tetradecyl sulphate (TDS).
Methods: We conducted our research on the Cochrane Database of Systematic Reviews, complemented by a research in various databases (Pub Med, Cochrane Library, ScienceDirect, INIST, Web of Science) and a manual search of abstracts from scientific conventions and of unreferenced journals in the databases.
Results: Only one randomized study was found in this indication, a very few other non-randomized studies were published. Several important biases were regularly found.
Faced with our "poor" research findings, we have established a multicentric randomized controlled trial comparing the liquid form and the foam form for POL and TDS in the treatment of telangiectasia. This will be a 4-arm study: 2 liquid arms (one with TDS, the other with POL) and two foam arms (same as TDS and POL), under the auspices of the SFP. The primary endpoint will be efficacy on scanned photos.
400 patients are expected to be included, 100 in each arm. 15 investigators from the SFP have been recruited.
This study is set to start shortly.
Conclusions: Our research findings have confirmed that the studies comparing foam and liquid in the sclerotherapy of telangiectasia are rare. The SFP proposes an extensive randomized multicentric study in this indication.

External vascular lasers *versus* sclerotherapy for lower limb telangiectases

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Background: The role of external vascular lasers in treating lower limb telangiectases remains controversial. This paper reviews the evidence for external beam laser (532nm through to 1064nm) in treating lower limb telangiectases, within the context of the author's experience in sclerotherapy and lasers.
Methods: (1) Pubmed literature search for "lower limb telangiectases lasers"; (2) Clinical audit for lower limb telangiectases treated with energy-based devices (Intense pulse light/ vascular lasers) for patients attending the author's private practice over the period 2018 – 2017.
Results: Pubmed search uncovered 107 citations. Reports were typically of evidence Level 3 (case control, retrospective comparative studies) and level 4 (case series, case control studies). Laser wavelengths: 532nm KTP laser, 575 - 595nm pulsed dye laser and particularly 1064nm Nd:YAG laser. The 1064nm Nd:YAG laser appears most efficacious with some reports suggesting outcome equivalence to sclerotherapy with minimal complications.
The author's clinical audit showed lasers being mostly used in patients with peripheral or generalized essential telangiectases, post-sclerotherapy matting and needle-phobic patients without significant feeder vessel compromise.
Conclusions: For most patients with leg veins, sclerotherapy remains the gold standard. However, vascular lasers can be usefully considered in instances of non-feeder telangiectases, matting and progressive essential telangiectases.

The experience and cosmetic effect to treat telangiectasia and reticular veins of lower limb in China

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Background: The disease of reticular veins and telangiectasis of lower extremity are very common. Regular treatments and medicines are invalid. This research is to study the effect of the combination of sclerother-

apy and the long-Pulsed 1064nm Nd:YAG laser in treatment of reticular veins and telangiectasis of lower extremity in China. We also assessed the safety and clinical efficacy of QS-Nd:YAG laser in the treatment of pigmentation after sclerotherapy.

Methods: From January 2015 to June 2016, excluding deep and superficial veins valve insufficiency of the lower extremity through duplex ultrasonography, 136 cases with simple reticular veins and telangiectasis of the lower extremity were treated with sclerotherapy combined with Nd:YAG 1064nm laser therapy. We evaluated 70 patients with pigmentation. For every patient, part pigmention area treated with a 1064-nm QS-Nd:YAG laser, and the left untreated area as control.

Results: Of the 136 patients: cured in 87 cases, significantly effective in 45 cases, effective in 4 cases, total effective rate is 100%. There were no severe complications in all cases. In terms of 70 patient treated with QS-Nd:YAG laser self-assessment, 80% of the patients treated with Q-switched Nd:YAG laser had excellent results compared to 17% in untreated.

Conclusions: Sclerotherapy and Nd:YAG1064nm laser are for different stages of the treatment process and different caliber of blood vessels. A combination treatment of sclerotherapy and Nd:YAG 1064nm laser for reticular veins and telangiectasia of lower extremity is safe, simple and effective. QS-Nd:YAG laser is effective in the treatment of pigmentation after sclerotherapy.

DERMATHOLOGY AND ULCERS

Early detection of venous microangiopathy by skin capillaroscopy

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Background: Venous microangiopathy is a central pathophysiological event in the development of the cutaneous complications of chronic venous insufficiency (CVI). We investigated the potential of capillaroscopy for the early detection of CVI in patients with Chronic Venous Disorders (CVD).
Methods: Capillaroscopy pictures (magnification X50, CapXview®) were systematically taken from the medial and lateral malleoli of both legs in a series of patients following a spa treatment course for CVI (CEAP «C» class 3 or more in at least one leg). Those pictures were subsequently blindly analyzed, with measurement of the capillary density, and the diameters of the capillary loops and dermal papillae and analyzed according to the CEAP «C» classes.
Results: Twenty-one patients participated: 11 women and 10 men, mean age 70.6+/-6.9 years, 12 of whom had a history of DVT. The CEAP "C" classes of the 42 examined legs were C0-C2: N.=17; C3: N.=10; C4: N.=9 and C5: N.=6. The analysis of capillaroscopy parameters showed a reduction in capillary density (P<0.001), an increase in capillary diameter (P<0.01) and an increase in papillary diameter (P<0.001) with increasing CEAP "C" classes. For all three parameters, changes were more important at the medial malleolus.
Conclusions: These results confirm the importance and early occurrence of the venous cutaneous microangiopathy in CVI patients. Evaluation of the prognostic value of these findings requires further follow-up studies.

Non-invasive laser speckle contrast analysis (LASCA) as an alternative to biopsy in the diagnostic of angina cutis and livedovasculopathy

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Background: Introduction: LASCA visualizes tissue blood perfusion in the microcirculation instantaneously.Livedovasculopathy and Angina cutis are the painful correlate of an impaired microcirculation caused by microthrombosis of the skin capillary system, mostly localized to the feet and often accompanied by ulcerations. The skin shows a typical permanent violaceous netlike pattern (Livedo racemosa) in contrast to the harmless Livedo reticularis. Skin biopsy with detection of hyaline thrombus and perivascular lymphocyte infiltration is the gold standard diagnostic tool for this rare disease (Incidence <1:100.000), but despite of biopsy the reason for microthrombosis remains often unknown.
Methods: After exclusion of makrovascular disorders 15 symptomatic patients were examined with a standardized LASCA procedure including local temperature provocations, all underwent further laboratory investigations.
Results: In all patients local perfusion deficites could be visualized by LASCA with a reliable separation from functional vessel occlusion through temperature provocations. Without biopsy the following underlying prothrombotic disorders could be elucidated: JAK2-positive (V617F) essential thrombocytosis and myelofibrosis, systemic lupus erythematodes, antiphospholipid syndrome and multiple myeloma.
Conclusions: In all current cases biopsies consciously were avoided because of eligible scruples to provocate wound healing disturbances in these non-perfused areas. LASCA is a proof method to separate organic from functional vascular deficits and allows in combination with laboratory to elucidate the reason of microthrombosis.

Assessment of grading of pigmentation in chronic venous insufficiency

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Background: Chronic Venous Insufficiency provokes cutaneous pigmentation of the leg ranging from small regions of mild dyschromia to extensive areas of severe skin darkening. Probably this pigmentation is because of Haemosiderin and melanin.
Methods: Our aim was to grade the severity of pigmentation of verity and assess that how much Haemosiderin and melanin contribute in that. The grading was done as + Few spots, ++ Pigmentation over gaiter area, +++ Pigmentation involving leg and ankle and ++++ Heavily pigmented. A biopsy was taken from pigmented area and it was analyzed with H & E Stain, Perl's stain and IHC for S-100.
Results: Total of 100 patients of symptomatic varicose veins were analyzed of that 23 patients had pigmentation of varying grade. Three patients had +, 13 were ++, 3 were +++ and 4 were ++++. Patients with + pigmentation were clinically less symptomatic and did not have ulcer. Ulcers were present in 7 of ++ 13 patients, 2 of 3 +++ and all 4 patients in Grade IV pigmentation. On H&E stain about 50% showed erythrodiapedesis, 40% biopsies were positive for Haemosiderin on Perl's stain and almost all biopsies were positive for S-100 for Melanin.
Conclusions: Severe grade of pigmentation were correlated with severity of CVI and duration of Disease and almost all biopsies were positive for Melanin deposits while haemosiderin was positive in 40% biopsies.

Efficacy of skin care in medical compression therapy: influence of evening creaming and compression stockings with integrated skin care on the skin barrier

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Background: Monitoring of skin moisture, skin roughness, and transepidermal water loss (TEWL) of the skin at the lower limb under compression therapy in two randomized groups with and without evening skin care and testing of special stockings with integrated skin care. A special textile finishing as emolient with 5% urea (Venotrain micro Balance 1® and its advancement "Venotrain micro Balance 2®, Bauerfeind, Zeulenroda") was compared to medical compression stockings (MCS) without skin care (Venotrain micro®, Bauerfeind).
Methods: Three randomized controlled studies were performed. 1st RCT: healthy volunteers and patients with CVD wore compression stockings, CCL 2 (23mmHg – 32mmHg). Randomization into two groups -with and without evening skin care. 2nd RCT: patients with proven CVD were recruited to test the "Balance 1" and were randomized to test the Balance 1 and MCS without skin care. 3rd RCT: Evaluation of the "Balance 2" on healthy subjects with daily standing of at least 8 hours and identified orthostatic edema. Balance 2 and MCS without skin care were worn consecutively. Measurement of skin moisture, skin roughness, TEWL

before and after the wear period in all cohorts of all three trials. In addition, the volume of the leg was measured in two of the three RCT's.
Results: Transepidermal water loss (TEWL) increased without evening skin care (P<0,05). Skin moisture was improved with skin care (P=0,000) and retained with application of Balance 1 (P=0,08) and Balance 2 (P<0,001). Skin roughness decreased significantly in patients and healthy volunteers with evening skin care, (P<0,05) and stayed unchanged with Balance 1 (P=0,109) and Balance 2 (P=0,002). Volume reduction of the lower leg was achieved by means of the compression stockings in all cohorts of the three RCT's.
Conclusions: The barrier function of the skin is impaired by use of compression therapy Since skin hydration was reduced, waterloss (TEWL) was increased and the roughness of the skin was increased. Both by the application of ointment in the evening and by the use of compression stockings with integrated skin care these undesired side effects of compression stocking are prevented. Consecutive itching of the skin does not occur.

Challenges in the recruitment of patients to chronic venous ulcer studies

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Background: 45% of clinical study delays are related to poor recruitment, a challenge faced by many research nurses. Studies involving patients with chronic venous ulceration (CVU) are often particularly difficult to recruit for due to, stringent inclusion criteria, participant preference and logistics. This project aimed to identify reasons for reduced enrolment of CVU patients to a single center and explore possible interventions to improve recruitment rates.
Methods: CVU patients were identified in the outpatient department and prospectively recruited via an informed consent process to the MOJITO study, a study investigating biomarkers in individuals with CVU.
Results: Over eight months the MOJITO study had a recruitment rate of 23%, (27/113). 69 were male, 44 were female, and the mean age was 63. Of the 49 documented reasons for exclusion to the study, non-attendance to clinical appointments occurred in 14/49 (28%). Healing of ulcer before the follow-up appointment occurred in 13/49 (26%). Ulcers of mixed aetiology occurred in 12/49 (22%), making patients non-eligible for participation. Amongst the patients who were deemed eligible but who declined to participate in the study, the main reasons for doing so included traveling difficulties, and concerns regarding pain experienced during dressing removal.
Conclusions: Recruitment of CVU patients to research studies remains an important challenge and hence the generalizability of the results. A possible, measure to increase recruitment rates includes recruitment of participants from primary care, which may reduce the effects of non-attendance to hospital and identifying patients prior to healing, as well as reducing the burden of excess travel on patients.

Comparison of leg measurements in Indian patients with European standards of below-knee compression stockings

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Background: We feel that morphology of lower limbs in Indian patients is different from that of the European patients. This could be one reason explaining the difficulties of donning of compression stockings made in Europe, their poor compliance and the non-adapted interface pressures for treating chronic venous disorders in Indian patients, especially in case of venous ulcers.
Methods: Comparison of measurements of legs in X male Indian patients and X female Indian patients with European standards of biggest companies of compression stockings
Results: Measurements of legs in 9 points in X male patients and x female patients. Measurements of the right or left legs according to randomization list. These measurements were compared with European standard leg measurements and interesting results were depicted for the very first time comparing Indian and European population leg differences.
Conclusions: The results will be presented during the UIP meeting.

Tolerance of compression for ulcers in a topical environment

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Background: Analyzing efficacy and tolerance for Compression therapy for ulcers in a tropical setting.
Methods: Retrospective analysis of tolerance of various components of compression and care outcomes of lymphoedema and ulcer patients in India.
Care protocol: Patients were first assessed for diagnosis and staging. All were counselled on the treatment plan with emphasis on need of continued home care. Photographs and Circumference measurements were taken for volume assessment. Ulcer assessment was separately done as required. All were given Long term Benzathine Penicillin unless allergic.
Compression therapy choices at initiation was Multi Layer Lymphoedema Bandaging (MLLB) and Intermittent Pneumatic Compression (IPC). Patients carried the same MLLB sets for maintenance at home after 4-7 days. Some could afford continuation of IPC at home. Garments were ordered once limb size was stable. Ulcer patients were not treated any differently except for dressing and avoidance of more expensive MLLB components till the ulcer healed.
Results: Out of 580 total patients, there were 32 with ulcers, with duration ranging between 6 month to 12 years. Size varied from less than a cm, and causing lymphorrhoea, to around 160 sq cm. All ulcers healed completely within 2 to 6 weeks except in two. One failure had deep circumferential scarring but 90% reduction of ulcer size was achieved. The only complete failure had a large weeping ulcer. The desired protocol could not be sustained due to repeated infection.
Conclusions: Ulcers do not affect the compression therapy protocol unless extremely large even in a tropical setting.

Effect of whole-course health education on dressing of patients with lower limb vein ulcer

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Background: To study the effect of holistic health education in dressing change forpatients with venous ulcer of lower extremities.
Methods: To collect 37 patients with venous ulcer of lower extremities that had dressing change in West China Hospital of Sichuan University during June 2016 to May 2017. These patients were randomly

divided into 2 groups. The routine group had 19 members, The control group had 18 members. The routine group carried on moist wound healing therapy and pressure treatment in dressing change with some regular health education.The control group carried on moist wound healing therapy and pressure treatment in dressing change. Besides,we promoted holistic health education in patients and their family members for control group.

Results: 15 patients of the routine group were cured, 3 patients withdrew, and 1 patient was failed. The day of dressing change was (83.22 + 9.60) days with a total cost of 6756.32 CNY. In the control group, 17 patients were cured and 1 failed. The dressing change took (67.16 + 7.40) days with a cost of 4,696.56 CNY.

Conclusions: The holistic health education can shorten the healing time of lower limb venous ulcer, reduce the recurrence of ulcer, improve the confidence of the patients and their family, reduce the cost, and improve the satisfaction of patients.

VENOUS THROMBOEMBOLISM

Death from pulmonary embolism – how long does it take for heparin to become effective?

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Pulmonary embolism is a common cause of death in hospital practice. Prevention of death is dependent on early diagnosis and treatment. The main method of treatment is anticoagulation with heparin which has been shown to be effective over many years. The role of IVC filters remains to be established in this condition.

A question most commonly asked by lawyers rather than doctors is 'How long does it take before heparin treatment will prevent death from pulmonary embolism?' Low molecular weight heparins take less than 30 minutes to achieve an effective plasma level after subcutaneous injection. Is this sufficient to protect patients from a fatal outcome or does it take several days for this treatment to become effective?

I collaborated with the RIETE database custodians and statisticians and compiled a model to quantify the answer to this question. The information concerning the outcome of treatment in 15,002 was studied.

Two methods of analysis were used, including graphical representation of the data with calculation of regression lines. The average mortality for the patient cohort was calculated in the first 36 hours, as patients entered the registry. This was compared with mortality for days 2-7 in the heparin treated and in the patients who received no anticoagulant drug. A graphical solution showed that the mortality in these two epochs was identical. Standardized mortalities were also calculated for two epochs (first 36 hours and days 2-4) using Poisson technique. For patients treated with low molecular weight heparin, mortality was numerically lower in the first 36 hours, but were not statistically different (First 36 hours, N.=96, mortality per 10,000 patient days: 32 95% CI 25-40, days 2-4 N.=97, mortality 22 95%CI 18-27). Overlapping confidence intervals show that, even in this large study, the mortality in these two period is no statistically different. All analyses indicate that the time taken between injection and onset of efficacy is less than 1 hour.

I conclude that heparin is effective in preventing death from pulmonary embolism in about 1 hour after injection.

Prospective study on the prevalence of deep vein thrombosis and incidental findings using ultrasound and D-dimer

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Background: This prospective study was designed to determine the incidence of deep vein thrombosis (DVT) and incidental findings (IF) in consecutive patients presenting with signs and symptoms of VTE.

Methods: Study population consisted of outpatients who presented with signs and symptoms of VTE. These patients were stratified into low, moderate, and high risk categories using modified Wells' criteria. All patients received D-dimer testing and lower extremity ultrasound. All veins from the external iliac to the ankle were examined. The type and location of IFs were recorded.

Results: A total of 200 patients [400 limbs] were included. There were 79 patients (39.5%) with low clinical pretest probability (PTP), 84 patients (42%) with moderate and 37 patients (18.5%) with high. DVT was found in 28 patients [incidence 14%], 22 were unilateral and 6 bilateral. Proximal DVT was found in 12 limbs, calf DVT in 14 limbs, and both proximal and distal in 5 limbs. IFs without DVT were detected in 42 limbs while both IF and DVT were seen in 3 patients. NPV of D-dimer was 99.5% in the low PTP group, 96.6% in the moderate and 85.7% in the high. IFs explained the signs and symptoms in 80% of those with an IF and altered management in 5 patients.

Conclusions: Even in well selected patients, the incidence of DVT is low. IFs may change the management in a small number of patients and could explain the clinical presentation in a significant proportion. The majority of patients have neither DVT nor IF.

Recurrent DVT

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Background: To estimate the cumulative incidence of recurrent venous thromboembolic events after a first or second DVT and to identify possible risk factors.

Methods: Retrospective analysis of 800 patients over last 3 decades was performed. Objectively symptomatic DVT was verified clinically and with Ultrasonography. Prior to availability of CDT patient were either treated surgically or with unfractionated Heparin. Since 2001 the change in treatment modality with CDT and newer systemic and oral anticoaugulants has brought up positive outcomes as and when compared to earlier methods.

Results: Over last 3 decades and transition from surgery to CDT our observations in 800 cases from single center have shown 10% recurrence after complete evacuation, apx. 15% PTS in cases of CDT clearance and additional medical management. Proximal DVT (relative risk [RR], 2.40; 95% CI, 1.48-3.88; P<.001), cancer (RR, 1.97; 95% CI, 1.20-3.23; P<.001), and history of a venous thromboembolism (RR, 1.71; 95% CI, 1.162.52; P<.01) predicted an independently increased risk of recurrent events in multivariate survival analysis. Postoperative DVT (RR, 0.27; 95% CI, 0.13-0.55; P<.001) and a long duration of oral anticoagulation therapy (RR, 0.95; 95% CI, 0.92-0.98; P<.01) involved a smaller risk of recurrent events.

Conclusions: Intimal endothelin-1, platelets aggregation, infection and inflammatory concepts have changed the recent thinking. The recurrence rate after a symptomatic DVT is high. Patients with proximal DVT, diagnosed cancer, oral anticoagulation therapy, or a history of thromboembolic events had a higher risk of recurrent events, while patients with postoperative or postpartum DVT had a lower recurrence rate.

Clinical scores in deep vein thrombosis: strengths and limitations

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Background: The diagnosis of deep vein thrombosis (DVT) remains challenging. Various clinical prediction rules have been developed in order to improve diagnosis and decision-making in relation to DVT. The aim of this review is to summarise the available clinical prediction scores and describe their applicability and limitations.

Methods: A systematic search of PubMed, MEDLINE and EMBASE databases was conducted, in accordance with PRISMA guidelines, using the keywords: 'clinical score', 'clinical prediction rule', 'risk assessment', 'clinical probability', 'pretest probability' and, 'diagnostic score' and Medical Subject Heading terms: 'Venous Thromboembolism/diagnosis' and 'Venous Thrombosis/diagnosis'. Both development and validation studies were eligible for inclusion.

Results: The search returned a total of 2036 articles, of which 102 articles met a priori criteria for inclusion. Eight different diagnostic scores were identified. The development of these scores differs in respect of the populations included (hospital inpatients, hospital outpatients or primary care patients), the exclusion criteria, the inclusion of distal deep vein thrombosis and the use of D-dimer. The reliability and applicability of the scores in the context of specific subgroups (inpatients, cancer patients, elderly patients and those with recurrent deep vein thrombosis) remains controversial and is discussed.
Conclusions: Detailed knowledge of the development of the various clinical prediction scores for DVT is essential in understanding the power, generalisability and limitations of these clinical tools.

Trends in mortality from venous thromboembolism in Europe, North America and Australasia: 1990-2013

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Background: Venous thrombo-embolism (VTE) is an important cause of preventable death. We aimed to describe VTE mortality trends in Europe, North America and Australasia 1990 to 2013.
Methods: VTE-mortality was defined as the underlying cause of death being PE or DVT as per the International Classification of Disease (ICD) v9 and v10. Sex-specific and country-specific VTE mortality rates were extracted from the WHO Mortality Database. Age standardized death rates (ASDR) were computed using World Standard Population. Joinpoint analysis was used to identify ASDR trend changes.
Results: Overall trend for reduction in VTE mortality is observed 1990 to 2013. VTE mortality rates were higher in Europe, compared with North America and Australasia. In 2013, most countries had VTE ASDR <5/100,000/annum; Bulgaria is an outlier with an increase in VTE ASDR from 0.9/100,000 to 14.0/100,000 for males, and 0.4/100,000 to 8.9/100,000 for females. VTE ASDR increases were also observed amongst males in Latvia (1.7-fold), males (7.8-fold) and females in Lithuania (2.5-fold). Hungary saw the greatest reduction in VTE ASDR, by 89% for males and 90% for males. VTE mortality rates were similar between sexes in the majority of countries. In Bulgaria, Czech Republic, Germany, Hungary, Poland and Romania there was a consistently higher ASDR for men compared to women.
Conclusions: VTE mortality is reducing. VTE mortality reductions seen in Australasia, North American and Western Europe have not been seen in a number of Eastern European countries. Further efforts are required to understand and address higher and increasing VTE mortality rates, and gender differences in certain European countries.

Annual prevalence of mortality and early re-hospitalizations of venous thrombo-embolic diseases in all French public and private hospitals

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Background: To evaluate the annual prevalence of mortality and early hospital re-admissions (before 3 months) of venous thromboembolic diseases (VTE), deep vein thrombosis (DVT) and pulmonary embolism (PE) in all French public and private hospital
Methods: The statistics are issued from the national databases transmitted and validated by all private and public hospitals (OLS). Hospital stays were studied over the period from April 2010 to September 2011 so as to have (1) a three-month (90-day) hindsight before the start of the study period (July 2010) in order to avoid to consider early re-hospitalization as an initial stay and (2) a follow-up of 3 months after the end of the study period (June 2011) in order to be able to detect possible re-admissions of VTEs occurring during the last quarter of follow-up.
Results: The results cover 170 764 hospital stays for PE or DVT in France from July 2010 to June 2011. The mortality rate during the initial stay is 6.92% for all the VTE, 4.69% for DVT without PE and 9.11% for PEs with or without DVT. The early re-hospitalizations rate is 7,94% for all the VTE, 7,92% for DVT without PE and 7,96% for PEs with or without DVT
Conclusions: This high prevalence of early re-hospitalization of VTE is questioning the effectiveness the medical follow-up that they have in ambulatory care after hospitalizations and the necessity to implement actions to better educate the patient and to raise the awareness of the general practitioners due to an increasing lack of angiologists.

The issues of recruiting to a multicenter trial in venous thromboembolism (VTE) prevention

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Background: UK venous thromboembolism (VTE) prevention recommendations state that patients at medium or high risk for VTE, should receive both pharmacological and mechanical thromboprophylaxis in the form of graduated compression stockings (GCS). The evidence base upon which these recommendations were made is weak and has been contested. A trial has been designed to clarify this issue.
Methods: Adult elective surgical patients identified as being at moderate and high risk for VTE will be randomized to receive either low dose LMWH with GCS, or low dose LMWH alone. Follow-up will be performed at 1 week post-surgery or at discharge, and at 90 days. Routine bilateral full lower limb duplex ultrasonography will be performed between 14-21 days post-operatively to capture peak VTE incidence. To show non-inferiority (3.5% non-inferiority margin) for the primary endpoint of all VTE within 90 days, 2236 patients are required.
Results: The primary endpoint is VTE within 90 days; a composite endpoint including duplex ultrasound-proven new lower-limb DVT (symptomatic *or* asymptomatic) *plus* symptomatic PE (imaging confirmed) up to 90 days post-surgery. To date 3796 patients have been screened and 749 patients have been randomized, a 20% inclusion rate (40% men; 60% women, mean age 56).
Conclusions: This study will be the first large randomized multicenter trial to compare VTE outcomes in surgical patients assessed as being at moderate or high risk and will support future policy in VTE prevention worldwide.

Correlation of various platelet indices in deep venous thrombosis

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Background: To assess the various platelet parameters in proved cases of Deep venous Thrombosis.
Methods: A total of 33 cases and 33 controls were included in this study. All patients who had proved DVT on Compression Doppler study were

included. Patients already on anti platelet drugs or anticoagulants were excluded. Samples taken were the blood and Beckmann Coulter analyzer was used to study the various platelet indices. D Dimer was also assessed.
Results: On comparison of various platelet indices and other parameters, total leucocyte count, RDW, Mean Platelet volume, PDW and P-LCR were found to be raised in patients as compared to controls. Correlation study reealed that MPV is directly related to PLCR and inversly related to Platelet Count. Platelet Count is directly related to PCT and PLCC.
Comparison of all platelet indices between case and control showed that RDW, MPV, PDW and P-LCR were significantly raised in cases (RDW: 57.8±15.2fL *vs*. 43.2±5.5fL with P<0.001, MPV: 9.9±1.2fL *vs*. 9.1±0.9fL with P=0.004, PDW: 16.5±0.7fL *vs*. 15.9±0.6fL with P<0.001, P-LCR: 40.9±8.2% *vs*. 34.2±8.0% with P=0.001).
ROC analysis of MPV showed AUC=0.664, P=0.022, cut-off value=9.25, sensitivity=60% and specificity=58%. Comparison of all platelet indices with MPV<9.25fL and MPV>9.25fL showed that platelet count is raised in patients with MPV<9.25fL (309.6±79.1x10^{-3}/μL *vs*. 226.6±107.7x10^{-3}/μL; P=0.023). All other indices showed insignificant relation with both groups.
Conclusions: Combination of various platelet indices with D Dimer can increase detection sensitivity of DVT even in absence of Duplex Scan and can be used as screening method to detect DVT.

The incidence of pulmonary embolism in patients with combined ilio-femoral venous thrombosis and iliac vein stenosis

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Background: The purpose of this study is to assess the hypothesis that iliac vein stenosis may protect against embolization of a large deep venous thrombosis (DVT) to the lungs, decreasing the incidence of a symptomatic pulmonary embolism.
Methods: Between June 2015 and July 2017, patients with symptomatic extensive ilio-femoral DVT were treated with percutaneous thrombectomy by the AngioJet system. Patients presenting with symptoms suggestive of Pulmonary embolism underwent a CPTA or VQ scan. The associations between thrombus location, stenosis, and pulmonary embolism were assessed using a stratified analysis.
Results: A total of 42 patients were treated and 100% were found to have an iliac vein stenosis >50% on venogram, with 32 (76.2%) demonstrating a stenosis >75%. 13 patients (30%) also had symptomatic pulmonary embolism, confirmed by CTPA or VQ scan. Of these 13 subjects, all had an iliac vein stenosis of >75%.
Conclusions: Iliac vein stenosis is highly prevalent in extensive iliofemoral DVT. Patients with a stenosis >75% are not protected from developing pulmonary embolism.

Incidence of residual deep incompetence post successful angiojet thrombectomy of extensive ilio-femoral DVT

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Background: The purpose of this study was to assess the hypothesis that early thrombus removal in extensive iliofemoral DVT would preserve deep venous function.
Methods: Between June 2015 and July 2017, patients with symptomatic extensive ilio-femoral DVT were treated with percutaneous thrombectomy by the AngioJet system. Presence and grading of iliac vein stenosis as well as evidence of previous thrombosis, with scarring of the femoropopliteal segment, was documented at the time of the intervention.
Patients were followed-up by clinical examination and limb circumference was used to objectively document reduction in oedema. Serial duplex ultrasound was used to assess patency of treated vessels and residual incompetence of the femoro-popliteal segment. Technical success was defined as restoration of flow in the affected area by 4 weeks post intervention.
Results: Technical success was achieved in 98% of patients. Of these, 62% had intraoperative evidence of previous lower limb DVT with scarring evident. On immediate follow-up, all the patients treated reported improvement in the symptoms and objective reduction in the oedema was documented within 48 hours. Patency of the ilio-femoral segment correlated well with the absence of post thrombotic syndrome while ultrasound in the cohort with no signs of previous DVT showed preservation of valvular function in the femoro-popliteal segment.
Conclusions: In patients presenting with extensive ilio-femoral DVT it is common to find not only iliac vein stenosis but also femoro-popliteal vein stenosis suggestive of previous sub-clinical DVTs. Early thrombus removal appears to be effective at preventing post-thrombotic syndrome and preserving valvular function.

The treatment of upper extremity deep vein thrombosis and its risk factors

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Background: Through the upper limbs of deep vein thrombosis in our hospital patients were retrospectively analyzed, analysis the reasons of upper extremity deep vein thrombosis, to explore the clinical performance of upper limb deep vein thrombosis, and the treatment, in order to implent clinical intervention, effectively reduce the PICC related incidence of thrombosis.
Methods: We selected 126 cases of patients with upper limbs of deep vein thrombosis occurred in our hospital from May 2014 to June 2015, who met the inclusion criteria were included in the object of study, discussed the reasons of upper extremity deep vein thrombosis, risk factors, clinical manifestations and the scope of prognosis.Statistical analysis of group comparison of incidence between the x2 test, the related risk factors of single factor and multi-factor logistic regression analyzed. Results there were 117 cases of patients with malignant tumor, 117 cases of patients with history of PICC catheter, 88 patients there is swelling, pain symptoms, 76 cases of patients, 12 patients complicated with lower limb deep vein thrombosis, pure involving the subclavian vein, axillary vein, internal jugular vein was 12, 11, and 26 cases, involving multiple root vein of 77 cases, including 9 cases of patients with CTA diagnosis of pulmonary embolism, 5 cases died, formal anticoagulant treatment, 114 patients were significantly improved.
Conclusions: PICC related of upper extremity deep vein thrombosis incidence is higher, and some patients without obvious clinical manifestations, we need attention.Regular anticoagulation is first choice for the treatment of upper limb deep vein.

VASCULAR ANOMALIES

Congenital vascular malformations: from diagnostic to treatment

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Background: Congenital vascular malformations (CVM) occur in 1,5-10% of the total population. Various manifestations of CVM cause difficulties in diagnosis and treatment, resulting in disability and sometimes, death of the patient.
Methods: The data of 630 patients with CVM (period 2005-2016) were analysed, females predominated (55%), average age was 25.5. Ultrasound duplex scanning, selective arteriography, phlebography, multidetected computed tomography, pathomorphological and immunohistochemical studies (proliferation markers VEGF, Ki67), study of the hemostasis (D-dimer, soluble fibrin, fibrinogen) and fibrinolytic system (protein C) were investigated.
Results: The source of proliferation of both forms of CVM (venous and arteriovenous (AV)), given the level of VEGF and Ki67 expression, is precisely the microcirculatory vasculature, due to the presence of existing AV microfistulas.
It was discovered significant imbalanse of hemostasis system in preoperative period in 9 (43%) patients with AV CVM (significant activation of coagulation capacity with normal activity of fibrinolytic system), in postoperative period hypocoagulation was observed at 4 (57%) of patients.
Treatment strategy:
1. Endovascular methods (embolization with the use of non-spherical PVA particles) during preoperative stage and combination of surgical, embolization, laser and sclerotic methods in perioperative stage;
2. Correction of AV shunting separately or in conjunction with venouse hypertension correction;
3. Correction of secondary venous hypertension in superficial and/or deep venous systems.
4. Correction of lymphatic outflow (lymphodrenation, lymphangioplasty, and lipolymphoaspiration, lymphovenous anastomoses).
5. In cases of severe pain syndrome neurolysis with fascicullary dissection were performed.
Conclusions: This pathogenically based approach allowed to obtain satisfactory long-term results in 76% of patients.

Pelvic venous malformations

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Background: Location of venous malformations in the pelvic area may be difficult to recognize and to treat. For this reason, patients are often not treated. Aim of this paper is to do a retrospective analysis of a group of patients affected by pelvic venous malformations that come to our Center for treatment in order to recognize if treatment is possible and whith which results.
Methods: A group of 624 patient affected of venous malformations, collected and treated by our Center between 2011 and 2015 were analyzed in a retrospective study. 35 patients (6,2%) had a venous pelvic malformation. Location of malformations were: female genitals: 16 (46%), gluteus: 8 (23%), male genitals: 2 (6%), intrapelvic: 5 (14%), psoas muscle: 4(11%). 15 cases (43%) had also VM in other locations. Examinations performed were: Duplex scan (35): MR (33) CT (2) RX (8). Treatments were: percutaneous alcohol treatment: 51, laser 16, surgery,1. Patients were evaluated at the end of treatment clinically, by duplex scan and, if deep located defecs, by MR. Healed patients were those with a complete occlusion of the abnormal veins, improved patient had a partial occlusion and no o slight symptoms, unchanged cases had no changement in dysplastic vessels
Results: 15 cases were defined "healed"; 8 of this were genital VM. 12 cases has a significant improvement with main reduction of symptoms. 1 case remain unchanged. 7 patints were not treated because of slight symptoms or because they refuse treatment. 2 patiens had a small skin necrosis on gluteus, which healed without problems. No other complications were noticed
Conclusions: Pelvic venous malformations can be treated with good results. Main techniques used are alcohol sclerosis and laser. These thechniques should be well known before performig them

Surgical tips for hand arteriovenous malformations

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Congenital arteriovenous malformations (AVMs) are a primitive type of congenital vascular malformation that forms as the residual remnants of a developmental arrest in the early stage of embryonic life. AVMs of the hand display various clinical presentations, including heaviness, a pulsating mass, a sensation of heat, pain, bleeding, ulceration and necrosis. Furthermore, hand AVMs are likely to cause cosmetic complications and functional impairment or fracture. A large shunt can create hemodynamic alterations leading to cardiopulmonary overload and congestive heart failure.
The lesions may or may not become clinically evident from birth to adulthood. Trauma, surgery and hormonal influences may cause the lesion to expand hemodynamically.
Hand AVMs are unusual and when they are present, they are difficult to treat because of the necessity to maintain function and there is a high complication rate after treatment. The treatments of ATMs of the hand include conservative treatment, embolo/sclerotherapy, partial excision and amputation; however, there is currently no consensus for the treatment of ATMs of the hand.
We will present the surgical tips for hand AVMs during the Congress.

How to manage the soft tissue injury caused by embolo-sclerotherapy

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Despite the advances in vascular medicine, congenital vascular malformations (CVMs) are still a challenge among the many vascular diseases. Complete eradication of the nidus of a CVM has been known to be the therapeutic option for achieving a potential cure. Yet, complete surgical eradication of the nidus of a CVM is rarely possible for most of the infiltrating type of CVMs, except for the small, localized and surgically accessible lesion. Blocking the route for embolo/sclerotherapy by ligation of the feeding arteries and partial excision of the nidus might interfere with embolo/sclerotherapy, and the outcome is then worsened.

Once the accurate diagnosis of the CVM is established, further decisions should be referred to the multidisciplinary team of the CVM. The multidisciplinary team might be made up of special departments related to the management of CVM: vascular surgery, plastic and reconstructive surgery, orthopedic surgery, interventional and diagnostic radiology, physical medicine and rehabilitation etc. Embolo/sclerotherapy may be an effective treatment method because no recurrence has been observed during the relative long-term observation period and the morbidity was acceptable. Yet, it is not well known what type of vascular malformation is more susceptible to complication such as soft tissue injury or neuropathy after performing embolo/sclerotherapy.
We will present how to manage the soft tissue injury caused by embolosclerotherapy during the Congress.

Management of complicated venous malformations

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Background: Venous malformations may manifest in different locations and extension. Complicated or complex forms are cases with a diffuse, infiltrating form, cases located in areas with fine structures were a treatment may be difficult or cases with a combination of VM and other type of defect, like lymphatic or A-V malformations. Location of complrx cases are in different parts of the body with different approach prolems.
Methods: Some particular complex cases located on head, neck, limbs, hand, abdomen and foot are presented. Problems of diagnostic and of tretment possivilities are discussed
Results: By a complete diagnostic and the correct treatment technique, even these complex cases can be managed. To operate together with other specialists often makes the difference.
Conclusions: Even complex venous malfomations can be treated, if correctly approached. Multidisciplinary approach is often required. These cases are not for a single operator.

Vein valve defects and insufficiency in children

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Background: Venous insufficiency of the lower extremities is regarded to be a genetically determined, acquired disease. Children have rarely been examined. In earlier studies, the incidence is commonly estimated to below 1%.
Methods: In an ongoing study, the legs of 36 young relatives of vein patients, aged 6 – 16 (18 m, 22 f) were examined with high frequency ultrasound (X 700, 12-16 MHz; Vevo MD, 16 – 40 MHz).
Results: In 13/36 children (36.1%) venous pathology was found: Valvular defects of the GSV with reflux (N.=4) or without macroscopic reflux (N.=4), reflux of GSV without detectable valve defect (N.=2), valvular lesion of SSV (N.=1), perforator insufficiency without valve detection (N.=2). All cases were unilateral. 6/13 cases with pathology (46.1%) showed changes of regional superficial veins (diameter increase, more intense colour).
Conclusions: The incidence of detected valve lesions in children was above all expectations, even if taking a bias by case selection into account. Supposed that the acquisition of valvular insufficiency by hypertensive wall stress/dilatation or stasis/inflammation takes decades, the shown pathologies should be best explained by congenital valve defects. New strategies for systematic detection, coaching and adequate therapy have now to be developed.

Vascular anomalies in the mesenteric circulation of patients with Crohn'S disease. A pilot study

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Background: Crohn's Disease (CD) is a chronic inflammatory bowel disease and its pathogenesis is still not well understood. Previous studies suggested the possibility of the involvement of vascular system, but, todate, the mesenteric circulation has poor been investigated, especially in complicated CD cases requiring colectomy.
Methods: We investigated the mesenteric circulation in a case-control pilot study, including 19 controls and 7 patients affected by complicated cases of CD. Cases and controls underwent selective angiography of both superior and inferior mesenteric district.
Results: Transit time was found either significantly shortened in 2/7 cases (29%), or prolonged 5/7 (71%) (P=0.0034 in the superior mesenteric district; P=0.0079 in the inferior mesenteric district), respectively due to the presence of A-V malformations and of a miscellaneous of venous abnormalities, which included thrombosis, hypoplasia and extra-truncular venous malformations.
Conclusions: Our study demonstrates the presence of congenital or acquired vascular anomalies in a small sample of CD patients not responder to current treatment and with severe complications. The present pilot study warrants further investigations.

A study of angiotensin II level and treatment by intralesional bleomycin in hemangiomas

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Background: Hemangiomas are the most common tumors in infancy especially in Head and Neck region. The incidence of Hemangiomas in the first 3 days of life is 1% to 2.5% and increases to 9% to 12.5% between the ages of 1 month and 1 year of life. Our study is aimed at studying the effect of intralesional Bleomycin to assess its response. Also We studied the role of Renin-Angiotensin-system in the biology of infantile Hemangiomas demonstrated by the expression of Angiotensin II.
Methods: A detailed proforma was made. For estimation of serum angiotensin II-Angiotensin II Human ELISA kit was used in serum of patient and result was compared from Standard curve.
After confirmation by Doppler study, Intralesional Bleomycin Sclerotherapy was carried out so to uniformly distribute it in the lesion area and the response was assessed.
Results: Fifty patients with peripheral hemangiomas were studied. Nearly all patients of Hemangiomas who underwent sclerotherapy responded to treatment and response of therapy was assessed clinically and on basis of USG color Doppler according to the WeidongShou standards as cured, basically cured, improved and ineffective. Results were as follows: 42 (84%) cured, 6 (12%) basically cured, 2 (4%) improved. Serum Angiotensin II level was estimated in 50 patients of Hemangiomas and 32 age matched controls were taken for the comparison. Mean values of serum Angiotensin II level in Hemangiomas was 585.92±314.69379 pg/ml and the range was 107.24 to 999.25 pg/ml. Controls had serum Angiotensin II level mean 22.4363±7.20596 pg/ml and range was 12 to 39.09 pg/ml. The values were highly significant than the controls (P-value<0.05).
Conclusions: 50 patients with Hemangiomas underwent sclerotherapy by intralesional Bleomycin with a response rate of 84%. Serum Angiotensin II values in serum of Hemangiomas was found significantly higher than controls.

Characteristics and clinical presentation of venous malformation of extremities

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Background: The presentation of venous malformations (VM) is variable but it has not been well documented. This study was designed to determine the clinical characteristics in association with the type and extent of VM.
Methods: Patients with VM diagnosed by physical examination and confirmed by ultrasound, CT or MRI were included in the study. Data were collected from three University hospitals from 2009 to 2017. Demographics of the patients, type, extent and tissue involvement of VM, signs and symptoms were reviewed. The severity of the symptoms and the impact on the patients' quality of life was recorded. Those with arteriovenous malformations, lymphedema and symptoms from other unrelated diseases were excluded.
Results: There were 55 patients with a mean age of 33.6 years (19 males/36 females). Klippel -Trenaunay syndrome was diagnosed in 3 patients. Lower extremities were more frequently involved (N.=39, 70.9%) than upper extremities (N.=16, 29.1%). Most lesions were localized (N.=38, 69.1%). VM extended into the subfascial space in 32 (58.1%). Accompanying signs and symptoms were venous enlargement (N.=32, 58.2%), pain (N.=39, 70.9%), and swelling of the extremities (N.=37, 67.3%). Patients with VM distributed on their leg showed symptoms of venous insufficiency, including aggravating pain while walking (N.=32, 82.1%), swelling worsening with prolonged standing (N.=27, 69.2%), fatigue or heaviness of lower extremities (N.=12, 30.8%), discoloration (N.=7, 18.4%) or ulcer (N.=2, 5.6%). These symptoms were related to the extent of the lesion (odds ratio=4.84; 95% confidence interval, 2.335-7.346; P<0.001), but not to the involved depth (P>0.05). The treatment method was mainly decided by the extent and the depth of lesions. Excision was performed in 13 (23.6%) patients, sclerotherapy in 15 (27.0%), embolization in 2(3.6%), endovenous laser ablation in 1(1.8%) and stripping in 2(3.6%).
Conclusions: VM of the extremities affected patients' quality of life significantly by their appearance and pain. There was significance association with the VM extent and symptoms severity. Significant satisfaction was achieved when treated localized malformation where in the extensive ones symptoms intensity was reduced.

Sclerotherapy and venous malformations: a South Australian perspective over the decade

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Background: Vascular malformations are a vast group of congenital malformations that can cause significant symptoms to children. Although a range of treatment options exist, they can be particularly challenging to treat effectively. Sclerotherapy has become an important tool in the treatment of vascular malformations, however, little is known about the overall success and patient satisfaction.
Methods: This study retrospectively evaluates the clinical outcomes of percutaneous sclerotherapy for venous malformations at the Women and Children's Hospital and Australian Craniofacial Unit over from 2007 – 2017. A multidisciplinary team approach driven by protocol was implemented during the assessment in conjunction with radiologists to formulate a plan of assessment and treatment.
Results: The clinical and radiological data from medical records were analyzed to obtain information about venous malformations. The data evaluated the results of sclerotherapy, types and rates of complications, outcome relations with age, size and number of sessions.
Conclusions: The review highlights that sclerotherapy is a safe method for local malformations, but there are moderate risks that need to be taken into consideration for all cases to delineate which patients will gain most benefit. A multidisciplinary approach from the unit provides a holistic assessment of the patient and long term follow-up over the years as they grow.

Development of knowledge on vascular anomalies through history. Main contributors in the last decades.

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Background: Complexity and variability in CVM made it difficult to understand CVM. Beside popular believe, like the "maternal impression" (influence of maternal emotions during pregnancy) and others, in the past centuries, descriptions of different clinical cases with difficulty to understand the disease, due to a lack of disgnostic instuments, were common. Interest were mainly focused on clinical cases that probably were AVM malformations. Well know is the description of an AVM of the scalp by the Florentine doctor Guido Guidi in the XVI century. Between others, the French dermatologist Jean Louis Alibert described different types of vascular anomalies trying to classify them. Rudolph Wirchov proposed a classification that was a main progress in knowledge and in the process of clarity arounf CVM. The well know paper of Klippel and Trenaunay in 1900 and the papers of Federick Parkes Weber (1907 – 1918) were considered a milestone in the development of knowledge, even if later these papers create also confusion. De Takats in 1934 proposed a distinction between AVM and other anomalies. A main contribution was those of Mulliken and Young in 1988 who made clear the difference between hemangiomas and vascular malformations.
Methods: Treatment of AVM was discouraged after the paper of Szilagyi in 1976. However, the publications of Malan (1974) and that of Belov (1986), based on personal experience on large series, demonstrated the feasibility of surgical approach, even if failures were possible. Improvement in endovascular techniques and the introduction of alcohol embolization by Yakes in 1986 marked another main progress in treatment
Results: Recent discover of the efficacy of Propanolol in the treatment of hemangiomas by Léauté-Labrèze (2008) changed significantly the approach to that common anomaly
Conclusions: Knowledg about vascular anomalies is on the way.

Vascular anomalies, modified hamburg classification: truncal diseases

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Background: Hamburg Classification has been proposed by Stefan Belov in 1988, during the Vascular Malformation Workshop on Hamburg 1988. It is based on the classification of Malan (1965), which has been the most accepted classification at that time, with some main modifications. His main advantage is simplicity, as it include all defects in few groups in a period in which very complicated classifications were proposed.
The group of truncal (or truncular) defects includes all anomalies of main vessels: arteries, veins and lymphatics. The defects are divided in hypoplasia, aplasia and dilatation. This simplicity is very effective for diagnosis, as it is a good guide for progression of examination.
Conclusions: In this lecture, different types of truncal vascular arteria, venous and lymphatic in different parts of the body were presented and discussed. Clinical pictures related to the single defet were shown.

POST-THROMBOTIC SYNDROME

Clinical efficacy of electrical calf muscle stimulation in patients with residual venous obstruction and post-thrombotic syndrome

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Background: To assess the efficacy of electrical calf muscle stimulation (EMS) in patients with post-thrombotic syndrome (PTS) and residual venous obstruction (RVO).
Methods: This was a prospective, comparative, nonrandomized clinical trial involving patient after the first episode of unprovoked popliteal-femoral DVT who had completed a standard 6-month course of anticoagulation therapy and had signs of RVO in the affected veins and a Villalta score of >5.
A total of 60 patients in the age range from 40 to 86 years (mean 58.5±11.4) consisting of 38 men and 22 women were enrolled. They were divided into two groups of 30 participants each. In both groups (treatment and control), PTS was treated by active walking, below-knee graduated compression stockings, and micronized purified flavonoid fraction. In the treatment group, EMS with «Veinoplus VI» device (three procedures for 30 min every day) was also used. The criteria for treatment efficacy included changes in Villalta, VCSS and CIVIQ-20 scores, assessed at baseline and every 6 months of treatment. The patients were followed for 12 months with monthly DUS in order to reveal recurrent DVT.
Results: Recurrence of venous thrombosis was found in seven of 30 patients in the control group and in zero of 30 patients in the treatment group (P=0.011). All these cases were excluded from subsequent analysis. Patients of the treatment group had a significant tendency to decrease the VCSS score: 9,9±1,6 – 7,8±1,6 – 6,1±1,5 (P<0,0001); Villalta score: 18,9±3,9 – 12,8±4,0 – 8,3±2,7 (P<0,0001); CIVIQ-20 score: 67,8±8,4 – 51,3±8,4 – 40,0±10,5 (P<0,001). In the control group, a similar trend was observed for the VCSS score: 8,1±2,8 – 7,3±2,1 – 7,2±2,1 (P=0,014); for Villalta score: 12,7±6,7 – 10,9±5,6 – 10,2±5,4 (P=0,002), but not for the CIVIQ-20 score: 48,2±19,3 – 46,7±17,3 – 47,4±16,2 (P>0,05). At the background of EMS, changes in the current parameters were more intensive (P<0,05).
Conclusions: using EMS technology in the complex treatment of PTS allows reducing clinical severity of disease and increasing the quality of life in patients with RVO.

Endovascular treatment of PTS

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Background: To determine the effects of Endovascular treatment of postthrombotic syndrome (PTS).
Methods: The clinical data of 32 patients with PTS and treated with endovascular therapy were retrospectively analyzed. The age of these patients ranges 34~72 (mean 58±12), History of DVT was 3-24 months. Villalta's scores were all ≥15. These patients were divided into 3 groups.
Results: The endovascular treatments were successful in these patients. All the iliac lesions were treated with stenting while the femoral/superficial femoral lesions were treated with balloon angioplasty. The postoperative recoveries were uneventful. Warfarin was taken postoperatively as long-term anticoagulant. Elastic stockings and auxiliary medicine were used for quick recovery. Follow-up time was 3-28months, all the patients had their symptoms and signs relieved or cured including 2 patients in group II with intractable ulcers healed.
Conclusions: Endovascular treatment for PTS was safe and effective with quick and smooth recovery. Balloon angioplasty is also valuable for severe venous lesions in the limb.

Correlation of clinical and ultrasound parameters used to assess the severity of post-thrombotic syndrome in patients after popliteal-femoral DVT

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Background: to evaluate the correlation between VCSS, Villalta, VSDS, CIVIQ-20 and the modified Marder scores in patients with post-thrombotic syndrome (PTS) and signs of residual venous obstruction (RVO) of the popliteal-femoral veins.
Methods: It is correlation analysis of the data generated from a clinical trial aimed to assess the effectiveness of electrical calf muscle stimulation in the complex treatment of PTS in the presence of RVO. The study enrolled patients after the first episode of clinically unprovoked proximal DVT who had completed the standard course of anticoagulation and presented a clinical picture of PTS (5 or more Villalta scores) and signs of RVO of the popliteal-femoral venous segment with a residual stenosis of 20% or more. All patients were examined clinically and by duplex ultrasound at the time of enrollment, and after 6 and 12 months of therapy. The evaluation was performed by the Villalta, VCSS, VSDS scores, CIVIQ-20 questionnaire, and the modified form of Marder VJ.
Results: A total of 60 patients were included into the study, of which recurrent DVT was observed in 7 cases. So, 55 patients entered the analysis at the 6th month and 53 patients at the 12th month, as well as data of 53 patients, were used for the analysis of dynamic changes. During the 12-month follow-up, there was a direct, significant correlation of moderate to high strength between scores of VCSS, Villalta, and CIVIQ-20. The correlation between the severity of hemodynamic changes (VSDS and Marder scores) and the clinical severity of PTS (VCSS, Villalta and CIVIQ-20 scores) was variable and characterized by low and moderate strength. The dynamic changes in the mean values of VCSS, Villalta, CIVIQ-20 and Marder scores were characterized by a strong and significant correlation. Dynamic changes in the mean values of VSDS score did not correlate with other parameters.
Conclusions: The investigated petameters show a good correlation with each other at the moment and in the time period. They all should be used for complete assessment of clinical severity and hemodynamic disturbance in PTS.

Postthrombotic syndrome is reduced by lipid lowering therapy

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Background: The most frequent complication of proximal deep vein thrombosis (DVT) is post-thrombotic syndrome. Recently, we showed inhibition of varicose vein development by atorvastatin and rosuvastatin. In this study, we tested the influence of lipid lowering therapy (LLT) with statins on postthrombotic syndrome (PTS) development.
Methods: Between 01/2002 and 03/2017 30.186 patients were treated for venous disease in our institution, 551 (1.8%) with DVT. The Villata scoring system was used for the assessment of the severity of PTS. 421/551 (76%) patients developed PTS. 61/551 (11%) received lipid lowering therapy. All patients were treated conservatively with compression stockings and all patients received therapeutic anticoagulation, except 2 patients, who refused therapy. Patients received clinical exam with duplex sonography after 2 weeks, 3 months, 6 months and annually thereafter. 192/551 (35%) had recurrent DVT and received life-long therapeutic anticoagulation.
Results: 381/487 (78%) patients without LLT presented with PTS and 40/61 (65%) patients with LLT (P=0.027). Severe PTS (Villata score mean 16.8) appeared in 12/381 (3%) non-LLT patients but not in LLT group. In our study, the risk of recurrent DVT was not lowered by LLT. Low number of LLT treatment might be explained due to higher incidence of DVT in patients aged <35 since 2011 in our collective (77/310, 25%)
Conclusions: Postthrombotic changes and severe postthrombotic syndrom might be reduced by lipid lowering therapy.

Combined use of micronized purified flavonoid fraction with oral rivaroxaban reduce the incidence of post-thrombotic syndrome at six month after proximal deep vein thrombosis

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Background: to assess the impact of long-term using of micronized purified flavonoid fraction (MPFF) in the treatment of proximal deep vein thrombosis (DVT).
Methods: this was a pilot randomized open-label study enrolled patients with the first episode of popliteal-femoral DVT confirmed by duplex ultrasound. All participants were randomized into two groups: control, that received a standard treatment with oral rivaroxaban and graduated compression stockings (20-40 mm Hg), and experimental, that required additional treatment with MPFF 1000 mg per day. Both drugs and stockings were used for 6 months. Patients were followed-up for the whole period of treatment. At the end of follow-up, patients were assessed with Villalta score and VCSS score. Post-thrombotic syndrome (PTS) was diagnosed in those, who had 5 and more Villalta scores.
Results: 40 patients were randomized into the control (N.=18) and experimental (N.=22) groups: 27 men and 13 women, mean age of 57,1±14,3 years. The median of Villalta score in the group treated additionally with MPFF was significantly lower compared to the control one: 2,0 *versus* 6,0 (P<0,0001). The same difference was found for VCSS score: 2,0 *versus* 6,0 (P<0,001). According to Villalta score, PTS was diagnosed in 6 of 22 patients in the experimental group and in 13 of 18 patients in the control one (P=0,01). None of any patient had a severe PTS.
Conclusions: MPFF using can reduce the incidence of PTS diagnosed at 6 months in patients with proximal DVT treated with oral rivaroxaban.

Compression in Patients with Cardiac Failure

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Guidelines often recommend that compression is contraindicated in acute/uncontrolled heart failure. In elderly patients with chronic oedema, heart failure may be the sole cause or a contributory factor in the development of swelling. In patients with leg ulcers, the coexistence of heart failure also needs to be considered in the decision to use compression.
The clinical history and examination may indicate the presence of heart failure but further investigations such as plasma B-type Natriuretic Peptide (BNP) and echocardiography are helpful in determining the degree and type of heart failure.
The safety of the use of compression may be different in heart failure with reduced ejection fraction and that with preserved ejection fraction.
In patients where heart failure is the major cause of oedema, appropriate management of the heart failure *e.g.* with drugs should be the first step.
If residual chronic oedema remains a problem despite optimum drug management of the heart failure, then, particularly in those with leg ulcers or lymphorrhoea, compression may need to be considered.
In these circumstances modified (reduced) compression is often recommended with advice to discontinue the compression should breathlessness develop.
The use of serial BNP measurements may help in decision-making. A case series of these will be described.

FEBRUARY 8, 2018
THURSDAY

ENDOVENOUS INTERVENTIONS AND SURGERY

Patterns of sartorial vein plexus pathology and clinical outcomes of treatment

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Background: Reflux involving veins in the sartorial area has not been investigated. This study was designed to determine the patterns and extent of reflux and to assess clinical characteristics, treatment options, and outcomes in patients with sartorial venous plexus pathology.
Methods: Consecutive patients with reflux in the sartorial area were detected with duplex ultrasound. The patients' clinical characteristics, patterns and extent of reflux were recorded in detail. Treatment was performed with ligation, phlebectomies and foam sclerotherapy under duplex ultrasound guidance. Follow-up was performed with both clinical examination and ultrasound. Subsequent treatments were noted. All patients had a minimum 1 year follow-up.
Results: A total of 17 patients, median age 49 years, were included in the study. Of these, 52%, 35%, 12% were of CEAP clinical stages C2, C2/3, and C2/3/4, respectively. Previous vein treatments were reported in 18%. The extent of venous disease was greatest in the lower thigh at 71%. Of those, 41% had extensive reflux in the medial aspect of the thigh. The incidence of venous reflux after treatment was 41%, 33%, and 25% for residual, recurrent, and new occurrences, respectively. Overall, CEAP reclassification at follow-up demonstrated 82% with a CEAP stage of C0-1 after appropriate treatment.
Conclusions: Veins in the sartorial area can cause variable clinical presentation. Detection of such reflux is important as it can be misdiagnosed for saphenous reflux. Ultrasound-guided sclerotherapy and phlebectomies are effective options for treatment for these veins with good outcome at one year.

Thrombophilia in non-thrombotic chronic venous disease of the lower limb - a systematic review

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Background: Chronic venous disease (CVD) represents a significant healthcare burden, presenting with a spectrum of clinical signs including varicose veins and venous ulceration. Studies have proposed thrombophilia as a risk factor, particularly with respect to post-thrombotic CVD. Its relationship to non-thrombotic CVD has not been comprehensively reviewed.
Methods: PubMed and EMBASE databases were systematically searched from 1946 until March 2017. Case-control studies, cohort studies or randomized clinical trials reporting on the relationship of thrombophilia to non-thrombotic lower limb CVD in adult patients were included. Non-English and post-thrombotic syndrome studies were excluded. Study selection and data extraction were performed by two independent reviewers.
Results: 15 studies met the eligibility criteria, reporting on 916 cases and 1,261 controls. Studies largely focused on venous ulceration and investigated multiple haemostatic factors. A direct relationship between thrombophilia and non-thrombotic CVD was identified, with greater prevalence and factor concentration alteration reported in patients compared to controls. Presence of multiple concomitant thrombophilia was also associated with earlier CVD onset. Targeting hyperhomocysteinemia with folic acid and factor VIII, PAI-1 and von Willebrand factor with aspirin shows promise in enhancing CVD treatment. Relationship strength between each thrombophilia and CVD varied, with commoner aetiologies like factor V Leiden and elevated factor VIII showing clearer correlation than rarer ones such as antithrombin deficiency.
Conclusions: Thrombophilia is associated with non-thrombotic CVD but causation cannot be determined. Future research should focus on prospective studies with larger study populations to establish causation and then identify adjunct therapies targeting thrombophilia.

Our outcomes of ClariVein ablation in one day surgery clinic, Palas Athena

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Background: The authors of the retrospective study present four years outcomes with mechanochemical endovenous ablation (ClariVein). The ClariVein is a new minimally invasive method which combines machanical demage of endothelial cells and chemical injury with liquid sclerosant. The adventages of these method are reducing pain during and after treatment, as well as reducing heat- related injury.
M**ethods:** We present retrospective study in the period from January 2013 to January 2017. The inclusion criteria was reflux in great, small or accessory saphenous veins and patients who had vein diameters of 3 mm to 10 mm. In small part of patients we need to use sedation. Tributary veins were treated by concomitant or subsequent sclerotherapy. Initial technical success, complications, visual analogue scale and closure rate were assessed. Patients underwent duplex sonography 3. day, 3 month and 1 year after procedure.
Results: 124 patients underwent 138 ClariVein ablation in One Day Surgery Clinic from 2013 to 2017. We performed 124 procedures in great saphenous vein, 9 procedures in small saphenous vein, 5 procedures in accessory saphenous veins. The occlusion rate was after 3 days 100%, after 3 months 96% and after 1 year 92%. The visual analogue scale was between 1-2 (0-10). No paraesthesia was occurred in our patients. We noted no deep vein thrombosis and no pulmonary embolism.
C**onclusions:** The introduction of ClariVein system brings a tumescentless approach in venous surgery. The demage of venous wall during the proccedure is less invasive than in heating methods. The results of ClariVein ablation are very similer to thermal methods, about 90-95% of success rate after one year of follow-up. We confirm, that ClariVein system is the successful and safety procedure.

Multi-discipline based standard operating procedure to decrease phlebitis in surgery patients

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Background: Phlebitis after operation has been a significant problem in surgery clinical practice, as unavailable IV protocol between surgery

wards and operation rooms (ORs), resulting in phlebitis and additional cost.
Methods: A prospective study was performed in surgery patients in March, 2016 - May, 2017. Inclusion: 1. Aging 18-65; 2. IV occupation 12h before surgery; Exclusion: 1. Patients with a central venous catheter; 2. Sent to ICU; Patients with central venous catheter during operation were removed. No IV consensus in March, 2016 - September, 2016 (Traditional group) between wards and ORs. SOP was performed in October, 2016 - May, 2017 (SOP group). Patients followed SOP and conferences were held monthly to report issues. Patients' age, gender, preoperative score of activities of daily living (ADL), phlebitis, stage of phlebitis were collected. Continuous variables were expressed as x±s. T test was used whereas Chi-square, rank-sum test in categorical variables. Statistical significance was defined at $P<0.05$ (two-tailed). SPSS 17.0 was used.
Results: 942 patients were enrolled. 237 males, aging 53.67±8.85 and ADL 93.18±1.34 in traditional group, 241 males, aging 52.61±9.37 and ADL 93.22±1.58 in SOP group. No significant differences were found ($P<0.05$). 28.27% phlebitis, 22.90% stage I, 3.70% II, and 1.67% III phlebitis in traditional group, 11.69% phlebitis, 8.35% I, 2.30% II and 1.04% III phlebitis in SOP group. There was a significant difference in phlebitis and stage I phlebitis rate ($P<0.01$).
Conclusions: SOP significantly decreased phlebitis especially stage I phlebitis, contributing to IV management in surgery patients.

The radiofrequency ablation optimized mode for saphenous veins with a diameter up to 6mm

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Background: A widely used radiofrequency ablation (RFA) for insufficient saphenous veins treatment is accompanied by a high incidence of paresthesia. The temperature at which there is a risk of nerve damage during more than 20-seconds exposure is 60°C. The standard temperature-time RFA regime for saphenous veins with a most typical diameter up to 6 mm were investigated.
Methods: The experimental temperature dependencies on a time of the catheter surface were obtained by processing second by second readings video records during the RFA procedure for the proximal part of the saphenous vein. The information on the 30 procedures was obtained and processed by parametric statistics method. Consequent patients with primary chronic C2 venous disease (CEAP-classification) with a diameter of the great saphenous vein up to 6 mm in 3 cm below the saphenofemoral junction were included. The task of modeling the propagation of heat emitted by the catheter on the vessel wall was solved numerically using the differential heat equation. Software package COMSOL Multiphysics 5.1 was used for calculations. The temperature dependences on a time of the RFA exposure were designed for the middle (at a distance of 0.5mm from the surface of the catheter) and the outer surface (1 mm from the surface of the catheter) of the venous wall.
Results: The temperature in the middle of vein wall is more than 60°C after 2.5s. The vein wall outer surface heating exceeds 60°C at the 9th second. At 20th second of standard RFA cycle the border of "risk zone" reaches its maximum at the distance of 1.38 mm from the surface of the catheter. Two standard cycles in a continuous mode the boundary of the "risk zone" is located at a distance of 1.77mm from the surface of the catheter.
Conclusions: The safe distance from the catheter to the nerve is more than 1.38mm. It's more safely to make a pause between RFA cycles to minimize the cumulative thermal effect. This investigation is shown that it is possible to develop a special low-energy regime for veins with a diameter up to 6 mm, which would limit the irreversible thermal "damage zone" to the vein thickness and would exclude damage of adjacent structures, in particular, cutaneous nerves.

Endovenous thermal ablation and hypnosis

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Background: When performing endovenous thermal ablation of great saphenous veins, the average pain was 4.6±1.8 (ranging from 0 to 10) in a previous study (only local tumescent anesthesia had been proposed as recommended in Europe). We reassessed this pain in a series of patients for whom hypnosis was proposed in addition to tumescent anesthesia.
Methods: Non-consecutive monocentric observationnal study. The patient had to be voluntary. The usual protocol was applied for the endovenous thermal treatment. We asked the patient to evaluate his pain at the end of the procedure. All patients were treated with endovenous thermal ablation of the great saphenous vein. A hypnotic induction was performed at the operating room followed by maintenance of the hypnotic state during all the procedure. A preoperative visit was carried out to explain to the patient the technique used (Ericksonian hypnosis).
Results: 10 patients were included. The 10 patients did not report any pain (0/10). When the endovenous thermal ablation was completed, the patient came out of his hypnotic state. Patients all reported to have had sensations which they described as discomfort, but not pain. Hypnotic trans has often been considered comfortable.
Conclusions: This study on a small number of patients who were all adherent, shows that hypnosis can be a considerable contribution in our therapeutic field and this fabulous tool should be better taught to the whole medical community which often doubts its effectiveness.

Long term patient satisfaction from primary and re-do varicose vein surgery based on a one year audit with long term follow-up

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Background: With the aim to assess the quality of varicose vein treatments at our unit a one year audit was undertaken with a long term follow-up. This report deals with the case-mix and early results as well as patients' opinions regarding the long term result.
Methods: The audit was undertaken at our vascular surgery unit where all operations were registered between Sept. 2009 and August 2010. Last follow-up was attempted after a minimum of five years. Duplex assessment were repeated as were quality of life assessments (AVVQ) and assessments of disease severity (VCSS). At the long term follow-up the patients' opinions regarding symptom relief, cosmetic result and overall satisfaction were registered.
Results: Of 252 operated legs of 236 patients 69 were C2, 104 C3, 54 C4, 14 C5 and 11 C6. Median age was 55 years (16-87) and 70% were females. All patients were symptomatic with pain and swelling reported by more than 80%. Among those who had primary surgery Great saphenous vein (GSV) dominated (82%). The median GSV diameter was 9,5 mm. The great majority (91%) were day surgery cases. Re-do patients had higher VCSS (8 *vs.* 6) and AVVQ scores (27 *vs.* 16) $P<0.0001$. Complications were few and mild only one calf vein DVT and 2% wound

infections. Only five treatments were endovenous. After 69 months in median patients having had primary surgery 91% reported symptom improvement, 87% reported excellent/ fairly good/good cosmetic result and 84% were satisfied with the overall outcome. The corresponding figures for re-do surgery were 82%, 58% and 56% respectively.
Conclusions: Good long term results can be achieved following open surgery for varicose veins. The problem is how to deal with recurrence that results in poorer patient satisfaction long term.

Morphological characteristics and endovascular treatment of primary infrarenal aortic dissections

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Background: The endovascular aortic repair (EVAR) strategy of primary infrarenal aortic dissections (PIRADs) remained unclear. We proposed a morphological categorization (types I and II) based on the entry tears and the EVAR strategy of treating type I PIRADs with tubular stent grafts (SGs) and type II PIRADs with bifurcated SGs. The safety, effectivity and durability of this strategy was evaluated.
Methods: A retrospective study was conducted with 38 consecutive PIRAD patients between Jan 2010 and May 2016 in our vascular center. Endpoints were survival, SG-related complications and infrarenal aortic remodeling.
Results: The study recruited 13 type I PIRADs and 25 type II PIRADs. They were morphologically different. Type I PIRADs usually had larger true lumens and relatively smaller false lumens, while type II PIRADs had more entry tears and longer dissections. All patients underwent EVAR, with 19 tubular and 22 bifurcated SGs. The technical success rate was 94.8% (36 of 38), and the clinical success rate was 97.4% (37 of 38). During follow-up of 36 patients for an average of 28.8 months, all of them survived. No endoleak was observed, but left iliac extension occlusion occurred in 2 type II PIRADs. The CTA imaging demonstrated a good infrarenal aortic remodeling with completely thrombosed false lumens, and significant increase in the true lumen size and significant decrease in the false lumen size (P<.05).
Conclusions: The EVAR strategy based on the morphological categorization was safe, effective and durable with favorable clinical and follow-up outcomes.

Clinical result of surgery for retroperitoneal leiomyosarcoma with involvement of inferior vena cava

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Background: Leiomyosarcomas of the inferior vena cava(IVC) represent a rare form of soft-tissue sarcomas. There are limited data regarding surgical management of IVC and long-term survival. The aim was to review our institutional series of IVC resections and reconstruction for retroperitoneal leiomyosarcoma focusing on the type of vascular replacement, morbidity, mortality and long-term outcome.
Methods: From January 2005 to January 2015, 96 patients with retroperitoneal leiomyosarcoma involving IVC who underwent surgery were collected. Clinicpathologic data, surgical, perioperative outcomes and survival outcomes were obtained.
Results: The median age of patients was 47 years (range 16 to 70 years).The distribution of tumors along the IVC was as follows: upper segment (N.=12), middle segment (N.=57), and lower segment (N.=21). The percentage of high, intermediate and low grade leiomyosarcoma was 19%, 28%, 53% separately. IVC was managed in one of four ways: ligation (N.=0, 0%), primary repair (N.=58, 60%), interposition expanded polytetrafluoroethylene tube grafting (N.=33, 34%), or patch repair (N.=5, 6%). Median follow-up was 24 months, the 3- and 5-year overall survival for all these patients were 73.5% and 39.2% respectively. The margins and tumor grade has a significant effect on patient's survival(P<0.01).
Conclusions: Resection of retroperitoneal leiomyosarcoma combine with reconstruction of IVC can be performed with very low morbidity and mortality even when extensive repairs are necessary. Routinely replacement of the IVC with prosthetic graft can avoid extremity venous complications and likely contributes to quality of survival. Survival depends on tumor grade and completeness of resection, experience expertise will improve the survival of patients.

The saw-knife phlebectomy, technique and results

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Background: This instrument was introduced into our practice 30 years ago.
Methods: It consists of three parts: the blade is 3 cm long with saw teeth on one side, the handle, and a narrow shaft (10 cm). Through a stab wound the blade is driven into or near the vein. The knife is twisted round and the vein is gradually reeled up on it. Altogether 4000 limbs were operated on with primary and post-thrombotic varicosity and vascular malformations during classic and laser surgery.
Results: In primary varicosities side branches are completely removed. After inflammation, sclerotherapy, surgery or beneath a crural ulcer only partial removal or destruction could be performed. This is a rather fast technique: all tributaries and perforator veins were treated within 10 minutes. There were excellent cosmetic results mainly because only 1 - 4 stab wounds are necessary to pull out all varicose tributaries of the limb. Crural ulcer results were surprisingly good: there was no recurrence of the 27 followed (15 years) ulcers even if varicosity had recurred. Postoperative morbidity was minimal, usually suffusions (78%), haematomas (22%) and disesthesias (7%) were present. In every case these suffusions disappeared within 6 weeks, haematomas and disesthesias within 6 months. Small reticular and spider veins are not suitable subjects for saw-knife phlebectomy.
Conclusions: Saw-knife phlebectomy of varicose and incompetent perforator veins is fast and easy to perform, and has very encouraging aesthetic results even with serious CVI. We prefer to use it in large varicosity and crural ulcer cases.

Surgical procedure for incompetent perforators

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Background: There are various treatment options for the approach of the reflux at the insufficient perforating veins level: endovenous treatment, SEPS, CHIVA, surgery.
Some complex morphologic aspects of the perforators can generate treatment difficulties such as: underfascial multiple branches and single trunk above the fascia; subfascial single trunk and multiple branches above the fascia; inter-perforators anastomosis.

Methods: VANST (Varices' Ambulatory Non-stripping Surgical Therapy) is a modern minimally invasive ambulatory surgical method of taking the varicose veins out of the circuit by disconnecting the ways of their filling-up (both the venous flux and reflux are eliminated).
Through this procedure the varicose veins are left in place but they become just empty collapsed non-functional tubes. By using this technique the insufficient perforators (including their branches and anastomosis) are also closed up and the reflux at their level is eliminated.
Results: The total number of cases operated on using VANST: 2008 (in private practice-office based).
The closing-up and disappearance of the varicose veins occurs immediately in 100% of the cases. All the insufficient perforators are also closed up and the reflux at their level is eliminated.
A 5-year follow-up of 1279 cases (63,7%) showed that the recurrence of the varicose veins after VANST occurred in 89 cases (6,95%).
Conclusions: VANST is both a radical and a conservative method: the varicose veins are permanently taken out of the circuit but normal veins are preserved. VANST can be used for closing up insufficient perforators (including underfascial branches, non-saphenous perforators and the inter-perforant anastomosis).

CEREBRAL AND EXTRACRANIAL VENOUS DISEASE

Spinal multiple sclerosis: latent venous issues

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Background: From their first illustration in 1866, the unmistakable instances of multiple sclerosis (MS) of the brain have been represented by evidently or implicitly vein-centred, ventricle-based lesions. Lesion relationships to periventricular veins were yet pointed out only in 1911. The celebrated MS archetypes, however, were marked by scarring wedges invading the spinal cord via primarily its sides. David Oppenheimer first described these lesions' development via the denticulate ligaments in 1978. An attribution to excessive intraspinal volume shifts, effected by vehement venous flow reversals into varying venous compartments of the craniovertebral space surfaced in 1986.
How far spinal cord and nerve roots are suffering from downwards directed subarachnoid volume shifts due to intracranial/cervical epidural venous expansions or, instead, from upwards directed displacements on the part of abruptly distending lumbosacral/thoracic epidural veins is unknown.
Methods: No spinal MS postmortems respectively in vivo MRIs showing the cord with sufficient spatial resolution becoming accessible, the literature was reviewed for adequate pieces of evidence. Blunt lesion heads were assumed to show where the spinal cord tended to be vigorously displaced to, pointed lesion tails to point to the source of the volume shifts.
Results: Only a few fragmentary pieces of postmortem evidence gave vague hints pointing to exaggerated head-wards or sacrum-wards directed cord displacements.
Conclusions: In multiple sclerosis, the fluid and hemodynamic events underlying the injuring of the spinal cord via its ligaments are still waiting for their systematic exploration.

Efficacy and safety of extracranial balloon vein angioplasty in multiple sclerosis: a double blind sham controlled randomized clinical trial

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Background: Chronic cerebrospinal venous insufficiency (CCSVI) is characterized by restricted venous outflow from the brain and spinal cord. Whether this condition is associated with MS, and whether percutaneous transluminal venous angioplasty (PTA) is beneficial in persons with CCSVI and MS, are controversial.
Methods: We investigated this issue in 177 patients with RRMS, 62 were ineligible including 47 (26.5%) who were CCSVI-negative at echo-colourDoppler screening. They underwent a randomized, double-blind, sham controlled, parallel groups trial in 6 Italian centers. Patients were randomly allocated (2:1) to either PTA or catheter venography (sham). Two primary endpoints were assessed at 12 months: (a) a composite functional measure (walking control, balance, manual dexterity, postvoid residual urine volume, and visual acuity) and (b) new combined brain lesions on MRI, including proportion of lesion-free patients. Combined lesions comprised T1-gadolinium-enhancing lesions plus new/enlarged T2 lesions. The analysis was intention-to-treat.
Results: We planned to enrol 423 RRMS patients but only 115 were recruited in the study time fame.; 76 were allocated to PTA (31 male, 45 female; age 40.0±10.3), 39 to sham (10 male, 29 female; age 37.5±10.6); 112 (97.4%) completed follow-up. No serious adverse events occurred. Results on efficacy are still under embargo from a major journal and cannot be displayed in this phase.
Conclusions: Brave Dreams is the first multicenter randomized controlled trial to determine the efficacy and safety of venous PTA in MS patients with CCSVI.

A prolonged antibiotic protocol to treat persistent *chlamydophila pneumoniae* infection improves the extracranial venous circulation in multiple sclerosis

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Background: Stenoses and obstructions in the extracranial venous circulation have been observed in MS. One mechanism that has been proposed for the association is that the venous obstructions found in MS are due to a chronic persistent venulitis caused by the intra-cellular bacterial parasite, *chlamydophila pneumoniae* (*Cpn*). The objective of this study is to determine the effect of a combined antibiotic protocol (CAP) on venous obstruction seen in MS as measured by a quantitative duplex ultrasound examination (QECDU).
Methods: A non-randomized before-after cohort study was conducted to investigate differences in blood flow volumes pre and 6-months post antibiotic treatment for *Cpn* infection. Flow volume data was measured by QECDU across affected and unaffected sides from multiple veins segments, IJV J2, IJV J3 and vertebral vein (VV) and global arterial blood flow(GABF) was also measured.
Results: 91 patients were studied. 64 (70%) were found to have positive *Cpn* serology. There was a significant post-treatment difference (increase in flow) seen for the affected side of *Cpn* infected patients (mean difference = 56.4mls/min (P=0.022). There was a non-significant increase seen for the affected side of uninfected patients (mean difference=22.9 mls/min, P=0.215). The mean flow rate showed a commensurate decrease in the unaffected side for both infected and uninfected patients.
There was a statistically significant post-treatment increase in GABF for the infected patients (mean difference=89.9ml/min, P=0.019) and in non-infected patients (mean difference=75.8mls, P=0.009).
Conclusions: A CAP improves the extra-cranial circulation in patients diagnosed with MS as measured by QECDU. This effect is statistically significant in patients with positive *Cpn* serology, with patients with negative Cpn serology showing less benefit.

Diagnostic and endovascular treatment of venous stenosis and chronic cerebrospinal venous insufficiency

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Background: Venous pathology referring venous stenosis is common and causes serious complications including chronic venous insufficiency, venous thrombosis, pulmonary embolism and cerebral neurovascular diseases. The aim of this study is to diagnose and provide endovascular treatment of Chronic cerebrospinal venous insufficiency/ CCSVI/ and venous stenosis with different localizations.
Methods: We diagnosed 182 patients- with venous stenosis in different localizations including iliac vein stenosis compression/ May-Thurner syndrome/- 26 patients, stenosis and hypoplasia of inferior and superior vena cava- 25 patients, chronic cerebrospinal venous insufficiency/CCS-

VI/- 123 patients, subclavian vein stenosis- 7 patiens, cerebral transversal sinus hypoplasia- 1 patient. Venous stenoses were established using EchoDoppler, CT phlebography and conventional phlebography. In all patients endovascular therapy was performed including balloon angioplasty or stenting.
Results: The diagnosis of venous stenosis was confirmed with conventional angiography and phlebography. Balloon dilatation was performed in all cases of proven CCSVI. Stenosis of cava vein and iliac veins were treated with balloon dilatation and stent implantation. Venous blood flow was restored in all patients and clinical improvement was established.
Conclusions: Venous stenosis are common and can cause serious complications including chronic venous insufficiency and deep vein thrombosis/DVT/ which requires preventive endovascular treatment. Venous revascularization improves venous drainage and prevents from development of recurrent DVT and chronic venous insufficiency.

The structure of the intracranial veins and elastic-viscous properties of erythrocyte membranes in children with connective tissue dysplasia

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Background: Aim: To study the structure of intracranial vessels and elastic-viscous properties of erythrocyte membranes in children with CTD.
Methods: The main group(1) - 30 children with signs of CTD in age from 10 to 16 years. The comparison group(2)- 20 healthy children. Magnetic resonance angiography was performed on the apparatus with a field strength of 1.5 Tesla. In order to examine the state of the cytoplasmic membrane of erythrocytes were manufactured dry preparations of erythrocytes. Preparations was scanned by atomic-force microscope. Quantification of the elastic membrane was performed by calculating the Young's Modulus.
Results: In group 1 hypoplasia of the right transverse sinus occurred in 5% of cases, arteriovenous malformations - 5%, hypoplasia of the left transverse sinus - 10.5%, hypoplasia of the left sigmoid sinus - 5%, hypoplasia of the left internal jugular vein - 10.5%. In group 2 development of intracranial venous anomalies haven't been identified. Patients of group 1 had a Young's modulus equal to 182,68 MPa, in group 2 - 111,48 MPa.
Conclusions: For children with severe CTD characterized by the presence of intracranial venous malformations, higher Young's modulus of the membranes of red blood cells, indicating a reduced ability of red blood cells to deform when passing through the microvasculature.

High resolution M-mode characterization of jugular veins valves in patients with neurological and neurosensory disorders

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Background: High prevalence of valve absence was found in the internal jugular vein (IJV) of healthy volunteers by means of M-mode high resolution echo colour Doppler (ECD). However, the prevalence of valve in neurovascular disorders linked to chronic cerebrospinal venous insufficiency is still unknown.
Methods: A cohort of 83 healthy controls (HC) (35M - 48F, 25.7±6.7 y.o.), 71 multiple sclerosis (MS) (35M-46F, 40±10 y.o.), 99 Inner Ear Disorders (IED) (43M - 56F 59±12 y.o) underwent ECD investigation of the neck veins, including M-mode evaluation of the IJVs junction valve plane, in standardized postural and respiratory conditions. The outcomes were: valve presence, morphology and motility, the rate of haemodynamic alteration linked to the valve characterization. Institutional Review Board approval was obtained.
Results: Bilateral valve presence was found in 38% of HC, 58% of MS and 25% of IED, whereas, bilateral valve absence was recorded in 16% of HC, 10% of MS and 26% of IED ($P<0.004$). Bicuspid morphology was the more prevalent presentation in HC 56%, while monocusp was more frequent in patients: 75% MS and 57% IED ($P<0.0001$). The main finding was the presence of mobile valve leaflets found in 98% of HC, conversely fixed valve leaflets were recorded 82% MS [OR (95%CI) 226 (51-999), $P<0.0001$] and in 41% of IED [OR(95%CI) 34 (8-148), $P<0.0001$]. Finally, not mobile valve leaflets were found significantly associated to bi-directional and/or absent flow.
Conclusions: In patients a significant higher rate of valve presence, functionally not mobile was found. The latter is strongly associated to brain outflow abnormalities.

The collateral venous pathways of brain and spine: safely compensatory?

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Background: Principal and collateral channels of the brain and spine's venous drainage are notorious for their variations and their behaving in unpredictable ways. How far the collateral venous channels are capable to compensate for deficiencies of the principal ones is generally evaluated simply in observing the sequelae of venous obstructions.
Methods: To determine the collateral venous channels' potential compensatory function, the flow conductivity of the main and collateral channels of the cerebral venous drainage has been compared. This at critical and neither compressible nor expandable passages of their paths. Anatomical observations made in 210 human skulls, each with known cranial volume, complemented by data from the literature were used for clarifying this point.
Results: The different venous outlets of the human skull relate in contradictory ways. This conflicts with the widespread assumption the venous collaterals were the wider, the narrower the main venous passages are. In individual skulls, the conductivity of the cranial venous outlets as a whole was thereby found to be a tenth of the one found in others.
Conclusions: The collateral veins' capacity to compensate hindrances to the ordinary venous outflow varies extraordinarily. The requirement to estimate their functional reserve calls for decided efforts to evaluate the subject in using the tools of computational hemodynamics.

Hemodynamics, the key to cause and (interventional) cures in multiple sclerosis

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Background: Veins have been shown to be central to the emergence of cerebral multiple sclerosis lesions. The pertinent in vivo and post-mortem evidence indicates an involvement of circumscribed sectors of primarily larger tributary vessels of the internal cerebral veins. Affected

and non-affected vein parts, as well as tissue compartments, were never found to differ a priori in any respect. The circumscribed changes must accordingly be determined by factors relating to, and by forces acting via the lesion veins, *i.e.* by hemodynamic circumstances.
Methods: The study grounds in a comprehensive review of the venous and vein-related findings made in multiple sclerosis only. In putting together these changes' specific traits, it is sought to identify the hemodynamic factors which have here been at work.
Results: The given pieces of evidence point to an involvement of retrograde blood displacements respectively of retrograde pressure propagations in the lesion veins. To events, whose biomechanical background still awaits a thorough exploration.
Conclusions: Veins appear capable of actively assailing cerebral structures, sporadically or intermittently, in various changeable ways. Elucidating the underlying biomechanisms should pave the way to interventional cures of specific instances of multiple sclerosis

DRUGS IN PHLEBOLOGY

Idarucizumab's cross-reaction with melagatran and other benzamidine-containing compounds

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Background: Idarucizumab is an anti-dabigatran Fab fragment that binds to the benzamidine group on dabigatran and inhibits its anti-thrombin activity. Aim: To determine the relative specificity for benzamidine, as a sole antidote for dabigatran.
Methods: Anti-thrombin agents such as: anti-factor Xa (rivaroxaban, apixaban and DX-9065a) and argatroban, melagatran, hirudin, bivalirudin, human antithrombin, thrombomodulin, heparin cofactor II, and heparin-AT complex were supplemented to citrated plasma at [0.1 to 100 μg/mL]. Idarucizumab was added to each mixture at [1 mg/mL] and anticoagulant activity was assessed using prothrombin time (PT), activated partial thromboplastin time (aPTT), thrombin time (TT), anti-IIa/Xa and thrombin generation assays.
Results: The antibody showed strong specificity for the inhibition of dabigatran and did not affect the anticoagulant and other effects of the other synthetic and natural thrombin and FXa inhibitors with the exception of melagatran. The prolongation of the PT, aPTT and TT by melagatran was completely inhibited by idarucizumab. Idarucizumab inhibited more effectively the prolongation of TT time by dabigatran than the prolongation induced by melagatran.: Idarucizumab itself did not produce any effect on whole blood or plasma clotting profile at [<1.0 mg/ml].
Conclusions: A common benzamidine may be the reason of the cross-reactivity of idarucizumab with melagatran. The benzamidine is present in a number of serine protease inhibitors as well as drugs such as pentamidine, propamidine and dibromopropamidine. It is suggested that simultaneous administration of idarucizumab may compromise the pharmacodynamic profile of benzamidine derived drugs such as: anti-malarials, anti-psychotic, anti-fungal etc.

Combined use of micronized purified flavonoid fraction with oral rivaroxaban increase deep vein recanalization

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Background: to assess the impact of long-term using of micronized purified flavonoid fraction (MPFF) in the treatment of proximal deep vein thrombosis (DVT).
Methods: it was a pilot randomized open-label study enrolled patients with the first episode of popliteal-femoral DVT confirmed by duplex ultrasound (DUS). All participants were randomized into two groups: control, that received a standard treatment with oral rivaroxaban and graduated compression stockings (20-40 mm Hg), and experimental, that required additional treatment with MPFF 1000 mg/day. Both drugs were used for 6 months. Patients were followed-up for the whole period of treatment with series DUS every 2 months to evaluate the degree of recanalization by the compressibility of popliteal (PV), superficial femoral (SFV) and common femoral (CFV) veins. The extension of thrombi was assessed by modified Marder score at the baseline and at 6 months.
Results: 40 patients were randomized into the control (N.=18) and experimental (N.=22) groups: 27 men and 13 women, mean age of 57,1±14,3. The median of Marder score at baseline was 15,5 in the main group and 9,5 in the control group (P<0,0001). After 6 months of treatment, the Marder score reduced to 0 in the main group and to 2,0 in the control one (P=0,015). The generalized linear model repeated measures found more intensive reducing of Marder score (p<0,0001) and increased speed of recanalization on CFV (P=0,016), SFV (P=0,03) with a non-significant tendency on PV (P=0,189) in the main group compared to the control one. Full recanalization of PV at 6 months was observed in 14 of 22 patients, received MPFF, and only in 4 of 18 persons of the control group (P=0,012).
Conclusions: MPFF using can improve deep veins recanalization in patients with proximal DVT treated with oral rivaroxaban.

Unfractionated heparin, antithrombin and recombinant thrombomodulin: comparative anticoagulant effects and their vascular and hematological implications

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Background: Unfractionated heparin (UFH), antithrombin (AT) and recombinant thrombomodulin (rTM) are all anticoagulant/antithrombotic agents. Currently, a rTM (Recomodulin©) is undergoing clinical trials for vascular and hematologic indications. The aim is to compare their anticoagulant and platelet modulatory effects.
Methods: The effects of UFH, AT and rTM at 0-5 μg/mL were measured on glass activated clotting time (ACT) and thromboelastography (TEG). The prothrombin time (PT), activated partial thromboplastin time (aPTT) and thrombin time (TT) were measured in citrated whole blood and retrieved plasma. The effect of these drugs on agonist induced platelet aggregation (arachidonic acid, adenosine diphosphate, collagen, thrombin and epinephrine) was measured in platelet rich plasma from healthy donors.
Results: The rTM, in contrast to AT/UFH, showed no anticoagulant effects in ACT and TEG at 1.25 μg/mL. At up to [5.0 μg/mL], rTM was a much weaker anticoagulant. In the clotting assays, all agents produced anticoagulant effects in the following order: UFH>AT>rTM. The UFH mildly increased aggregation with some agonists. The AT and rTM did not produce any effects at up to [5 U/ml and 10 μg/ml], respectively, for all of the agonists except thrombin.
Conclusions: The rTM is a much weaker anticoagulant *versus* UFH and AT, and at therapeutic concentrations, it does not produce measurable anticoagulant effects. The circulating levels of rTM for the management of vascular disorders range from 0.5-1.5 μg/mL. At supratherapeutic concentrations of >2.5 μg/mL, which may occur in patients with renal dysfunction, rTM exhibits weak anticoagulant effects unlikely to cause bleeding.

Tinzaparin in intermediate dose for the treatment of superficial vein thrombosis: results from an observational multicenter study - The Seven Study

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Background: Low molecular weight heparins are recommended in the treatment of superficial vein thrombosis (SVT) but with low grade of evidence. This study was conducted to assess the treatment outcomes of acute SVT with intermediate dose of Tinzaparin.
Methods: Retrospective analysis of records from outpatients over a period of 16 months treated in 7 centers with Tinzaparin 0.5 ml (10.000 000 ant-Xa IU) once daily for a period that was at the treating physician's discretion. All patients were followed-up of at least 12 weeks.
Results: 296 patients (189 females, mean age-57.4 years) were included. Two third of the patients (191/296, 64.5%) received treatment for approximately 5 weeks (mean 36.9 days) and the remaining (105/296, 35.5%) for a shorter period (mean 16.2 days). There was no difference in patients' characteristics between the two treatment duration groups. Presence of thrombus above the knee and restricted daily activity were the associated with longer period of treatment. Only one case with minor bleeding was observed. Recurrence of thrombosis over a 12-week follow-up period occurred in 6% (SVT in 14 - 4.7%, DVT in 3 - 1% and thrombus extension in the superficial veins in 1 - 0.3%). Recurrence was not related to the duration of treatment.
Conclusions: Intermediate dose of Tinzaparin was an effective and safe treatment for SVT in the setting of real world practice. Location of thrombus and status of patients' mobilization were associated with longer duration of treatment. Future prospective randomized studies are needed to corroborate these findings.

The incidence of venous thromboembolism postoperatively in patients undergoing total hip and knee arthroplasty that used aspirin as thromboprophylaxis: a single center, retrospective analysis

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Background: Total joint arthroplasty (TJA) poses serious risks for the development of venous thromboembolism (VTE). Pharmacological thromboprophylaxis significantly reduces the incidence of post-operative VTE. Aspirin is often a preferred agent due to ease of administration and economic benefit. The aim is to report efficacy and safety of Aspirin *versus* non-Aspirin (unfractionated heparin, low molecular weight heparin, warfarin and new oral anticoagulant agents) in VTE thromboprophylaxis following total hip arthroplasty (THA) and total knee arthroplasty (TKA).
Methods: We performed a single center, retrospective analysis included 400 patients undergoing THA and TKA between July 2015 and June 2016, receiving either Aspirin or a non-Aspirin agent as thromboprophylaxis. In-hospital incidence of VTE and bleeding outcomes were compared between the groups.
Results: In-hospital VTE occurred in 13 (6.5%) patients in the non-Aspirin group and 0 patients in the Aspirin group (P<.001). Deep vein thrombosis (DVT) occurred in 11/13 patients in non-Aspirin group and 2/13 had pulmonary embolism (PE). Post-operative venous Doppler ultrasonography was performed more frequently in the non-Aspirin group (48% *versus* 8%, P<.001). Prior VTE history was also higher in the non-Aspirin group (11% *versus* 4.5%, P=.015). There was no statistically significant difference in major bleeding between the groups (P=0.58).
Conclusions: Post-operative thromboprophylaxis with Aspirin resulted in a lower in-hospital documented VTE incidence, and no significant difference in bleeding. These results may have been influenced by the lower utilization of venous Doppler ultrasound in the Aspirin group. A randomized prospective trial to compare Aspirin to anticoagulant agents post TJA is needed.

The efficacy of rivaroxaban for endovenous heat-induced thrombosis treatment

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Background: The aim of our study was to investigate the efficacy of rivaroxaban for the endovenous heat-induced thrombosis (EHIT) treatment after endovenous laser ablations (EVLA).
Methods: Prospective noncomparative study includes 1326 patients who had 1514 EVLA over the period from September 2015 to February 2017. In 1091 (72,1%) cases the great saphenous veins (GSV) were ablated. The anterior accessory veins (AASV) were treated in 124 (8,2%) cases and small saphenous veins (SSV) were treated in 299 (19,7%) cases. The EHIT were found out in 21 (1,4%) cases. 19 (1,7%) patients had EHIT of GSV and in 2 (1,6%) cases there were EHIT of AASV. We didn't observed any EHIT after treatment of SSV. All the patients with EHIT were prescribed rivaroxaban.
Results: According to Kabnick classification it was the 1st class EHIT in 9 (0,6%) cases, the 2nd class in 10 (0,7%) cases and there were only 2 (0,1%) cases of 3rd class EHIT. All the patients were prescribed rivaroxaban 15 mg twice a day. We had to stop of using rivaroxaban for 1 (4,8%) patient because of dyspepsia. In this case we began to use enoxaparin in therapeutic dosage once a day. It was a complete regress of EHIT over the period of 6-25 days in all cases. In 1 (4,8%) case there was nose bleeding without major complications. This patient went on using rivaroxaban. There were no cases of pulmonary embolism.
Conclusions: Rivaroxaban is an effective medicine for EHIT treatment. The other investigations are needed to point its efficacy and safety.

Sulodexide recovers endothelial function through reconstructing glycocalyx in the balloon-injury rat carotid artery model

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Background: Vascular therapies have mostly focused on repairing endothelium, but little attention has been paid to the reconstruction of glycocalyx, which covers endothelium and protects the function of endothelial cells. Sulodexide has a similar glycosaminoglycan structure to glycocalyx, so it is assumed to be effective in remodeling the damaged glycocalyx and resulting endothelial function.
Methods: We assessed the effort of sulodexide on glycocalyx remodeling in the balloon-injury rat carotid artery model. Electron-microscopy was used to examine the reconstruction of glycocalyx. We evaluated endothelial healing, endothelial function, and inflammatory factors using immunohistochemistry. Blood samples were collected to assess coagulation and lipid metabolism. Animal experimental study have prior ethics approval from institutional authorities.

Results: Electron micrographs showed that sulodexide could reconstruct the endothelial glycocalyx. As for the function of endothelium, sulodexide promoted endothelial nitric oxide synthase level, attenuated endothelial hyperplasia, and inhibited platelet aggregation that benefitted from glycocalyx reforming. Sulodexide decreased the glycocalyx damage related expression of CD31 and intercellular cell adhesion molecule-1, accompanying with the downregulation of leukocyte counts and C-reactive protein. The levels of atherosclerosis-related factors increased in activated endothelial cells for the glycocalyx damage, namely osteopontin and vascular cell adhesion molecule-1, were normalized by sulodexide. Combining with the benefit of glycocalyx reconstructing, sulodexide reversed the dyslipidemia. Moreover, sulodexide prevented CD68-positive inflammatory cells infiltration into the vascular wall, presumably as the effect of glycocalyx reconstruction.
Conclusions: Sulodexide reconstructed glycocalyx which preserved endothelial function and attenuated the expression of inflammatory factors, and regulated coagulation and lipid metabolism, all of which are important for vascular healing.

Sulodexide therapy after endovascular or hemodynamic treatment for varicose veins

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Background: Sulodexide, a highly purified glycosaminoglycan, has antithrombotic and anti-inflammatory properties with reported benefits in Chronic Venous Disease (CVD). Varicose veins (VV) are a manifestation of CVD and are characterized by symptoms and signs produced by pathological action of venous hypertension and endothelial inflammation. The surgical removal of VV eliminates the "hemodynamic" problem, but leaves the underlying patient's vulnerability to CVD pathology unchanged. Therefore the most comprehensive therapeutic approach to VV should include a combined therapy to obtain hemodynamic correction and endothelial protection, by using endovascular surgery and Sulodexide.
Methods: A retrospective analysis has been performed on a large cohort of patients with VV and treated with Sulodexide for 6 months (500 LSU/day) after endovascular or hemodynamic venous treatment checked clinically with a patient questionnaire and in a restricted group of patients with Photoplethysmography (PPG)
Results: The preliminary results show that Sulodexide improves signs and symptoms of legs by reducing heaviness, swelling and inflammation, both after 30 days and 6 months after venous treatment, with a better QOL compared with patients who were treated with only the hemodynamic pattern. To confirm those promising clinical outcomes, a group of 30 patients which were previously studied with PPG test, were controlled with the same modality up to three and six months after the venous procedure obtaining significant results
Conclusions: Waiting for further confirmations, Sulodexide therapy of VV patients after endovascular or hemodynamic venous treatment, seems to improve the outcome of the procedure in the short and middle term follow-up.

Sulodexide as and adjunctive management in patients with venous leg ulcers

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Background: Sulodexide is a highly purified glycosaminoglycan used on the management of venous disease and known for its antithrombotic properties, as well as for the reparative effect it has on venous endothelial glycocalix. The patients with varicose veins and associated leg ulcers have a proinflammatory state in which glycocalix plays an important role. We studied the effect that sulodexide associated to reflux corrective surgery has on shortening the healing time of varicose vein ulcers.
Methods: We studied 65 patients with varicose veins, great saphenous vein or short saphenous vein reflux and associated leg ulcer that required a reflux corrective procedure. All patients were under the CEAP 6 classification. Duplex scan was performed preop in all patients and reflux of the great or short saphenous veins confirmed. 35 patients were random assignated to receive sulodexide (Vessel Due F, Alfa Wassermann) 250 LRU twice a day one week before surgery and for 8 weeks after surgery. 30 patients were just taken to the procedure with the standard preop and postop care. All patients used postop 18-22 mmHg compression for 8 weeks at least.
Results: Of all the patients we obtained a complete healing of the ulcer in 8 weeks in 88%. While in the sulodexide group we obtained a 91% complete healing at 8 weeks in the surgery alone group we obtained a 83.3% complete healing at the same time. QOL measured by CIVIQ 20 questionaire was 89 for the sulodexide group and 78 for the surgery alone group at 4 weeks postop
Conclusions: Sulodexide is a glycosaminoglycan that can add benefits to the reflux corrective surgery in terms of shortening the time to complete heal, and improving the QOL of patients with leg ulcer associated to varicose veins.

Use of elatec (MPFF) as monotherapy for postoperative symptoms control after endovenous radiofrequency ablation

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Background: To dertermine that the micronized purified flavonoid fraction, after endovenous radiofrequency ablation, diminishes postoperative symptoms in patients with chronic venous disease.
Methods: Randomized trial comparing two groups: control group (endovenous radiofrequency ablation) and Elatec group (endovenous radiofrequency ablation with Elatec postoperatively). A complete CEAP classification, Venous Clinical Severity Score, Visual Analogue Scale of the postoperative symptoms (pain, heaviness, restless legs, swelling, paresthesia, and hematoma), and a CIVIQ-14 quiality of life questionnaire was performed to determine postoperative symptoms.
Results: The study included 549 female patients treated with radiofrequency between January 2014 and January 2016: 275 in Elatec group and 274 patients in control group. The posoperative Venous Clinical Severity Score in the Elatec group was 2.4 points and in the control group was 5.1 points. The Venous Clinical Severity Score and the CIVIQ-14 quality of life questionnaires improved in both groups, but the scores improved significantly in the Elatec Group.
Conclusions: The majority of the patients with symptomatic chronic venous disease benefit from endovenous radiofrequency ablation of incompetent saphenous veins. The addition of Elatec in the postoperative period offers a simple, single drug management of the short-term postablative symptoms. The treatment improves the benefit of the surgery by reducing pain, heaviness, swelling and hematoma formation with no drug side effects.

GLUE ABLATION

New techniques for cyanoacrylate injection of saphenous veins and tributaries

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Background: Commercial cyanoacrylate (CA) is now available for direct injection under ultrasound guidance for saphenous veins or for tributaries deep to the surface. We have used cyanoacrylate embolization (CE) for more than 100 venous territories over the past 9 months for primary and recurrent varicose disease using Venablock and Veinoff polymers.
Methods: The proprietary mixture for Venablock polymer contains n-butyl cyanoacrylate (NBCA) while that for Veinoff polymer contains 2-octyl cyanoacrylate (OCA). The Venablock preparation is less viscous than Veinoff while Venablock polymerization is faster than for Veinoff, and either is selected on the basis of anticipated rate of injection. If treatment is required, these are now offered for saphenous reflux for veins <4mm diameter, deeper tributaries of any size, neovascularization and perforator reflux. Preparations are being developed for superficial tributaries. The Venaseal technique is preferred for larger saphenous veins.
Results: Preliminary results show an occlusion rate for long segments after a single session of treatment in more than 90% so that these forms of CE are now preferred to ultrasound-guided sclerotherapy (UGS) due to perceived better occlusion rates with fewer treatment sessions required. However, patient concerns include injection of a foreign substance and cost. Differences in technique compared to UGS will be described. Further development of these techniques promises to provide an alternative to UGS in many patients.

Experience with cyanoacrylate catheter embolization for saphenous reflux

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Cyanoacrylate embolization (CE) by the Venaseal catheter technique has been used to treat more than 200 refluxing saphenous veins over a 3-year period. N-butyl cyanoacrylate (CA) is delivered at 3cm intervals along the vein from 5cm distal to the saphenous junction under ultrasound guidance. CE is offered as preferred treatment for all patients requiring intervention for saphenous reflux with vein diameter ≥4mm. Reasons to prefer to endovenous thermal ablation (ETA) include no need for tumescent anaesthesia and quicker recovery, while it is considered to have more reliable outcomes compared to ultrasound-guided sclerotherapy. Reasons for refusal were concern as to embolism, dislike of having a permanent foreign substance implanted and cost. As a result, more than 700 veins were treated by ETA in the same period. Cumulative occlusion rates were similar in the two unmatched groups with 95% occlusion for CE at 12 months. Quality of life scores were significantly improved after CE. Recurrences were all for veins greater than 6mm diameter since when a double dose of CA is delivered for larger veins or at segments of dilatation. Measurements of the upper end of occlusion shortly after treatment showed 90% were within the 5cm from the junction with just one protruding into the deep vein. Most patients had little post-operative pain or inflammation but 15% developed a significant inflammatory reaction along the vein, often just on one side after bilateral treatment.

Ultrasound appearances following cyanoacrylate adhesive (CA) closure of incompetent veins

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Background: Cyanoacrylate adhesive closure of incompetent veins is gaining in popularity as a non-thermal treatment modality and some believe may eventually replace EVLA as the preferred primary treatment for incompetent saphenous veins.
The rapid rise in popularity of this method however has not been matched with information regarding expected and unexpected appearances following treatment.
Methods: Follow-up ultrasound images from patients having undergone prior CA closure were retrospectively reviewed to determine the range of appearances encountered and significance of these appearances.
Among other things the following was observed:
- Distance of CA from junction with deep vein (SFJ or SPJ) compared to expected position of CA
- Completeness of closure
- Echogenicity of CA
- Presence or absence of "flow channels" within the treated vein
- Degree of inflammatory change in the peri venous tissues
- Presence or absence of thrombus within branch vessels
- Changes in these appearances over time

Results: The presentation will take the form of a "pictorial essay" demonstrating the range of findings encountered following CA closure and potential significance of these findings.
Conclusions: Despite enthusiastic and aggressive marketing of CA closure, little is published about the expected and unexpected findings following treatment. This paper aims to lead the way to encourage further research in understanding the outcomes of this treatment and the role of ultrasound in monitoring and follow-up after treatment.

Direct injection of cyanoacrolyate adhesive (DICA) to obtain closure of a proximal great saphenous vein (GSV) venous aneurysm (VA) following failed endovenous laser ablation (EVLA)

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Background: A 57yr male presented with an increasingly painful left "groin lump" and painful left leg varicose veins.
Ultrasound showed the "lump" to reflect a thrombosed 30mm x 20mm GSV VA commencing 15mm below the SFJ. Gross incompetence of the GSV was noted as was extensive superficial venous thrombosis (SVT) with the GSV and branch varicosities.
Thrombus was aspirated under local anaesthetic resulting in immediate symptomatic improvement and Clexane (subcutaneous LMWH) was administered at a dose of 1mg/kg BD for 6 weeks.
At six weeks, most of the GSV thrombus and all the VA thrombus had resolved and EVLA of the incompetent GSV was undertaken using the following parameters:
1470nm Radial Slim fibre, LEED proximal GSV to include VA=150j/cm, LEED elsewhere 75j/cm.
Follow-up 4 days post EVLA showed successful closure of the treated GSV except for the VA.
Three seperate injections (0.2ml, 0.3ml & 0.2ml) of a viscous CA were then made directly into the VA under ultrasound guidance. The delivery mechanism was a 22g needle mounted on a 3ml leur lock syringe. Firm local manual compression was administered for 90 seconds following each injection.

Repeat ultrasound assesment was immediately performed after each injection to ensure successful closure. The first two injections resulted in partial closure and the third complete closure of the VA with cessation of color flow within the VA observed in real time.
The VA remained closed at 6 weeks and further follow-up will be ongoing at 3, 6 and 12 months.
Conclusions: Although long term follow-up is awaited, short term follow-up in this case suggests that DICA may be worth considering as a treatment option in cases of failed endovenous VA closure.

Endovenous laser, sclerotherapy and vein gluing combined as a single catheter procedure for saphenous veins. Initial experience

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Background: Gluing of veins is discussed as being superior to thermo-occlusive methods or sclerotherapy as it may achieve immediate and permanent vein closure. Furthermore, no tumescent anesthesia is required. However, approved gluing methods use continuous placement of aggressive and hardly resorbable cyanoacrylate (VenaSeal, VariClose, VenaBlock), while sparing the junction. Segmental glue application is preferred by some intervestigators meanwhile, but this leaves native endothelium and thus a source of relapse. All these drawbacks could be overcome by a new modality which combines endovenous laser for the junction, followed by segmental or pointwise gluing and catheter sclerotherapy.
Methods: 22 patients (16 f, 6 m, 42 – 72 yr.) with GSV insufficiency and diameters of 8 - 22 mm Ø (mean: 9.2 mm), length 43 – 62 cm (mean 55.1 cm) underwent endovenous laser (940-1470 nm) for a 8 cm long junction segment ("laser crossectomy"), followed by a Scleroglue® procedure, comprising sclerotherapy (Aethoxysklerol 1%, 1+4 with air) and acrylate spot gluing, using a single coaxial catheter access. No external compression media were used post treatment except a film bandage for superficial varicosities. Follow-up was performed next day and 2 – 6 – 12 months.
Results: All cases (22/22) showed immediate saphenous occlusion and reflux elimination. Day one examinations showed the saphenofemoral junction closed without any stump (22/22). Procedural time from first puncture to access closure was 9:30 – 15:30 min. (mean: 11:45 min). At one year follow-up, all cases showed total occlusion, including the junction.
Conclusions: Combining laser crossectomy and ScleroGlue®, optimal morphological and functional results could be obtained in this small initial experience. However, the procedure will not be suitable for cost-effective clinical routine application as long as there is no approved device available for *e.g.* less than 500 USD.

Venaseal™ (cyanoacrylate) for chronic saphenous insufficiency – early results of a single center experience in Australia

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Background: Cyanoacrylate is an innovative non-thermal alternative treatment for saphenous vein insufficiency. This novel technique was first described in 2011 with subsequent safety and efficacy for chronic varicose veins shown in 2014. This Australian observational single center study is aimed to assess the experience, efficacy and safety of VenasealTM therapy.
Methods: 94 patients, mean age 57 years, 59% females with 145 limbs were treated for saphenous vein insufficiency from November 2014 to July 2017. Patients were assessed clinically by experienced vascular sonographers pre and post- procedure with a comprehensive duplex-scan. Scheduled follow-up visits were at 1 and 4 weeks, and then at 3, 6, 12 months and yearly to check for occlusion of targeted trunks. During 1 week scan patients were also checked for DVT.
Results: 197 trunks (GSV-143/ SSV-54) were treated of a total of 134 incompetent limbs. The average therapy duration of a full-length GSV was 30 minutes. Pain was rarely reported post-procedure. Mean follow-up is 19.6 months and no recanalization has been reported. There was 1 GSV segmentally occluded, related to technique factors and 5 cases of symptomatic thigh phlebitis requiring medical treatment with satisfactory resolution.
Conclusions: Venaseal procedure time is longer than ERFA. However, 100% of the trunks treated remain occluded during follow-up period, and it seems to be virtually pain free with no down time required.

Clinical outcome of ultra-rapid acting cyanoactylate embolization compared with micro-pulsed laser ablation

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Background: Ultra-rapid acting n-butyl cyanoacrylate (uNBCA) is introduced as a new non-thermal and non-tumescent endovenous ablation modality. Micro-pulsed YAG laser (1320nm, 100 microseconds pulse duration) has also provided a more advanced thermal modality that provides painless ablation using a bare fiber.The aim of this study is to retrospectively compare uNBCA based ablation with endovenous micro-pulsed laser ablation (EMPLA).
Methods: Since June 2016, there were 120 patients with incompetent varicose veins who were treated with an endovenous embolization of uNBCA (N.=60) or EMPLA (N.=60). The preprocedural, intraprocedural, postprocedural and follow-up data of the patients was collected and restrospectively compared.
Results: The mean age was 63±11 in the uNBCA group and 68±10 in the EMPLA group. The average length of treated veins was 32.4±10.7 cm and 27.0±9.8 cm respectively, while 472±147 mL of tumescent anesthesia was used only for EMPLA. The average procedure time was 27.3±10.8 and 32.6±11.2 minutes respectively. uNBCA delivery was accomplished within 20 seconds during the target vein embolization, whereas it took a much longer 258±89 seconds in the EMPLA group. At the end of the treatment, all procedures were successfully occluded in the both groups, and the total occlusion rate was 96% and 100% at 6 and 12 months. The venous clinical severity score improved significantly with no quantifiable difference between groups. Postprocedural phlebitis was observed in 10 patients (17%) only in the uNBCA group, and the analgesic medication rate was significantly lower in the EMPLA group (0%) than in the uNBCA group (10%).
Conclusions: The uNBCA is a fast and effective treatment that saves procedure time, and is without tumescent, compression stockings and thermal damage. However, there is one minor pitfall; postprocedural phlebitis is more likely to occur after uNBCA than after EMPLA.

The treatment of great and small saphenous vein insufficiency using a cyanoacrylate glue: my experience

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Background: The treatment of saphenous veins insufficiency has undergone a substantial change in the last years. A new method using a Cyanoacrylate glue, has recently been approved being as efficacious as endothermal ablation, without the need of perivenous tumescent anaesthesia (TA). The aims of the study were to evaluate the complete occlusion of the treated vein and the incidence of post-procedural pain and complications.
Methods: 52 patients (55 saphenous veins: 49 great and 7 small saphenous veins) were enrolled in our department between November 2015 and June 2017. The inclusion criteria were: insufficiency of the great or small saphenous vein, a diameter while standing of 5-12mm, a navigable trunk, no previous history of DVT, PE or thromboflebitis. The patients underwent the treatment following the known protocol published in previous papers. We decided to treat at the same time the visible varicose branches by phlebectomies under TA. All the patients wore a II class elastic stocking for 1 week.
Results: Patients underwent a clinical and echocolodoppler examination at day 3, day 7, at 3 months and 1 year. The presence of pain, the use of pain killer and the occlusion of the vein were reported. At day 3 none of the patients experienced pain in the treated trunk, while 22 out of 50 patients experienced light to mild pain in the site of phlebectomies. At day 7, 6 patients reported some discomfort along the treated trunk, that did not required the use of pain killers, while 5 patients, 4 at day 10 and the other at day 14, had an intense inflammatory reaction that required antinflammatory medication for 5-7 days. The occlusion rate at day 3 and 7 was of 100% with a residual competent stump 1 to 5cm long. At 3 months 3 cases out of 52 patients had a refluxing stump. We did not have any DVT. At the 3 months visit, all the patients stated that they would have chosen again this kind of treatment except 2.
Conclusions: The use of the cyanoacrylate adhesive is safe, effective and simple. The possibility to treat more than one saphenous vein in the same session, could be very attractive with a rapid return to work. Longer follow-up are needed to compare this new method with the other endovascular treatments.

Direct injection of cyanoacrylate adhesive into perforators (DICAP)

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Background: To describe a new and simpler method of closing an incompetent perforator vein (IPV) using cyanoacrylate adhesive (CA).
Methods: A targeted ultrasound study is performed to plan the optimal entry pathway to cannulate the IPV so that spread of CA into the deep system or surface tributaries is limited and injury to the accompanying perforator arteries is avoided.
The IPV is cannulated directly using a 22g needle connected to a 3ml syringe containing 0.3ml of a viscous cyanoacrylate adhesive.
Real time ultrasound guidance and tactile response are used to confirm intraluminal needle placement in the IPV. Ultrasound probe (heel toe pressure) and assistants hand pressure (if needed) is used to coapt the vein to be injected and limit CA spread into the deep system. The target IPV is then slowly injected with 0.1-0.3ml of CA. Polymerisation of the CA is observed in real time and then firm local pressure (hand and or probe) is applied for 90 seconds.
Treatment success is confirmed immediately with ultrasound imaging showing echogenic CA in the perforator vein and the absence of retrograde colour flow.
Results: At the time of submission, perforator closure rate with this technique has been 100%.
Conclusions: The DICAP technique is an alternative to perforator EVLA enabling the skilled operator to close the majority of IPV's regardless of tortuosity or position adjacent to vital structures.
DIACP is extremely well tolerated, effective and much simpler to perform than the previously described CAPE technique and does not require any special delivery devices.

Modified Venaseal™ technique for treating small diameter straight veins

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Background: To describe a modification of the standard Venaseal™ technique for the treatment of small diameter incompetent straight veins.
Methods: One problem the author encountered with use of the Venaseal™ closure device was that manipulation of the blue 7Fr introducer sheath over the guidewire induced venous spasm in small diameter (<5 mm) veins to the degree the procedure could not be performed in several cases when trying to treat incompetent anterior accessory saphenous veins.
In subsequent cases, vasospasm has been avoided by directly advancing the 5 Fr glue catheter through a 7Fr diameter micro-introducer sheath. The 5 Fr glue catheter is quite fragile and prone to kinking but with careful and gentle manipulation of the glue catheter, treatment of straight veins as small as 2mm has been accomplished without difficulty.
Results: In addition to saphenous veins, anterior accessory saphenous veins and incompetent straight saphenous branches and post stripping incompetent below knee GSV segments have been successfully treated using both antegrade and retrograde approaches.
Conclusions: Straight veins smaller than 4mm in diameter may be successfully treated with Venaseal ™ by modification of the standard technique as described above.

HEMODYNAMICS

Hemodynamic changes after varicose vein surgery

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The objectives of varicose vein tests are anatomic localization and quantification of the reflux. Ambulatory venous pressure (AVP) has been used for the evaluation of venous hemodynamics. AVP is measured by inserting a needle into a vein on the dorsum of the foot, which is connected through a pressure transducer and the hemodynamic parameters are measured. Because of invasiveness, it cannot be repeated frequently nor be used as a screening test. Air plethysmography (APG), first introduced by Christopoulos *et al.*, is a noninvasive technique, which can measure relative volume changes in the lower limb in response to postural alterations and muscular exercise. The results of APG have been shown to correlate well with AVP and it has been used for measuring the quantitative hemodynamic information of varicose veins. APG can be used in conjunction with duplex ultrasound to provide better information concerning venous function. Duplex ultrasound is the most useful examination for evaluating venous valvular incompetence, but it provides relatively little quantitative hemodynamic information. Several studies have been shown that APG is useful to diagnose and quantify venous reflux and to evaluate the clinical severity of chronic venous insufficiency. APG provides reproducible hemodynamic measurements that can be evaluated noninvasively in serial examinations.

APG is now widely used for the preoperative examination of varicose veins, but there are only few studies that have compared the hemodynamic changes in varicose veins before and after operation. The published results of the comparative data of hemodynamic improvement between treatment modalities are limited.

Our study was conducted to assess the hemodynamic changes after varicose vein surgery by means of air plethysmography and to compare the hemodynamic changes according to the treatment modalities.

COMPRESSION

Shape memory textiles for functional compression management

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In compression therapy by using textile products such as bandage, there exists huge challenge to manage the level of pressure during the course of compression. Moreover, achieving target level of pressure is also difficult during wrapping because of varying circumference and stiffness for different limbs. This work relates to the development of a smart compression system using shape memory polymeric filaments. Smart filaments are incorporated in the structure of stocking which allows controlling the level of pressure externally at ambient conditions. Experimental results showed that the pressure can be controlled by supervising the surface temperature of stocking. Extra pressure generated by the stocking depends on the level of temperature and initial extension ($P<0.05$). The shape memory compression system could have immense potential for compression management as this would give more freedom to govern pressure level whenever needed during the course of compression therapy.

CASE PRESENTATIONS

Floating thrombus at GSV junction – a chance of instantaneous endovenous repair

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Background: A 75 year-old male patient (former general practicioner) presented for ultrasound examination with moderately symptomatic varicose veins. Incidentally, a floating egg-shaped thrombus was found at the right saphenofemoral junction. Thrombus size was 14 x 7 x 6 mm, located within the clearly refluxive GSV of 9 to 16 mm diameter. Due to the aspect with threatening embolism, the decision was to go for immediate treatment.
Treatment options were: 1) Surgical thrombus extraction with removal of the diseased GSV, 2) an interventional approach by thrombaspiration, anticoagulation and elective GSV closure, or 3) an endovenous one-step procedure with thrombus fixation and thermo-occlusion, for which patient and interdisciplinary conference decided.
In a first step, the SFJ was narrowed by ultrasound-monitored perivenous saline (Klein´solution), injected with a 21 G needle (120 mm) in coaxial approach. A PTFE catheter (PhleboCath®, 2.3 mm) was positioned distal to the thrombus. Using a 810 nm laser device (12 W, Medart) and a 600 micron spherical fibre, the thrombus was fixed by means of coagulation. Finally, the diseased GSV was occluded with the same laser (80-120 J/cm). The final images showed exact closure oft the GSV with laminar femoral flow. Discharge with Clexane 2 x 20 mg s.c. for 3 days, and compression stocking class II.
The postinterventional period (follow-up: 2-4-8 weeks) was asymptomatic except a minor discomfort along the treated vein, not limiting any activities and not requiring medication.
Conclusions: The reflux in the SFJ and orthograde flushing by the inferior epigastric vein seem to be the main factors of this particular thrombus formation. Surgical thrombus removal would have been the standard choice, offering reliable prevention of embolism. Interventional thrombaspiration is less safe. Furthermore, a large and phlebitic GSV may be better suitable for surgical extraction. However, the chosen strategy to fix the thrombus and then endovenously occlude the GSV is as well highly safe to prevent embolism. Furthermore, it is minimally invasive, requires just local anesthesia and allows immediate ambulation.

Ultrasound guided sclerotherapy of mayor saphenous vein aneurism

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Background: The venous aneurisms present a single duct communicated with the other vein structures. This is a non-frequent pathology, its incidence is about 3 of 100 patients and the typical sign is the venous wall three layers affection.
The diagnosis is made by Doppler ultrasound, which allows to identify localization and size of the aneurism. It's very important to make differential diagnosis and to recognize possible complications.
Female, 54 years old, teacher, family history of varicose veins. She mentioned, she has had a trauma because of a car accident five years ago.
She presents chronic venous insufficiency (CEAP 5) and she has a 1/3 superior tight tumor on her left leg.
The Doppler ultrasound informs:
-Mayor saphenous vein insufficiency
-Minor bilateral vein insufficiency
-Left aneurysm image at 1/3 superior mayor saphenous (3.01 cm x 1.96 cm)
The treatment used was foam ultrasound guided sclerotherapy with tetradecyl sodium sulfate 3%. One session per week, during three weeks.
After four month treatment, the pathology was solved.
Conclusions: Venous aneurism at saphenous vein is very infrequent. It appears incidentally during a physical exam. The elected diagnosis method is the Doppler ultrasound. The foam ultrasound guided sclerotherapy is a very effective and resolutive treatment.

A case of varicose recurrence by a popliteal fossa perforating vein, after chemical ablation of the small saphenous vein

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Background: High ligation of small saphenous vein (SSV) multiplies by 5 the risk of pathological perforator of the popliteal fossa (PFP). Moreover, in one quarter of cases of recurrences after high ligation and stripping of the SSV, one finds pathological PFP.
Thermal and chemical endovenous ablations are replacing traditional surgery in the treatment of SSV insufficiency. This clinical case shows a significant varicose recurrence, occurring quite rapidly after effective chemical ablation of SSV.
A 53-year-old woman was treated in December 2015 for SSV insufficiency (trunk diameter 7 mm). At the 10-days control there is an occlusion of the SSV over 15 cm in length.
In July 2016, there was a small, medial, supra-fascial recurrence, which seems to be a tributary of the junction.
In January 2017, the tributary is 4 mm and the reflux is actually fed by a lateral PFP (accompanying artery); the patient is reviewed for the treatment on April, 13^{d} and the perforator reaches 6 mm diameter and tributaries even more extensive.
A foam sclerotherapy treatment is performed and the control on May, 15th finds a good occlusion of the perforator and tributaries.
Conclusions: The frequency of recurrences through an anterior accessory Great Saphenous Vein (GSV) after endovenous ablation (EA) of GSV is now recognized. Although hemodynamic conditions are not quite identical (junctional recurrences for GSV, non-junctional recurrences here), it seems that PFP recurrences may be expected, more or less early, after effective EA of SSV; suppression of superficial drainage coinciding with the abnormal hemodynamic forces in the popliteal fossa result in adaptive dilatation of perforator and development of pathological reflux and varicose recurrence. Treatment by foam sclerothérapy seems effective.

Subcutaneous fluid collection after endovenous radiofrequency vein ablation of the saphenous vein: a rarely described complication

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Background: Endovenous procedures, including radiofrequency ablation (RFA), have replaced the majority of classic venous surgery techniques. Ease of use, good outcome and an early return to normal activities are just a few of their valued positives. RFA is generally accepted as a very safe procedure with rare severe complications. However, as in all surgical interventions, complications may occur. Our case report describes a very rare complication: a seroma.
36 year-old man, a healthy butcher, with positive family history of varicose veins, gradually developed a complete varicosis of long saphenous vein (LSV) with typical symptoms. Based on duplex ultrasound examination (LSV diameter 9,2-9,8mm, reflux in SFJ over 3 seconds), an RFA technique using Olympus/CELON bipolar system was indicated and performed in tumescent anesthesia. Immediate mobilization with medical grade class 2 compression stocking followed.
Control on the 3rd postoper. day showed slight palpation sensitivity over the LSV in lower thigh. 21st day after surgery a non-painful elevated resistance with 5 cm in diameter developed dorsally from the treated vein, about 12 cm above knee level. Duplex US demonstrated a subcutaneous fluid collection with surrounding hyperechogenicity. Needle aspiration of the collection allowed a complete evaluation of the clear yellowish fluid (5cc). A local compression for 10 days followed. The aspiration was then necessary to repeat twice more in the next 20 days. Finally, we succeeded with eccentric Fegan-like compression with rubber inlay. Controls after 1, 2 and 3 months without recurrence.
Conclusions: Seroma after RFITT endovenous procedures is a rare but possible complication, hematomas seem more frequent. Between 2014-2017 we performed around 1350 RFITT of saphenous veins. A seroma was observed in one case only and was easily treated with needle aspiration and compression.

Complex telangiectasias connected to asymptomatic refluxing saphenous vein: endovenous ablation followed by clacs guided by augmented reality

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Background: 55 years old female patient, asymptomatic, complaining about telangiectasias on the inner side of the right knee that wouldn't respond to sclerotherapy or laser. During the consultation (private) the need of an ultrasound scanning was exposed. She refused initially to pay but it was explained that even though she was asymptomatic, she might have a reflux that was impeding the outcome. She accepted and the ultrasound showed a continuously refluxing great saphenous vein. Patient was submitted to endovenous laser ablation with 1470nm radial fiber laser followed by phlebectomy of the tributaries. It is important to observe that this is a case of thermal ablation in an asymptomatic patient. The patient was complaining about poor quality of life due to the appearance of her legs and due to exercises and good calf pumping, she had no symptoms. This type of treatment is classified as aesthetic phlebology and at least part of it needs to be paid by the patient.
30 days after the procedure, we started to treat the remaining telangiectasias and feeder veins with CLaCS (cryo-Laser and Cryo-Sclerotherapy) guided by augmented reality. A total of three CLaCS sessions were performed. The laser used was a ND:Yag 1064nm, 6mm soitsuze, 15mseconds laser. The average fluence used was 70J/cm2 and CLaCS was performed on the telangiectasias and it causative feeder veins. Compressions stockings (compression class 1) were used in the first 10 days and the interval between CLaCS sessions was 30 days. This before and after photo shows the appearence before and after 4 months.
Conclusions: This before and after photo shows the appearance before and after 4 months. This case opens the discussion about the treatment of asymptomatic refluxing saphenous veins to improve patient's quality of life

Air embolism following sclerotherapy

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Background: This is a case report of a cerebovascular accident in a 74 year old woman following small volume foam sclerotherapy
The patient was a healthy woman with no history of migraine or neurological problems. The incident occurred in association with her seventh direct vision sclerotherapy treatment after injection of 1.1 ml of air based sclerosant foam. While still in the clinic she developed an acute left sided hemiparesis and facial droop, right gaze deviation and dysarthria. These symptoms resolved in less than one hour and her neurological exam normalized. CT scan several hours later demonstrated air in the right middle cerebral artery. Magnetic resonance imaging showed a small acute infarct in the right parietal lobe.
Conclusions: This case illustrates that very low volumes of sclerosant air foam can lead to significant neurological complications. Elderly patients may be at incresaed risk for neurological events following foam sclerotherapy and extra caution is advisable, particularly when using air based foam.

First experience for iliac vein stenting by coronary balloons in a young case of reverse May-Thurner syndrome

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Background: Leg ulcer needs to a comprehensive evaluation. In some cases, leg ulcer is not due to reflux and pathology is obstruction.
The pt is a case of 24 Y/O with cheif complaint of Rt leg ulcer since 4 years ago.
He claims; without any risk factor; developed leg edema suddenly; afterthat; with impression of Rt leg DVT had been started warfarin; but clinical result was very poor.
Finally; he discontinued anticoagulants and stocking.
We assess the pt by ultrasonography and MRV; result was very interesting: Rt ext Iliac vein stenosis (Reverse May-Thurner syndrome).
His procedure of iliac vein stenting was very difficult: totally obstruction of Rt Ext. Iliac vein; for first time, we used coronary wires and balloons for iliac vein stenting with excellent result.
Conclusions: Iliac vein stenting can result in wound healing.

Case presentation of mismanaged EVLA and what went wrong

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Background: though EVLA is a very known technique and it has been performed all around the world but mistakes and mismanagements are very regular and unfortunately, is not presented and reported adequately.

Patient attended the same clinic with venous insufficiency and underwent bilateral EVLA of GSV under LA.
After the procedure, his complains has increased and larger varicose veins started to appear on both legs.
Patient returned for second opinion, by examining his file and US findings such discrepancies were observed; Stocking prescribed 2 sizes larger; US previously performed in flat position and the findings were severe insufficiency of both GSVs. Repeating US in semi standing position findings showed both GSV were open from SFJ for around 12 cm and also from knee to ankle showing severe reflux, multiple Accessory veins and both SSV showed severe reflux with multiple varicose veins with communication to superficial veins and also perforators.
Patient underwent EVLA of Left GSV, Accessory GSV, second Accessory GSV, SSV with miniphlebectomy and EVLA of Right GSV, Accessory GSV with miniphlebectomy, followed by foam sclerotherapy under LA with one month interval.
Patient attended work next day after each procedure with complete satisfaction and full recovery.
Conclusions: To assure best operative result Ultrasound investigation is the most essential tool. Partial treatment of defected veins is not the solution.

A difficult diagnosis

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Background: A plantar thrombosis is believed to be rare, and is therefore far too rarely considered. The clinical picture is misleading, since the circumstances that trigger the condition are often complicated and appear to point to osteo-articular aetiology.
Mrs Angélique G, aged 48, had no history of thrombo-embolism, but underwent a rotator cuff operation. She was hospitalized and bed-ridden for three weeks.
Upon discharge, she felt a sharp pain in the back of her right foot. The foot then swelled up and she was unable to use it. An emergency Doppler ultrasound proved negative. The Wells score confirmed a low probability of thrombosis, so investigations were stopped and she was treated with anti-inflammatories.
The symptoms worsened, however. After 48 hours, the patient was unable to move the leg and was in great pain.
A rheumatological origin was investigated. Bone X-rays proved normal but the MRI results stated: "images of the sub-cutaneous soft tissue of the instep appear inflamed". A Doppler ultrasound concluded: "total occlusion of two plantar veins with a 10 cm extension a posterior tibial vein". Heparin treatment was prescribed. The pain lessened and she was able to use the foot in a few days. The literature will be briefly surveyed, stressing the basic reasons for the treatment, which remains non-consensual.
Conclusions: This diagnosis should be routinely considered. The Doppler ultrasound examination is the "gold standard", for exploring the venous system, avoiding mistakes and saving cost and time.

Resilient telangiectasis on the thigh: successful treatment of the feeder veins and telangiectasis with clacs guided by augmented reality

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Background: Patient 41yo, female, with no disease and 3 pregnancies complaining about telangiectasis on the legs that wouldn't respond to sclerotherapy or transdermal laser. She had no complaints about edema but described heaviness on the thigh during long days.
Ultrasound examinations showed normal saphenous veins and no relevant perforant veins. Photo-pletismography was normal too.
Patient was submitted to 2 CLaCS (Cyo-Laser and Cryo-Sclerotherapy guided by augmented reality) sessions in 2011 and reported that she could was able to expose her legs during summer. In 2012 she was submitted to 3 extra sessions. The before and after photo shows her thigh appearance prior to treatment in 2011 and when she came back for maintenance in 2014.
Conclusions: The CLaCS treatment of the telangiectasis and all veins that the augmented reality device showed led to the treatment of the resilient telangiectasis with long lasting result. There is much to be studied about the treatment of veins that are too deep for naked eye visualization and too shallow for ultrasound detection

Case Report of successful management of recurrent thromboembolism in woman with inherited thrombophilia

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Background: A 47-year-old Caucasian woman with a previous medical history of pulmonary embolism and deep vein thrombosis (DVT), two pregnancy losses and one episode of intrauterine growth retardation, was diagnosed with recurrent pulmonary embolism and DVT in 2015. She reported that, after a first episode of pulmonary embolism and DVT (2010), thrombosis prophylaxis was done using aspirin (75mg daily). Despite of anti-coagulation therapy, recurrent episode of thromboembolism was developed. For detection of inherited thrombophilia (Factor V Leiden (FVL), Prothrombin (PTH G20210A) and Methylenetetrahydrofolatereductase (MTHFR C677T) gene mutations) were used PCR analyses. By investigation was detected very rare genotype: triple heterozygous form of FVL/PTH/MTHFR mutations. After detection of second episode of thromboembolism and inherited thrombophilia, anticoagulation was initiated with NOAC (Rivaroxaban) 20 mg once a day. Till now, no any recurrent episode of thromboembolism was observed.
Conclusions: We consider necessary to prolong proper anti-coagulation therapy in the group of patients having inherited thrombophilia, especially combined forms of mutations, to prevent recurrent thrombosis and avoid complications, such as fatal thromboembolism of pulmonary artery or post-thrombotic syndrome.

Endovenous therapy for vascular malformation of a teenage with history of infantile Kasabach-Merrit syndrome

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Background: Kasabach-Merrit syndrome (KMS) is a rare condition in infant, characterized by the combination of rapidly growing vascular malformation (VM), thrombocytopenia, microangiopathic haemolytic anaemia and consumptive coagulopathy. Literature report of this syndrome were mainly on initial presentation and medical management at infant stage. Little has been published on the subsequent management of the involved VM at or after teenage.
We report a case of 19 years old male, with history of Kasabach-Merrit

syndrome at infant. He presented with a 27 cm vascular tumor in his left thigh at birth, resulting in heart failure, thrombocytopenia, consumptive coagulopathy, haemolysis, and neonatal jaundice. His medical condition was stabilized with aggressive medical treatment. MRI of the vascular tumor at that time showed extensive involvement of cutaneous and subcutaneous, with mild muscular involvement. However, there was extensive arterial-venous shunting, with feeding vessels from the Common Femoral Artery. The VM was managed conservatively in view of the complicated anatomy.
The VM persist into teenage, but with minimal symptoms initially at childhood. However, symptom of leg pain and swelling progress which warrant more aggressive treatment. Follow-up imaging with MRI, Duplex ultrasound showed mainly venous malformation with cutaneous and subcutaneous involvement only, with the arterial element regressed. The VM was treated with Endovenous Radiofrequency Ablation + Ultrasound Guided Sclerotherapy with good result.
Conclusions: For VM which progress from infant as KMS, the arterial element of the VM may regress with time. The persistent venous malformation can be treated safely with modern endovenous therapy.

When the vascular surgeon meets the urologist: hybrid treatment of a vascular malformation of the bladder

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Background: Diagnosing and treating a congenital vascular malformation (CVM) can be a real challenge. The abnormal vascular anatomy in combination with a difficult accessible location site and a minimum of treatment options, make a multidisciplinary approach mandatory.
An 11-year-old girl with no medical history was admitted at the Emergency Department of our Hospital with a hemoglobin count of 4.3 g/dl due to massive macroscopic hematuria. After extensive examinations, a large low flow vascular malformation of the bladder and uterus was diagnosed. Three treatments with cystoscopic assisted and one treatment with laparoscopic assisted injection of 1% polodocanol foam (14 ml, 16 ml, 8 ml and 10 ml) were performed to stop the acute bleeding and regress the extent of the malformation. In addition, a hyperselective endovascular embolization of the left uterine vein with 10 ml Onyx20 was done to treat the laparoscopic and cystoscopic inaccessible parts of CVM. Each therapy session was followed by 24 hours of intermittent pneumatic compression of the lower extremities to avoid postoperative complications. There was no recurrence in the next 4 years follow-up.
Conclusions: Ultrasound Guided Foam Ablation is an established treatment for low flow venous malformations. However, when the CVM is extensive and not easily accessible, out of the box treatment with combined cystoscopic and laparoscopic assisted foamablation and endovascular embolization will cool down the venous malformation in the end without invasive surgery.

Endovenous thermoablation of great saphenous vein in patient with Parkes Weber syndrome

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Background: Parkes Weber syndrome (PWS) consists of capillary, venous, lymphatic, and arteriovenous malformations (AVMs). It offers well-defined clinical presentation and evolution. The complications have high morbidity, frequently with chronic ulcers and even amputation of the affected limb. The treatment of arterial complications is often performed by embolization. There are no reports of treatment of superficial venous system by thermoablation. The objective of this study was to report a case of treatment complications in a lower limb from a PWS patient with embolization and thermoablation.
Methods: This is a case report. Results: J.J.S., a 20-year-old female, was seen in our service 2 years ago with an ulcerated lesion on the medial aspect of the left ankle. She had a previous history of orthopedic surgery, embolizations of the tibial posterior artery and AVMs, and chemical ablation of great saphenous vein (GSV) and perforate veins with polidocanol foam in left lower limb. Physical vascular examination of the affected limb showed absence of posterior tibial pulse and presence of palpable dorsalis pedis pulse. Duplex scan showed spontaneous pulsatile flow and reflux after a decompression maneuver of GSV, perforate veins and collateral varicose veins. Arteriography showed some "nidus" throughout the member, with the largest in the distal third of leg. Embolization of the AVMs in the thigh and, 2 months later, in the leg was done. It was associated with elastic compression. The leg ulcer evolved with healing, but after almost 60 days, the ulcerative lesion recurred. It was recently chosen to treat the GSV reflux with thermoablation using a 1470-nm laser with double-ring fiber and tumescent local anesthesia. The ulcer healed in less than 4 weeks and the patient has been followed by one year.
Conclusions: The treatment of GSV with thermoablation in PWS patients is easy to perform and appears to have a favorable prognosis, thereby promoting better aesthetic aspect of lesions and quality of life, but the long-term results are not yet well-defined.

The incompetent middle-thigh perforating vein treatment

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Background: Female 51, 23 BMI, complained of the presence of varicose veins on the inside of the thigh, knee, and front of the leg. CEAP: C 1,2, A, Ep, As, P, Pr, 2,17, LII 04.06.2016; VCSS: 3; Aberdeen: 12. The length of the extended great saphenous vein (GSV) segment from incompetent perforator to varicose tributaries of the thigh was about 5cm, diameter up to 6mm. The diameter of the perforating vein up to 5,5mm. The intervention was conducted: Endovenous laser ablation of the middle-thigh perforating vein with tributaries phlebectomy under local anesthesia. The operation time was 35 minutes. Technical feature: perforating vein fell into GSV perpendicular and had a tortuous course without straight sections (4-5cm) to the femoral vein. Perforating vein catheterization performed through a perpendicular puncture in the lateral GSV wall. Bare type fiber was applied. Local tumescent anesthesia - 20 mL of 0.05% solution lidocaine. The vein was treated with 1470nm laser, 7 W, manual traction with speed of 1 mm/s, Linear energy density LEED=70 J/cm. The laser is switched off short 5mm to GSV. This phase of the operation took about 4 minutes, then held phlebectomy Muller. The next day, the GSV pathological reflux wasn't detected during the functional tests. Perforator was completely obliterated.
Conclusions: Incompetent middle-thigh perforating veins are a frequent source of varicose veins formation in the great saphenous vein system without saphenofemoral reflux. Surgical ligation of these veins requires the large incision and accompanied by the less cosmetic result. The endovenous thermal ablation usually held for a secondary incompetent segment of GSV, but the residual primary incompetent perforating vein in some cases becomes a cause of recurrence. A case of successful treatment demonstrates the ability to conduct an effective antireflux endovascular procedure without GSV obliteration.

A case presentation of pulsatile varicose vein

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Background: Pulsatile varicose veins are considered to occur from tricuspid valve regurgitation or arterio- venous malformation and fistulae. Chronic venous insufficiency (CVI) with pulsatile varicose vein is rare and treated case by case. In the era of endovenous treatment for varicose vein, our experience of the treatment for CVI with pulsatile varicose vein is presented.
84 years old woman complained of heaviness, swelling, itching of left leg since one year ago. She was diagnosed of CVI with congestive heart failure, atrial fibrillation and allergy of contrast.
Left leg was classified into C2,3,4a CEAP classification with pulsatile great saphenous vein (GSV) and corona phlebactatica without deformity.
Chest X-ray, ECG and Cardiac echo showed Af, cardiomegaly with severe tricuspid and mild mitral valve regurgitation.
Venous duplex scan showed axial GSV reflux from sapheno-femoral junction (SFJ) to above ankle level. Distal pulsatile venous flow was detected in both superficial and deep veins down to middle calf level.
Treatment; First operation, endovenous ablation (1470nm Diode laser) of GSV from SFJ to middle calf level, was performed. One day after endovenous ablation, GSV above Hunter level were recanalized. Second operation, ligation of Hunter perforator and GSV at SFJ was done.
One year Follow-up; No symptom of CVI, no varicose veins, however, pulsatile distal flow in bilateral deep veins was detected.
Conclusions: The optimal treatment of CVI with pulsatile varicose veins due to tricuspid regurgitation in this case was a combination of endovenous ablation and surgical ligation.

The challenges of the difficult leg, how do i treat them?

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Background: New Zealand, a small country in the South Pacific, has a population of about 4,500,000. The Gisborne region is home to around 43,000 with over 20,000 being of Maori ethnicity.
Multiple studies have demonstrated the prevalence of varicose veins, in particular the "severe" category, is extremely high in the New Zealand Maori population.
In Gisborne varicose veins (VV) are a major medical issue in the Maori population. The venous hypertension, venous eczema, lipodermatosclerosis and ulceration are disorders that are frequently seen and affect patient's wellbeing for many years.
The combined treatment of Endovenous Laser Treatment (EVLT) and Ultrasound Guided Sclerotherapy (UGS) is effective in treating the "difficult leg". This is life changing and cost effective management compared to the old stripping and multiple avulsions.
We discuss a few difficult cases with extreme varicosity including a severely ulcerated leg with Polio, and the remarkable, life-changing recovery they made following Endovenous Laser Treatment and UGS.
Conclusions: This combined treatment proves the extraordinary value for patients affected by debilitating varicosity. These cases studies are a snapshot of the "difficult leg" in Maori and the phenomenal effect it can have on decreasing patient morbidity in New Zealand.

Can portal vein recanalization recover chronic intestinal dysfunction of extrahepatic portal vein obstruction (EHPVO)?

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Background: In this article we described a young case suffering from chronic intestinal dysfunction led by extrahepatic portal vein obstruction (EHPVO) which was not cured by portal vein recanalization.
A 22 year-old male presented for acute abdominal pain and dyspepsia for two weeks without hematochezia on Augusta 2016 and was diagnosed as EHPVO. Contrasted computed tomography (CT) revealed portal and superior mesenteric vein thrombosis with cavernous transformation. Systemic anticoagulation therapy was chosen because cavernous transformation is the relative contraindication of intraluminal catheter directed thrombolysis (CDT). His abdominal pain was relieved but still complained dyspepsia. Upper gastrointestinal series (UGI) revealed upper jejunum dysfunction with incomplete intestinal obstruction. Intestinal segmentectomy was suggested but was refused and he accepted CDT in another institute. Although portal and superior mesenteric vein were partly recanalized, the intestinal obstruction was not alleviated. An emergent enterectomy was performed because of severe hematochezia. At the site of 70 cm distal to Treitz ligament, jejunum dilated to 10cm with edematous and rigid walls. Unfortunately, the patient suffered serious systemic infection, severe thrombocytopenia and dessiminated intravascular coagulation (DIC) after enterectomy. Stool culture revealed pseudomonas aeruginosa infection which was assumed to intestinal bacterial translocation and serious malnutrition. Fortunately the infection was controlled endly.
Conclusions: If there is chronic intestinal dysfunction of EHPVO, portal vein recanalization may not be capable to recover intestinal function. Timely enterectomy may prevent intestinal bacterial translocation and serious malnutrition.

The endovascular therapy of Budd-Chiari syndrome

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Background: To explore the experience of endovascular treatment of Budd-Chiari syndrome (BCS).
Methods: Retrospectively analysis the clinical material of 345 cases of BCS. Puncture, percutaneous transluminal angioplasty (PTA) and vascular stent implant were performed, respectively. Three-dimensional digital subtraction angiography (3D-DSA) techniques were used in complex BCS cases.
Results: Four cases were failed to puncture the inferior vena cava (IVC) and then underwent veno-atrial graft shunt (N.=3) or radical resection (N.=1). Ten cases secondary thrombi in the distal of IVC lesion were performed catheter-directed thrombolysis firstly. Endovascular treatment was performed in three to fifteen days later. One case occurred IVC pericardium inner segment rupture and acute pericardial tamponade during balloon dilatation, the others were successful punctured and dilated. The pressure of IVC was decrease from 35.33±3.9cmH2O to 9.49±2.0 cmH2O ($t=43.68$, $P<0.0001$). The follow-up duration was 3 months to 46 months and mean 28.6 months. One case was found IVC stent thrombosis and performed veno-atrial graft shunt 15 months post-operatively, the others were no stent migration and hepatic venous obstruction. The pericardial tamponade case was recovery and discharged after IVC repaired. There were no pulmonary embolism and death.
Conclusions: Good late-term and mid-term effect could be acquired

during endovascular treatment of BCS. 3D-DSA techniques can help to understand the anatomic structure of IVC lesion and search optimal work angle. It is the better choice of endovascular treatment for BCS.

Endovascular management of Budd-Charri syndrome with IVC obstruction

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Background: Budd-Chiari syndrome (BCS) is defined as hepatic venous outflow obstruction at any levels from the small hepatic veins (HV) to the junction of the inferior vena cava (IVC) and the right atrium, Accurate diagnosis and treatment should be extremely important.
BCS is briefly classified as three types: pure obstruction of HVs, pure obstruction of IVC, and combined obstruction of HVs and IVC. Most often, symptoms develop slowly over a period of weeks or months.
Generally, BCS is characterized by liver enlargement, ascites, and abdominal painng. Varicose veins of both lower extremities are often accompanied with IVC total oclusion, and often were misdiagnosed with conventional varicose veins of lower extremity.
Patient: Z.S, male, 58 years old. Chief complaint: fatigue, anorexia, abdominal distension for more than 3 years and melena for 1 months. History: fatigue anorexia without obvious inducement 3 years ago, to check liver function abnormal in the local hospital, abdominal CT showed: liver cirrhosis, splenomegaly and ascites, symptoms improved after medical treatment in another local hospital, abdominal ultrasound examination showed: Budd Chiari syndrome. Diagnosis of Budd Chiari syndrome was confirmed by inferior vena cava angiography. We performed PTA of the inferior vena cava and performed embolization of the gastric coronary vein, and the patient recovered well after endovascular treatment.
Conclusions: To avoid the Budd Chiari syndrome misdiagnosed as double varicose veins of lower extremity
Endovascular therapy is the first choice in the treatment of BCS

A report of 2 complicated cases of injury of inferior vena cava (IVC)

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Here we report 2 complicated cases of injury of inferior vena cava, which were treated in our center. Case 1. A 65- years- old male patient with right kidney stones was admitted for a nephrostomy tube misguided into IVC for 20 days. After short period time of preparation, the tube was tried to withdrawn slowly under the supervision of ultrasound scanning. However, a floating thrombus was detected in the IVC, just above the renal vein. The withdrawing of tube had to be stopped. A retrievable IVC filter was deployed in the retrohepatic IVC. Then, the tube was withdrawn successfully without hemorrhage. Anticoagulation was used postoperatively. The IVC filter was retrieved 2 weeks later. Ultrasound scanning suggested that his IVC and right renal vein were normal 4 months after the procedure. Case 2. A 41-year-old female patient was admitted for severe abdominal trauma after falling for 1 day. Before his admission, a exploratory operation was performed. Severe injury of the IVC and rupture of duodenum were found. A temporary shunting of IVC was made with a thoracic draining tube. Then, the patient was transferred to our hospital. An emergency operation was carried out. However, a large- caliber- conduit was not available at that time. Two 8mm-PTFE-conduits were put side by side, and their ends were sutured to make a larger one. Then, the modified conduit was used to reconstruct IVC. Later, the duodenum was repaired, and gatsrostomy, cholecystostomy and jejunostomy were performed. The patient recovered smoothly.

A sticky situation: chylous ascites and lipiodol

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Background: Chylous ascites is a rare complication after abdominal surgeries like an abdominal aortic aneurysm (AAA) repair. It has a high morality leading to electrolyte derangement, malnutrition and infection. Fortunately enough in most cases, conservative treatment is successful and often resolves. However, in some circumstances preoperative imaging of lymph leakage and surgery may need to be considered if the course is not progressing.
We herein report a case of a 67 year old man who developed massive chylous ascites [2-4 L/day] after an open AAA repair over 7 years ago whereby conservative measures failed over two months. In most cases, these symptoms tend to develop early on in the post operative period. lipiodol and lymphangiography were utilized to control the lymph leakage with a good outcome.
Methods: We performed a literature review on the management of chylous ascites when conservative measures failed and lipiodol and lymphangiography were utilized. A series of case reports have been drawing much attention with the use of lipiodol. We monitored conservatively for 60 days with reluctance to consider surgical intervention that would involve preoperative localization and ligation of lymph channels in a gentleman not fit for surgery. We therefore utilized lipiodol once all conservative measures had failed.
Results: Lipiodol was infiltrated with lymphangiography showing a 50% decrease in output in the first week. A repeat CT scan showed inflammatory response sealing the lymphatic vessels. The daily amount of leakage continued to decrease over the fortnight being less than 200mL. Conservative measures were continued with a slow re introduction of a low fat diet and liquids.
Conclusions: In cases that are not responding to conservative measures and patients not fit for surgery, the use of lymphangiography and lipiodol is an alternative effective measure for management of chylous ascites. It has the added benefit of being diagnostic and therapeutic that are refractory to conservative approaches thereby avoiding open surgical intervention. Continued research and larger studies would be needed to obtain further conclusive assessment of its effectiveness and timely intervention.

Incidental isolated inferior vena cava aneurysm: case report and literature review

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Background: Inferior vena cava (IVC) aneurysm is a rare venous abnormality with potential clinical importance. IVC aneurysm could preserve potential morbidity and mortality and its diagnosis and management is of clinical interest. IVC aneurysm is classified into four types based on its anatomical location along the IVC. We present a rare case of incidental IVC aneurysm which was diagnosed and managed successfully.
We report a rare case of IVC aneurysm in a 22-year old Afghan-Iranian

male patient. The patient had a history of blunt abdominal trauma one week prior to his referral to the emergency department of our center. On his initial abdominal trauma, a complete physical examination and focused assessment with sonography for trauma (FAST) was done and the patient was discharged from the emergency department. The patient has had vague abdominal pain after his discharge. We planned an abdominopelvic computed tomography (CT) scan with oral and IV contrast. The scan illustrated an IVC saccular aneurysm originating from right side of the IVC below the renal veins. We assumed that the aneurysm was found incidentally and was not relevant to the patient's recent history of abdominal trauma. Magnetic resonance venography was also conducted and it also confirmed the diagnosis of a saccular type 3 IVC aneurysm. We planned open resection and repair of the aneurysm. A midline laparotomy was done and right medial visceral rotation was conducted. A partial Satinsky clamp was applied below the site of aneurysm origin on IVC and a longitudinal incision was done on the aneurysm. Then, the entire aneurysm was resected and its origin was closed with running 6.0 polypropylene sutures. The patient had well recovery after the operation and his follow-up did not reveal any morbidity.

Conclusions: IVC aneurysm is a rare clinical entity. Its diagnosis necessitates precise clinic suspicion and the management is based on anatomical presentation and associated anomalies. We discuss potential diagnostic challenges of IVC aneurysms together with its management options during this article.

POSTER PRESENTATIONS

BASIC SCIENCE RESEARCH

Endovenous laserablation of varicose veins with the 2-ring 1470nm radial fibre – First 5 year results – Primary publication

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Background: Endovenous thermal ablation of varicose truncal veins has become a common treatment option. Radiofrequency devices underwent only small changes since 2007, the lasertechnology changed dramatically in 2012. The used wavelength rose from 980nm to 1470nm. The delivery of the applied endovenous energy was no longer straight forward but modulated by two single rings to reach the veinwall on the shortest possible way. Thus the target of the laser energy switched from hemoglobin in the blood to the water in the veinwall.
Studies have shown, that using the 1470nm laser, is a safe procedure with high efficacy and occlusion rates up to 99,6% after two years.
The aim of this study is to deliver the first 5 year follow-up data with the focus on recurrences of varicose veins in the site of the treatment in comparison to the radiofrequency ClosureFAST-catheter.
Methods: With each method 250 veins were treated. We present the first publication of the 5 year results with the 2-ring device, for great and small saphenous vein either, in a retroperspective analysis. In 2017 the patients of the year 2012 were scanned by duplex ultrasound to look for recurrences and technical failures.
Results: Primary occlusion rates 1 week after treatment were 100%. Follow-up is still running and will be finished end of 2017.
Conclusions: We want to prove that treatment of varicose veins with the 2-ring-laser is safe and reliable.

Seven high performance features of the mosquito-inspired vibrating hypodermic needle

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Background: Sclerotherapy demands a high and sustained level of hypodermic skill. It is inherently a painful procedure. The hypodermic is today's most iconic medical device, however it still comes with inherent performance-limiting problems. The aim was to copy the mosquito's precision Vibro-technology, and hence to transform the conventional hypodermic into a "high performance" hypodermic needle.
Methods: A vibrating motor was coupled to the syringe, directing vibration laterally across the bevel's cutting edge.
Hypodermic Performance was quantified.
Results: A Force Rig measured the hypodermic's performance through synthetic skin.
a) Vibration reduced the force required to overcome the needle's 2 external performance-limiting factors: 1) Penetration Resistance by 57%; 2) Tissue Stiction by 36%.
b) After 13 consecutive skin penetrations, needle blunting had reduced the vibrating needle's performance level: down to that of a new, or unused conventional needle.
The effect of vibration on liquid flow was also quantified. The flow rate was increased by 32%. Plunger Stiction was reduced by 27%. The powerful Vibration-Induced Vortex was visualized with SloMo Video.
Conclusions: There are seven Vibration-induced benefits.
The first 3 benefits enable a more precise positioning of the hypodermic's tip inside the vein.
1) Penetration Resistance↓ - Vibro-Incisor's cutting edge saws through collagen fibres of the skin, and then the vein wall.
2) Tissue Stiction↓ - Breaking weak Electrostatic Bonds (EBs).
3) Vibration Anaesthesia - Gate Theory of Pain through the Neural Pathways.
The final 4 benefits enable a more sensitive control over the flow of the liquid through the hypodermic. This flow is in both directions - Injection and Aspiration (Flashback confirms success).
4) Viscous Drag↓ - Breaking weak EBs.
5) Plunger Stiction↓ - Breaking weak EBs.
6) Viscosity↓ - Breaking weak EBs.
7) Powerful VibroVortex - A Mechanical effect on the Flow.
Together these seven Vibration-induced benefits have all contributed towards creating a "high performance" hypodermic. This mosquito-inspired hypodermic can now deliver the very high level of precision that is essential for sclerotherapy, and with significantly less pain.

Role of oxidative stress in acute and chronic wound

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Background: Healing of wounds can be affected by many factors such as local circulation, hypoxia, infection, nutritional conditions, immunosuppression or metabolic dysregulation with special regard to diabetes. Redox dysregulation is a common feature of many skin diseases with overproduction of reactive oxygen and nitrogen species demonstrated by virtually all cell types in the skin. We set out to characterize the redox environment in wound fluids and sera from patients suffering from venous leg ulcers (N.=16) and acute wounds (bulla fluids from second degree burns; N.=11) and diabetic ulcers (N.=3). Serum samples were also obtained from healthy volunteers (N.=7).
Methods: Oxidative homeostasis was assessed by measuring the footprints of ROS/RNS (protein carbonyls, lipid peroxidation, protein tyrosine nitration) as well as radical scavenging activity and glutathione levels. Nitrotyrosine and the DNA damage signal molecule poly(ADP-ribose) was detected in tissue sections.
Results: Radical scavenging activity and glutathione contents were elevated in both chronic and diabetic wound fluids as compared to acute wounds. Moreover, significantly elevated concentrations of TNFalpha, interleukine-8 and vascular endothelial growth factor were found in chronic wounds compared to acute ones while lactate dehydrogenase levels (measure of cell damage) were not different. Correlation analysis revealed significant correlation between lipid peroxidation and protein carbonylation (in sera of chronic wound patients) and radical scaveng-

ing activity and glutathione content (in wound fluids of chronic wound patients). As for the sera from acute wounds, correlation was significant between lipid peroxidation and glutathione levels and negative correlation was found between tyrosine nitration and radical scavenging activity.
Conclusions: Our data identify multiple signs of redox dysregulation in both acute and chronic wounds with notable differences. In chronic wounds elevations of antioxidant levels/activities may indicate compensatory mechanisms while correlation analysis revealed parallel changes or causal relationships between parameters.
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The surgical correction of venous trophic ulcers of lower limbs

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Background: To study the effectiveness of shave therapy and endoscopic fasciotomy in the complex treatment of patients with persistent refractory venous trophic ulcers and chronic venous compartment syndrome.
Methods: 105 patients of the C6 class were examined and combined. The average age is 62.4±7.1 years. Women predominated - 67 (63.8%). The duration of trophic ulcers is 6.7±1.6 years. A phlebectomy (crossectomy, short stripping on the thigh) was performed (N.=105). In group I of patients (N.=35) free autodermoplasty of trophic ulcers was performed with a split perforated flap. Patients of Group I (N.=36) before autologermoplasty performed layered dermatolyptomy. Group II patients (N.=34) underwent SEPS in combination with fasciotomy, shave therapy and autodermoplasty. The evaluation of the long-term results of treatment was carried out within a period of 1 to 12 months.
Results: The time of complete epithelialization of ulcers in I was 49,4±7,2 days, in group II 31,4±4,7 days, in group III 32,1±3,6 days. In 7 patients (19,4%) patients of the I group, complete engraftment of the autodermotransplant, in group II in 27 (77,1%), in group III (in 27 (79,4%) patients. In group I partial necrosis (67,1±10,5 cm2) of the graft in 29 (80,6%), in 3 (8,3%) the absence of complete epithelialization.
Conclusions: Layered dermatolipectomy with autodermoplasty with a perforated flap and surgical correction of venous hemodynamic disorders is an effective method of treatment of persistent refractory venous trophic ulcers of the lower extremities.

CASES AND CLINICAL PUZZLES

The successful case of using CT-angiography in patient with occlusion of the femoral vein and incompetent great saphenous vein

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Background: Patient N came to the clinic with lower limb ulcers on the lateral and medial ankle. Ultrasound showed us pathological reflux in the popliteal vein (about 6 seconds) and in the great saphenous vein from preterminal valve (about 3,5 seconds). The imagination of the femoral vein was rather difficult. That is why, we did CT-angiography of the leg veins with injection of the contrast solution from the veins of the foot (according to J.F. Uhl method).
The CT-angiography perfectly showed us occlusion of the femoral vein and just only 2 functional little branches of the deep veins. Great saphenous vein was a strong way of the outflow. That is why we preferred keeping it. Conservative treatment was successful and the ulcers were healed.
Conclusions: CT-angiography of the leg veins with injection of the contrast solution from the veins of the foot (according to J.F. Uhl) can be effective investigation method in patients with lower extremities veins pathology.

Restricted usefulness of lymphoscintigraphy in follow-up of primary lymphoedema

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Background: Treatment of primary lymphoedema is very problematic. We present a case of 46 years old woman with lately diagnosed primary lymphoedema. After diagnosis she was treated intensively physiotherapeutically with clinical and metrical improvement. Concurrently performed lymphoscintigraphic follow-up demonstrated no evolution of disease. The diagnosis of primary lymphoedema and initiation of appropriate treatment is usually greatly delayed. In spite of continuous progress in diagnostic and therapeutic methods, we do not observe any improvement in frequency of taking primary lymphoedema into account in diagnostics. To identify the cause of edema, various imaging methods can be used.We also emphasize the role of LS as a gold standard in diagnostics of primary lymphoedema and its limited unsuitability for follow-up assessment.Key words: lymphedema, primary congenital lymphedema, rehabilitation, lymphoscintigraphy
Conclusions: For many years it has been known that LS is a gold standard in imaging and differentiation of various causes of oedema. In our patient LS images were typical for primary lymphoedema and did not cause any diagnostic problems for the radiologist, LS was performed several times, at the beginning and during the therapy, but gave nearly identical results. In spite of the lack of scintigraphic improvement in the course of intensive therapy, metric measurements of affected limb were significantly reduced, the patients subjectively felt much better, limb mobility/functionality was improved considerably, and the swollen tissues were much softer. Possible cause of contrast between scintigraphic and clinical improvement is not fully clear and should be a subject of further studies and seems that an absence of lymphoscintigraphic regression of disease should not be an only indication to stop or modify physical therapy also in such advanced cases.

A perfect before and after: guess which treatment was performed?

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Background: A female patient complaining about varicose veins at the groin. A treatment was proposed. Guess what type of treatment was performed:
1) Phlebectomy
2) Foam
3) CLaCS
4) Sclerotherapy
5) None
Conclusions: No treatment was performed! The before photo is during the third trimester of pregnancy and the after photo is after the baby was born! In this case, the aesthetic lesions practically disappeared 100%

Resilient telangiectasis: diagnosis of feeder veins by phlebography in 1972

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Background: Patient complaining about one area lacking result after sclerotherapy. Because all other areas responded to sclerotherapy, and by 1972 there was no ultrasound or augmented reality, patient was submitted to a mini phlebography. Contrast was injected first in the telangiectasias and afterwards in the deep venous system. A phlebography was performed in each situation.
A pair of refluxing perforant veins connected to the group of telangiectasias were detected. Those feeding veins and perforant veins were removed/ligated respectively.
Conclusions: After the procedure, the desired outcome was achieved and the remaining telangiectasias responded to sclerotherapy. This is probably one of the first ever evidences of the relation of telangiectasias and feeding veins.

CHALLENGES AND OPPORTUNITIES FACING THE SPECIALTY

Venous operation most optimal pricing approach

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Background: Every country has its own method of payment structure; 1. Government; 2. Insurance, 3. Cash; 4. Combination.
Physician or medical facility are interested in highest financial income, payers are interested in the least. To assure a high-quality treatment with minimal recurrence. Requirements:
1) Complex operative technique,
  a) one or multiple veins laser treatment
  b) number of phlebectomy
  c) foam sclerotherapy
2) post-operative investigations
  a) Ultrasounds
  b) Photo-plethysmography
3) Wound care
4) Touch up
  a) Hematoma aspiration
  b) Foam sclerotherapy

Challenges: 1) Regular investigation and control of remaining veins at early stage assure against operation failure, residuals or complication (thrombosis) treatment.
2) Unlimited examination and multiple post-operative treatment increases the overhead cost and causes non-prognosis final procedure coast.
3) Obtaining insurance approval for every step is costly and time consuming, eventually deteriorating quality of care by late responses.
Our proposed approach is packages. Package calculation and formatting. It consists of 2 segments
1) Variable
  a) Number of treated vein by laser in one extremity
  b) Number of estimated phlebectomy (more or less than 20 incision)
  c) OT time
2) Fixed
  a) Post-operative ultrasound minimum of 3
  b) Wound dressing minimum of 2
  c) Clinical visit 3 (to avoid miss abuse extra visits are chargeable)

Prices are fixed per segments and simply add.

Conclusions: Payer guarantees a fixed amount per case no matter the outcome. Medical facility assures Hassle free fixed income no matter of patient follow-up, single approval, no discount nor complains.

COMPRESSION

Usefulness of low compression corsets in prevention of lymphoedema in patients after axillary lymphadenectomy

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Background: There is no fully effective treatment for secondary lymphedema. It typically occurs in a limb, but it can also occur in the torso, especially in breast cancer patients. The currently used compression therapy has varying efficiency, especially for primary prevention. The aim of the study is to find a response
1. compression therapy with Class 1 compression garment can prevent truncal lymphedema on the operated side.
2. the use of compression garments is purposeful and efficient in prevention and treatment of truncal lymphedema after mastectomy and additional radiotherapy.
3. the use of compression garments in reduction of pain
Methods: The study group was randomly divided into two subgroups: subgroup G (received compression corsets) and subgroup K (control) no physiotherapeutic treatment. The size of truncal lymphedema was measured using ultrasound.The patients were examined four times. The follow-up was for 7 months in total. The results were statistically analyzed. Also in both subgroups, we analyzed the reduction of pain.
Results: In both subgroups (G and K) the nonparametric Friedman ANOVA test was carried out. The ultrasonography test, performed after mastectomy with axillary lymphadenectomy, showed the occurrence of edema in all the patients of both subgroups Additionally, some selected patients in each subgroup were undergoing radiotherapy throughout the observation. The obtained results, have confirmed the positive effects of the compression garment therapy also during the radiotherapy.As many as 60% of patients wearing the compression garment showed reduction of pain in the chest and the shoulder joint on the operated side
Conclusions: class I compression corsets are an effective treatment for lymphedema, could be used for antiedematous prevention in patients who underwent removal of axillary lymph nodes and radiotherapy and also could reduce pain associated with surgical treatment of breast cancer.

Compartment pressure model of the mid-calf

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Background: To create a dynamic Compartment Pressure Model of the Mid-Calf.

Methods: 1.The Central Muscle Pressure is 20 mmHg. There is total of 20 mmHg incremental pressure increases, moving through the pressure interfaces, into the central muscle compartment; 2.Air Pressure is 760 mmHg. All Pressures are expressed as Absolute Pressures, where outer space is Zero, and then increasing through our atmosphere down to a sea level value of 760 mmHg; 3. Hydrostatic Pressure at the mid-calf is 80 mmHg, for a standing 1.80m tall man; 4. Blood Pressure: Relative Blood pressure is 120/80 mmHg. Hence the Central Arterial Pressure is a pulsatile 980/940. Laplace's Law of pressure applies to all 4 of these compartments: P=T/RAll Compartments exist in a dynamic state of Pressure Equilibrium with each other.
Results: The Pressure Model as illustrated satisfies all the above requirements.
Conclusions: This dynamic pressure model can explain the peripheral fluid shift that occurs in an airliner's flight-induced tissue depressurization of 200 mmHg. In addition, this concentric arrangement of compartments within compartments, explains the central pressure amplification phenomenon that occurs when applying a 20 mmHg compression stocking.
Description: Hydrostatic Pressure 80mmHg, Air Pressure 760mmHg, Interface Pressure 20mmHg, and Blood Pressure 120/80mmHg, all exist in a dynamic state of Pressure Equilibrium with each other.

Angiojet ultra system therapy for DVT

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Background: To investigate the clinical outcome of the percutaneous mechanical hrombectomy(PMT) combined with catheter directed thrombolytic which was the new therapeutic patter for the low xtremities deep venous thrombosis.
Methods: We collected 21 cases underwent PMT+CDT therapy and 31 cases underwent CDT alone therapy whose recovery different consequences were found out.
Results: 15 patients of the observation group obtained grade III lysis resultand in the clinical estimated system, PMT+CDT group had 18 totally recovery, 1 partial recovery and 2 inefficacy. Meanwhile, 10 patients of the CDT alone group obtained grade III lysis. In the clinical estimated system, control group had 11 totally recovery, 5 acceptable recovery, 14 partial recovery and 1 inefficacy. The difference between these groups had statistical significance.
Conclusions: PMT+CDT group had better therapeutic outcomes, shorter thrombolysis time, less urokinase and shorter hospital stay.

COSMETIC PHLEBOLOGY AND COSMETIC MEDICINE

An integrated social media approach for the phlebologist

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Background: An effective social media presence affords a venue for building and maintaining patient relationships, optimizing word of mouth exposure, profiling services and new technologies, generating disease awareness, and reinforcing brand identity. The purpose of this presentation is to demonstrate to the phlebologist how to build a successful and engaging social media campaign that connects with patients, builds a specialized community, and generates business.
Methods: To create an optimal social media presence, we evaluate a varied content mix, including blog, video, images, surveys, questions, articles, patient reviews; email and website; and timely, scheduled social media activity.
Results: A case study will be presented that demonstrates the impact of social media on the phlebologist's practice. Professional service options will also be presented.
Conclusions: With nearly 2 billion active users on Facebook alone, and an equal number on YouTube, Instagram and Twitter combined, connecting with patients requires skills of engagement, including a varied content mix, email and Website integration, and a regular social media presence that employs a patient-friendly tone. A social media presence is a valuable differentiator, especially for specialized medical practices, and success requires a strategic, integrated approach.

DEEP VEINS

Long-term outcomes of stent placement for May-Thurner syndrome

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Background: We assess the clinical results of stent placement after treatment of deep vein thrombosis (DVT) in patients who previously underwent venous stenting for May-Thurner syndrome (MTS).
Methods: We reviewed the data of 128 patients with DVT caused by MTS who were treated with stent placement from January 2005 to May 2016. We evaluated to patency of iliac vein stent, venous clinical Severe score (VCSS) after contralateral occlusion during follow-up.
Results: Among 128 iliac vein stentings, male patients were 26 and mean age is 54.3 (Range: 19-85). During follow-up (mean 46 months, Range 1-133), 5 year patency rate of iliac vein stent is about 80%. There were 21 ipsilateral stent occlusions and 10 contralateral occlusions. There were 12 post-thrombotic syndromes over VCSS 5. Factors of ipsilateral and contralateral occlusion of iliac vein after stent are coagulopathy (CI: 1.254-5.535, P<0.001) and stent deployment into IVC(CI: 1.325-7.324, P<0.001)
Conclusions: Iliac vein stenting in MTS shows good long-term result. But, accurate deployment of iliac vein stent during procedure and regular follow-up in patients with coagulopathy are necessary

Varicose vein surgery in deep vein aplasia and hypoplasia cases

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Background: Possible devascularization procedures are classic surgical or new endovascular interventions. In some cases of venous truncular defects, removal of varicose veins even in the case of a hypoplastic deep venous system is possible (Belov I). In other cases step-by-step management shuld be advised in order to reroute the venous flow from the superficial enlarged vessels to the deep veins (Belov II).
Methods: In 12 cases hypoplasia, aplasia or stenosis were present in the deep axial veins. Signs of obvious AV shunts were not found in these cases. They were selected for surgery using a new modification of the Perthes test. Instead of a rubber strip tourniquet, a tensiometer cuff was placed on the limb just below or just above the knee. The cuff was inflated to 110 mmHg and the patients were asked to walk quickly for 5 minutes. In positive cases, when deep veins were absent and superticial veins were compressed by the cuff, the limb became livid and the patient complained of strong pain within 1 or 2 minutes. In negative cases, when collateral channels in the subfascial space were sufficient in number and diameter to drain the venous blood from the leg, patients informed us that their legs fel better.
Results: In these cases dilated pathologic superficial veins were removed without any circulatory complications.
Conclusions: Subfascial collaterals are able to maintain the venous drainage of the limb without the deep and superficial veins.

Association of hypothyroidism and chronic venous insufficiency: first approach to the problem

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Background: The prevalence of Hypothyroidism in the general population is 2%. No studies have described the relationship between Chronic Venous Insufficiency (CVI) and Hypothyroidism. We wanted to evaluate if the adults that have CVI have a higher prevalence of Hypothyroidism as compared to the general population.
Methods: From September 2016 to March 2017, a cross-sectional study was conducted at the Fundacion Santa Fe de Bogota Hospital in Bogota, Colombia in an adult group of patients who went to vascular surgery consultation. The present study obtained 350 adults in whom the diagnosis of CVI was done; they were evaluated for the possibility of Hypothyroidism by their clinical history. Other variables evaluated were BMI, age, CEAP Classification and Hypertension.
Results: From the 350 patients, 258 (74%) were women. The mean age of the study was 47±2 years old. 58 patients (16.2%) in study had hypothyroidism. 50 adults (14.2%) of the population in the study had arterial hypertension.
Conclusions: The study presents the risk factors (Age, Sex and Hypertension) that have been observed for CVI in the literature. The study shows a higher prevalence of Hypothyroidism (16%) in CVI population compared to the general population. This study shows us the possibility of an association between CVI and Hypothyroidism. Future research taking into account TSH levels and Free T3 for all patients diagnosed with CVI, will help us elucidate a better understanding of this association.

DERMATOLOGY IN PHLEBOLOGY

Detergent sclerosants effect on basophils *in vitro*

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Background: STS (sodium tetradecyl sulphate) and POL (polidocanol) are widely used in the treatment of lower limb veins and telangiectatic matting. The precise effect of detergent sclerosants STS and POL on basophil cell activation and histamine release is unknown. We aimed to investigate the effect of detergent sclerosants on basophil activation and histamine release *in vitro.*
Methods: Basophil cell lines were incubated with varying concentrations (0.0375% - 0.6%) of detergent sclerosants STS and POL *in vitro*. Expression of basophil cell activation markers CD63 and CD203c were measured using flow cytometry. Histamine release was measured using enzyme-linked immunosorbent assay (ELISA).
Results: CD63 expression had a significant increase with STS at concentrations 0.15% and 0.3%. CD203c expression remained the same at all STS concentrations. POL had no effect on basophil cell activation at all concentrations. Histamine release was not found to be significant in the ELISA experiments.
Conclusions: CD63 and CD203c are markers of basophil cell activation. STS had a greater effect on basophil cell activation than POL. POL is a weaker sclerosing agent than STS in clinical settings. CD63 and CD203c expression in STS and POL concentration 0.6% was the lowest. This is largely due to increased cell lysis that high sclerosant concentrations induce. Both STS and POL had no significant effect on histamine release *in vitro*. We aim to use the results of the *in vitro* experiments to determine the distinctive effect of detergent sclerosants in clinical settings.

Investigating patterns of venous incompetence in restless leg syndrome

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Background: To discover whether Restless Leg syndrome (RLS) is due to venous incompetence and whether treating this incompetence will alleviate RLS.
Methods: A Retrospective audit of 300 medical records of patients presenting to Sydney Skin and Vein Clinic (SSVC) for investigation of venous incompetence. This included patient medical records and ultrasound files. Data and statistical analysis was carried out. Patient medical records including CEAP Classification, venous incompetence mapping and patient demographics were assessed.
Results: The incidence of Restless Legs syndrome within the population studied was found to be 38.0%. Results for ultrasound venous incompetence studies and CEAP classifications will be shown.
Conclusions: The incidence of RLS for this patient population was higher than previously reported studies of the general population.

Leg ulcer skin graft in outpatients

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Background: Skin graft is one of the most effective treatments of leg ulcers. It is generally carried out during a short hospital stay. The aim of this study is to evaluate the tolerance and efficacy of skin grafts performed in an outpatient setting.
Methods: Between January 2016 and June 2017, 74 skin grafts were performed in 60 ambulatory patients. The main indications were either delayed healing or a very painful wound. The grafts were performed under local anaesthesia in a dedicated room by nurses graduated in wound and healing or in training.
Patients were reviewed at 5 days for the first dressing. The following dressings are performed by the patient's usual nurse
Results: There was no complication of treatment. No bleeding or infection of the Area of skin sampling. The graft generally had a very good analgesic effect. It allowed the wound to be closed immediately in a limited number of cases, but generally shortened the healing time.
Conclusions: Even if patients are different from those requiring hospitalization, leg ulcer skin grafting is a well-tolerated treatment that must find its place in the treatment of this disabling pathology.

EXTRACRANIAL AND CEREBRAL VENOUS DISEASE

The prevalence of risk factors for venosus stroke among the adult population of the city of Ulyanovsk, Russia

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Background: An actual problem of modern angioneurology is the development of effective preventive programs, aimed at reducing the prevalence of cerebrovascular diseases (CVD).
Methods: In the outpatient clinic of the city of Ulyanovsk, surveyed 318 (126 men and 192 women), ages 20-70 years. All examined patients were divided into 2 groups: group A – up to 40 years (114 persons(35,8%)); group B – over 40 (204 people(64,2%)). For results processing was used Microsoft Office Excel 2007 and STATISTICA 10. The significance of differences was assessed by Student's criterion (P<0.05).
Results: The most common modifiable RF CVD was unbalanced meals - 66%, the increase of BMI - 50.3%, physical inactivity - 54.4% and a stress - 54.4%. In group B revealed sugar diabetes (SD) - 13.7%, coronary artery disease - 32.3%, the atrial fibrillation (AF) - 9.3%, in group A was not of these diseases. Non-modifiable FR such as constitutional venous insufficiency (CVI) was more common than a genetic predisposition to strokes: 44% and 24.5%, respectively, P<0.05.
Conclusions: In a population dominated by modifiable FR. With increasing age the incidence of all RF. CVI is widely distributed in the population, which confirms the importance of this diseases and need for early diagnosis and prevention. The obvious, need to intensify health education work among the population to improve primary prevention of CVD.

The relationship between venous insufficiency, the value of the left ventricular ejection fraction and repeated ischemic stroke in hypertensive patients

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Background: The identification the of the risk of primary and repeated ischemic strokes (IS) depending on the condition of central and peripheral hemodynamics is a topical problem of medicine.
The aim of the study is to evaluate the influence of venous constitutional insufficiency and the left ventricular ejection fraction (LVEF) on the development of repeated ischemic stroke in hypertensive patients.
Methods: 69 patients with IS and were examined. All the patients were divided into 2 groups: the first group was made up of 36 patients with LVEF >60% (N.=36)(16 women and 20 men; mean age 57.2(6)years); the second – patient with LVEF<60% (N.=33) (15 women and 16 men; mean age 56,3(7,3) years). The criteria of venous constitutional insufficiency were the patients' complaints characteristic of this disorder type.
Results: In the first group in 33.3%(N.=12) patients repeated IS was registered, and at the same time in the second group RR of repeated IS was observed in 63,67%(21). The relative risk of developing repeated IS in patients with ejection fraction LVEF<60% was 1.9 (CI 95% - 1.11; 3.27).
Conclusions: In patients with venous insufficiency and LVEF <60% the risk of recurrent development is statistically significantly higher (than in patients with LVEF >60%), which should be taken into account in the treatment and prognosis of this group of patients.

Relations between electrophysiological parameters of the heart and venous insufficiency in patients with ischemic stroke

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Background: Cardionevrologic relations are actual problem in modern medicine. Venous insufficiency plays significant role in prognosing of hair circulation disorders.
The aim of our study was evaluation of relation between electrophysiological parameters of the heart and venous insufficiency in patients have ischemic stroke in the history.
Methods: 89 patients with ischemic stroke were examined. All patients were divided into 2 groups: 1st group patients with have venous insufficiency (N.=42) (22 male and 20 female); mean age 56.9(8.5) years; 2nd group – patients without venous insufficiency (N.=47) (24 male and 23 female); mean age 57.9(9.3) years. In all patient was executed ECG in standards 12 leads and high resolution ECG to determine corrected QT interval dispersion (QTcdn) and total QRS; RNS40; LAS40. Venous insufficiency criteria were specific symptoms, venous pathology in several localizations, disease of veins in the family.
Results: TotQRS was significant higher in patients from 1st group (156.6(48.3)) in comparison with patient 2nd group (132.7(27.1)) (P=0.022). Also, more values of QTcdn were patients with venous insufficiency - 40.8(15.2) and 23.7(11.4), P=0.038. We didn't find statistically significant differences in such parameters as RNS40, LAS40 between 1st and 2nd groups of patients.
Conclusions: Thus venous insufficiency presence is associates with significant higher values of TotQRS and QTcdn.

FLUID MECHANICS AND PHYSIOCHEMICAL PROPERTIES OF SCLEROSANT FOAMS

Making sclerosant foam: not all devices are the same

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Background: Some practitioners have difficulty with sclerosant foam reforming quickly into liquid before use in ultrasound guided foam sclerotherapy when using some brands of syringes. This is thought to be related to the silicone lubricant lining the syringes used by some manufacturers. The objective was to compare the sclerosant foam made using a range of commercially available syringes (2.5ml or 5ml) and connectors (3-way taps, straight connectors, designated foam making devices).
Methods: Liquid 3% sodium tetradecyl sulphate (STS) in one syringe was joined to a second syringe containing air via a Luer locked connector. The liquid:air ratio was 1:4 (1 part liquid to 4 parts air). The contents of the two syringes were mixed and passed between syringes twenty times. A full syringe of foam was immediately inverted and the time taken for liquid to reform was measured.
Results: As expected, silicone free syringes produced the most stable foam. Of the lubricated devices, some brands of syringe and connector combination produced significantly more stable foam than other combinations. There were some differences between 2.5ml and 5ml syringes of the same brand but this was not statistically significant.
Conclusions: When faced with STS foam reforming to liquid, using a syringe/connector combination that maximises the foam stability can be very helpful. This can be especially pertinent when direct injections are used and for the less experienced or trainee operator.

Soap bubbles, toils and troubles. 50-year evolution in the manufacture of sodium tetradecyl sulphate injection

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Background: A review of 50 years of manufacturing of Fibrovein.
The journey from an industrial active to pharma grade from start to finish.
Methods: Review will cover how the regulatory requirements have changed over the last 50 years and the implication for manufacturing sclerosants.
Results: The process has changed significantly with major implications on the cost of manufacturing and maintaining product licenses.
Conclusions: Modern sclerosants are made to exacting pharmaceutical standards and are fit for purpose in the modern era.

GENETICS

Genetic polymorphism of the hemostatic system in young and middle-aged patients with ischemic stroke and constitutional venous insufficiency

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Background: Stroke holds a leading position among the priority problems of modern neurology due to its high prevalence, high mortality rate and the degree of disability in the population.
Objectives is to analyze the contribution of genetic polymorphism of the hemostatic system in susceptibility to the development of ischemic stroke (IS) in young and middle-aged patients.
Methods: The work was done at the neurological department of the hospital. Genetic polymorphisms were determined using a kit of reagents for determining genetic polymorphisms "CardioGenetika Thrombophilia".
172 patients in the acute period of IS at the age of 25 to 60 years were examined. Among the examinees were 69 women and 103 men. The average age of the surveyed 266 patients was 58 years.
Polymorphisms in candidate genes described in the literature were selected for the study: polymorphism 20210G>A FII gene, 1691G>A FV gene, -455G>A gene FGB, -675 5G>4G gene PAI-1, 807C>T ITGA2 gene 1565T>C ITGB3 gene.
Results: Studied polymorphic variants of genes were detected in 81,4% of patients. Statistically significant differences of polymorphic variants of the following genes in patients with IS and symptoms of constitutional venous insufficiency compared to patients without symptoms was revealed: FGB gene (26,6% и 42,2%), gene FV (17,1% и 5,1%), FII gene (10,6% и 6,9%), PAI-1 gene (32,9% и 15,4%), P<0,05.
Conclusions: Genetic predisposition has a significant role in the development of ischemic stroke.

Monocyte chemoattractant protein-1 gene polymorphism rs1024611 influences the risk of primary varicose veins of lower extremities

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Background: The development of primary varicose veins (PVVs) is considered to be preceded by the pathophysiological remodelling of the venous wall causing its weakness and altered tone. Inflammatory response was shown to be up-regulated in varicose veins, although it is not clear now whether it contributes to the structural and biochemical changes in the vein wall during the disease initiation, or is responsible only for venous tissue destruction at advanced stages of chronic venous disease. In our study we analyzed the association of functional regulatory polymorphism rs1024611 in the monocyte chemoattractant protein-1 (MCP-1) gene with the risk of PVVs. MCP-1 is a key chemokine responsible for monocytes/macrophages, basophilic cells, and T-lymphocytes recruitment.
Methods: We genotyped 470 patients with PVVs, and 269 control individuals by real-time PCR allelic discrimination. Statistical analysis was performed by GenABEL statistical package.
Results: We observed the association of a high-producing rs1024611 G allele with the increased risk of PVVs in patients with C2 CEAP class (OR=1.62, 95% CI=1.13-2.33, P=0.008) and in patients with the age of PVVs onset below 30 years (OR=1.41, 95% CI=1.08-1.85, P=0.01). Our finding is in line with the previously published studies showing enhanced MCP-1 production in varicose vein tissue and in blood drawn from the site of varicose veins.
Conclusions: Our result supports the hypothesis that inflammation could be implicated in the pathogenesis of PVVs, and MCP-1 could play a role in the development of this pathology.
Experiments were supported by the Russian Science Foundation (project 14-15-00734).

Genome-wide association study identifies a suggestive locus in the complement factor B gene region associated with the risk of primary varicose veins of lower extremities

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Background: Identification of genetic factors associated with the risk of primary varicose veins (PVVs) can be helpful in elucidating molecular mechanisms underlying PVVs formation. We performed a genome-wide association study (GWAS) on the sample of ethnic Russian individuals in order to reveal genetic loci affecting the risk of this pathology.
Methods: The discovery set included 212 patients with PVVs and 240 control individuals. Genotyping was performed using HumanExome-12 v1.0 BeadChip (Illumina, USA) querying common and rare genetic markers. After the quality control procedure and exclusion of monomorphic and rare variants, 25 424 common single nucleotide polymorphisms (SNPs) we left for the analysis. Top 50 SNPs most significantly associated with PVVs were selected for further replication in the independent sample of 447 PVVs patients and 443 controls.
Results: The combined analysis of discovery and replication stages revealed a suggestive susceptibility locus in the complement factor B gene region (rs4151657) associated with PVVs with $P=3.4*10^{-5}$. This gene is located on chromosome 6 within the major histocompatibility complex class III region, which includes several genes involved in regulation of the immune reaction and inflammatory response. Since the association did not reach the Bonferroni-corrected level of $P=2*10^{-6}$, independent validation of our results by other research groups would be beneficial.
Conclusions: Identification of association signal in the complement factor B gene provides evidence that immune-related gene products could be involved in the PVVs pathogenesis. Experiments were supported by the Russian Science Foundation (project 14-15-00734).

INTERVENTIONAL RADIOLOGY

Ultrasound assisted catheter directed thrombolysis for submassive pulmonary embolism

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Background: Catheter Directed Thrombolysis is a relatively new therapy for pulmonary embolism that achieves the superior clot resolution compared to systemic thrombolysis while avoiding the high bleeding risk intrinsically associated with that therapy. In order to examine the efficacy and safety of catheter directed thrombolysis (CDT), we conducted a retrospective cohort study of patients undergoing ultrasound assisted CDT at our institution.
Methods: The charts of 30 consecutive patients who underwent CDT as treatment for pulmonary embolism at our institution were reviewed. Risk factors for bleeding during thrombolysis were noted. Indicators of right heart strain on computed tomography and echocardiogram, as well as degree of pulmonary vascular obstruction, were recorded before and after CDT. Thirty-day mortality and occurrence of bleeding events were recorded.
Results: Nine (30%) patients had three or more minor contraindications to thrombolysis and fourteen (47%) had had major surgery in the month prior to CDT. Right ventricular systolic pressure and vascular obstruction decreased significantly after CDT. There was a significant decrease in the proportion of patients with right ventricular dilation or hypokinesis. Decrease in pulmonary vascular obstruction was associated with nadir of fibrinogen level. No patients experienced major or moderate bleeding attributed to CDT.
Conclusions: CDT is an effective therapy in rapidly alleviating the right heart strain that is associated with increased mortality and long term morbidity in patients with pulmonary embolism with minimal bleeding risk. CDT is a safe alternative to systemic thrombolysis in patients with risk factors for bleeding such as prior surgery. Future studies should examine the safety of CDT in patients with contraindications to systemic thrombolysis.

Transradial approach for hemodialysis access intervention

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Background: Perianastomotic stenosis is a common scenario after creation of arteriovenous fistula for hemodialysis. Many of the interventionist prefer transvenous approach. But transradial approach can easily visualize radial artery and cephalic venous tree up to central vein.
Methods: This is a retrospective study performed between November 2012 to January 2017 in Ibn Sina Hospital, Dhaka, Bangladesh. Ethical permission was taken from institutional ethical committee. Total number of patients undergoing hemodialysis access was 148 (male 74, female 74, male-female ratio 1:1). Number of radiocephalic fistula was 95 (64%), brachiocephalic fistula 50 (34%) & others 3 (2%). Most of the punctures were done by palpation. Sometimes puncture was made by Ultrasonogram guidance. Puncture needle size was 21 gauge, 4cm or 2.5cm long needle. Sheath size was 6 F x 4 cm or 7 F x 4cm.
Results: We approached 140 (97%) cases successfully through retrograde transradial approach. 8 (3%) cases were approached through retrograde venous approach because of thrombosis of radial artery due to previous intervention or creation of radiocephalic fistula in an end to end fashion.
Conclusions: Retrograde radial arterial approach to dilate perianastomotic stenosis as well as outflow vein is a good option.

LEG ULCERS AND WOUND CARE

Mid-and-long term results of subfascial endoscopic perforator surgery in Japan

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Background: To clarify the clinical results of subfascial endoscopic perforator surgery (SEPS) supported by Japanese national insurance after April 2014, which has been performed in the 21st century in Japan.
Methods: This study included 1287 limbs of 1091 patients who underwent SEPS in 14 facilities. In each limb, the venous clinical severity score (VCSS) was calculated before and 6 to 12 months after surgery. The ulcer healing rate and ulcer recurrence rate were calculated cumulatively. The clinical status of each limb was divided into 351 C6s, 72 C5s, 358 C4bs, 201 C4as, 40 C3s, and 265 C2s. Simultaneous saphenous vein treatment was performed in 1079 limbs (83.8%), and 118 limbs (9.2%) had deep venous lesions.
Results: Preoperative VCSS was significantly decreased from 10.0±6.6 to 3.1±3.4 (P<.0001) postoperatively, it was similarly decreased from 17.4±5.3 to 5.5±4.1 (P<.0001) in C6 limbs and from 11.8±6.4 to 4.7±4.4 (P<.0001) in limbs without simultaneous saphenous vein ablation. The primary ulcer healing rate was 96.2% (332 / 345 C6 limbs), and the ulcer recurrence rate was 12.0% (49 / 393 C5, C6 limbs) at the average follow-up period of 46.0 months after the ulcer healed. Recurrent ulcers were followed-up in 38 limbs, and secondary ulcer healing was obtained in 20 limbs (52.6%).
Conclusions: SEPS is an important new alternative within the Japanese medical system for treating incompetent perforating veins in patients with severe skin lesion.

Metabolic profiling reveals changes in serum, urine and ulcer fluid of patients with chronic venous ulceration

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Background: Chronic venous ulceration (CVU) is a condition contributing to significant physical, social and psychological morbidity in patients, representing 2% of the national healthcare budget expenditure in England (over £600 million *per annum*). Compression therapy is the main treatment in CVU, but can be painful, time consuming and presents significant recurrence rates. The identification of a single, reliable biological marker with the ability to identify non-healing ulcers has important translational applications for disease prognostication and development of therapeutic targets. The aim of this study was to identify potential biomarkers predictive of healing or failure to heal in a CVU population.
Methods: 28 patients with CVU were recruited with sequential follow-up over a twenty-week period. Untargeted metabolic profiling was performed on urine, serum and ulcer fluid samples, using liquid chromatography mass spectrometry (LC-MS) and nuclear magnetic resonance (NMR) spectroscopy.
Results: Following multivariate and univariate analysis, a differential metabolic phenotype was identified in healing compared to non-healing CVU patients. Statistically significant metabolites responsible for defining the metabolic phenotype were extracted. Subsequent metabolic pathway analysis of the assigned metabolites revealed phospholipid metabolism, sphingolipid metabolism and energy metabolism to be relevant biological pathways. Most notably, urine, serum and ulcer fluid were all adequate biofluid sources to differentiate between healing and non-healing CVU patients.
Conclusions: In summary, significantly altered metabolites and pathways were identified in serum, urine and ulcer fluid of patients with CVU, with the ability of differentiating between a "healing" and "non-healing" phenotype. This has important translational applications with respect to prognostication and development of targeted therapies.

Early ablation of reflux in patients with ulcus cruris venosum

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Background: The authors in presentation point out early surgical approach in patients with ulcus cruris venousum caused by insufficient superfitial venous system. Unfortunetely, in many patients with ulcus cruris venosum the ablation of venous reflux is recommendet very late. It is accompanied worse quality of life and increase cost of health service.
Methods: Retrospective analysis of operated patients with ulcus cruris venosum in Palas Athena. First of all we analysed the time from diagnosis to surgical intervention.
Results: From 2010 to 2015 we performed 105 intervention in insufficient superfitial venous system in patients with ulcus cruris. At the beginning we did only high ligation without stripping (16x), later we performed endovenous laser ablation (89) of stem veins with 1470 nm diode laser fy Biolitec.
Endovenous laser ablation were performed 89, high ligation of saphenous veins 16. The average time from diagnosis to operation were 37 months. We noticed 2 months as the shortest time and 123 months the furthes time from diagnosis to operation. A total of 105 patients only 13 patients had ulcus cruris less than 1 year. We did not record any complications such as infection of incision, deep vein thrombosis and pulmonary embolism.
Conclusions: We found out, that there is a long time from diagnosis ulcus cruris to ablation of venous reflux. The average time was 37 months. The surgical treatment of superfitial venous system must be the basic part of health care in patients with ulcus cruris venosum. The methods of choice are endovenous heating methods.

The zinc-coumarine bandage in venous leg ulcers. 15 years experience

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Background: To demonstrate the efficacy of the zinc-coumarin dressing healing method for lower limb ulcers, in chronic venous disease CEAP C6.
Methods: Retrospective clinical trial. January 2002 to December 2016. We studied 345 patients with lower limb ulcers CEAP C6 class, of venous, arterial and mixed origin (venous and arterial), determined by ecodoppler. As an exclusion criterion, the nonvascular origin of the ulcers was established. Men and women between 35 and 94 years of age without racial distinction.
A three-layer dressing was performed on all patients, with a primary dressing according to the condition of the wound, then a bandage of

zinc-coumarin, and finally the layers of low and high elasticity bandages.
The preliminary analysis demonstrates a rapid improvement in the wound bed and a significant decrease in the edema of the affected limb.
Results: Three hundred ten patients complete the treatment. In selected cases, foam sclerotherapy, with or without ultrasound guidance, was performed. Frequency of cures of 7, 15, 21 or 30 days. Patients experienced rapid improvement of pain and edema, with progression to granulation of the wound bed. Average wound size: 15 centimeters in diameter. Average weeks to close: 12.5.
Conclusions: The zinc-coumarin triple-bandage dressing, leads to a rapid improvement in the local condition of lower limb ulcers, regardless of their size, and leads rapidly to bed granulation, reduces edema and pain, factors that we believe indispensable for the complete wound healing.

Peripheral neuropathic pain (PNpP) in venous ulcers (VU)

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Background: PNpP is chronic pain, has multiple etiology but there is not firm evidence of its association with VU.
Objectives: 1) Primary: develop a diagnosis protocol of PNpP in VU and determine its prevalence; 2) Secondary: determine the utility: VAS,DN4,EQ5D5L and BPI.
Methods: Cohort, prospective, consecutive non-random.
Population: 75 pts leg ulcers, sample: 68 VU.
Period: 24 months
Protocolization: diagnosis, local treatment and CT in VU diagnostic of PNp P in VU.
Results: G1: 20pts 29.42%
G2: 48pts 70.58%
VAS: intensity G1: 6.2 / G2: 8.7 SS
Average duration: G1: 3.19 / G2:6.04 months SS
Prevalence of female sex in both groups
Average age: G1: 70.6/ G2: 58.6 SS
DN4 mean score: G1: 2/ G2: 6.8 SS
Precision of the items: tingling and burning pain are the most reliable symptoms
EQ5D5L
G2: highest percentage of affirmative answers, worse HRQOL
G1: Level 2 32% / G2: Level 3 37%
BIP HRQOL
G2: increased pain interference in all domains except personal relationships
Greatest interference:activity,ability to walk and work
NePiQol Greater number of affirmative answers in G2
G1: 312 *versus* G2: 450
G2: greater number of positive responses: symptoms 112 and physical 98
Conclusions: We development a diagnostic protocol. The utility of EVA,DN4,EQ5D5L and BPI was demonstrated. High prevalence of severe pain. High prevalence of PNpP. Alteration severe of HRQoL.
EQ 5D5L: higher percentages of affirmative answer and levels of severity. BIP: greatest interference:activity,ability to walk and work.
NePiQol Greater percentages of affirmative answers. Greater interference in symptoms and physical domains.
The effects of PNpP on HRQoL is not properly diagnosed, this does not allows to achieve a holistic practice.

Complex technique for leg edema reduction and control of inflammation and infection

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Background: There are multiple methods and medication for treatment of infection and inflammation thus reviving an old technique for treatment of venous ulcer seems to be as effective as new medicine with less cost and more convenience.
Methods: Patients selection with venous ulceration (C6), Cellulitis, venous edema (CEAP C3) inflammation, lipodermatosclerosis (C4).
FBC and wound Culture swab.
No antibiotic.
Cardiac and BP monitoring.
Patient bed placed in Trendelenburg position as per tolerance for one hour.
Pneumatic compression device was applied with pressure 60-80 mmHg as per tolerance for one hour.
Leg sprayed with super-oxidized solution twice and left to dray.
4 layers of dressing was applied:
- Zinc paste bandage with low elasticity
- Wool bandage
- Net tubal bandage
- Compression stocking, 23 mmHg pressure

Procedure was repeated weekly. After achieving the goal, Class II compression stocking was used.
Results: All the patient that completed the treatment course were fully healed (Ulcers were fully closed, no inflammation nor infections). 2 patients stopped the treatment after few days. With this method, we have managed to effectively control edema and its complication to reach a stage that we could address the causative factor of disease with minimal time and least cost of treatment.
Conclusions: Edema reduction and proper compression therapy is effective in symptomatic treatment of lower leg edema and its complications, thus patient compliances and comorbidities can affect the general outcome.

Following and comparing my endovenous techniques of curing venous ulcers

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Background: The correction of the venous system in case of persistent nonhealing ulcer is necessary - in any possible ways. On the one hand, the endovenous thermo-ablation interventions mean a lower stress, but they are more expensive operations. On the other hand, the method of Foam sclerotherapy proved to the a good intermediate solution as it is both efficient and cost effective.
Methods: For patients with increased risk who suffered chronic venous ulcer or pre-ulcer we used FOAM-treatment and endovenous Laser or RF ablation as an alternative to the classical surgical solution.
In the first group - 11 cases were foam treated, were treated targeting the healing of the ulcer.
In the second group 11 patients were foam treated, the goal was to prevent the ulcer.
In the third group - we used the endovenous thermo-ablation (6 laser/5 RF) in 11 cases again - to heal ulcer.
In the fourth group we used the 5 laser and 6 RF endovenous therapy for the prevention of ulcer.

We recorded the condition of the wound with photo documentation, venous-screening and Duplex examination.
Results: Following a 3 year follow-up period we can establish that all of the first 11 patients are free of ulcer – wounds healed. Two patients needed the foam treatment repeated after 1 year, and in one case endovenous laser ablation was needed again after two years. The second group shows the same results after two years – 11 patients without ulcer. The third and the fourth group after 2 years shows very good venous status without ulcer.
Conclusions: In our practice, even in the cases where otherwise surgery would have been required, we opted for foam treatment – these cases were elderly patients or patients with diabetes or cardio-pulmonic deficiency. This technique is easy to carry out – the improvement of circulation and wound healing is significant with minimum stress, and it is also cheaper than the endovascular ablation.

The role of supervise exercise training that adjunctive to compression therapy in patients with chronic venous ulcer: preliminary result

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Background: Venous leg ulcer is common among people in Thailand and deterioration of this disease can be costly and affect quality of life. The aim of this study was to elucidate the efficacy of calf muscle exercise adjunct with standard compression therapy.
Methods: A randomized controlled trial study has been conducted since March 2017 onwards at Maharaj Nakorn Chiang Mai hospital, Thailand. Outpatients with chronic venous leg ulcer were randomized to exercise group (supervised exercise and compression therapy) or non-exercise group (compression therapy alone). Wound parameters, ankle and calf muscle physical parameters, and functional ability were assessed before, during, and after the 12-week-exercise program. This study was approved by our local Ethic committee.
Results: Twelve outpatients aged >25 years completed the baseline measurements (exercise: N.=6; non-exercise: N.=6). Body mass index was higher in exercise group than non-exercise group (30.33±3.64 *vs.* 21.97±4.26 kg/m^2, P=0.005). There were no significant difference of the wound parameters, including wound maximum depth (0.09±0.12 *vs.* 0.34±0.32 cm), area (4.01±4.76 *vs.* 17.52±19.78 cm^2) and volume (0.47±0.94 *vs.* 6.14±8.46 cm^3). No significant difference observed in the physical assessments, including degree ankle range of motion (dorsiflexion = 7.50±5.97 *vs.* 8.00±5.29; plantar flexion = 30.40±6.54 *vs.* 29.50±18.98), ankle circumference (37.80±4.66 *vs.* 29.25±5.87cm), calf muscle strength (142.29±82.48 *vs.* 133.73±87.03 N), calf muscle endurance (6.40±4.39 *vs.* 3.50±7.00 times), and shuttle walking test (166.80±52.43 *vs.* 163.88±31.31 m).
Conclusions: Our preliminary investigation at baseline showed no significant difference of wound parameters, physical parameters, and functional ability. During UIP 2018 conference, the result in primary outcome (wound healing) will be discussed further.

LYMPHATIC

Do anthropometric data help to distinguish between lipoedema and adipositas?

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Background: Lipoedema is a chronic progressive disease in women of unknown cause with abnormal depositions of subcutaneous fat, leading to symmetrical disproportional enlargement of the legs, hips and sometimes of the arms. The diagnosis is made on clinical evidence of only some hard criteria, but as we know, some criteria cannot be objectified, such as pain. So there still remain doubts, in particular in cases of a mixed disease, when lipoedema is combined with adipositas, or in cases where adipose individuals pretend to suffer from lipoedema despite lacking typical signs.

Methods: A pilot-study was initiated with 42 patients reporting the typical signs and symptoms of lipoedema. In all patients a physical examination was performed including measurement of weight, height and diverse circumferences. These data were compared with measurements from matched adipose patients without lipoedema.

Results: The BMI was not likely to differ between lipoedema and adipositas. In accordance to some cardiovascular studies the cut off-value between "purely" lipoedema and relevant adipositas was arbitrarily set by a waist circumference <88 cm. 76,2% of the patients (N.=32) showed a mixture of lipoedema symptoms and combined adipositas. All of them showed a waist-height-ratio >0,55 in contrast to the lipoedema group with consistently <0,55. All adipose women had quotients >0,6. As a new quotient the underbreast-hip-ratio was created and could separate significantly between adipositas and lipoedema.

Conclusions: The waist-height-ratio, underbreast-hip-ratio and the waist circumference seem to be suitable to demask lipoedema patients from adipose ones in combination with the known lipoedema criteria, in particular during the course of dietary and sports activities in mixed population. Further studies will be needed to confirm the data.

NEW TECHNOLOGIES

Web enabled application for measurement of wound size

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Background: Measurements are key to wound management, especially for long term problems like ulcers. We hereby describe a method for measurement of ulcer size which provides consistent and comparable documentation irrespective of provider, lighting as well as device. The application features and usage methodologies have been designed to be suitable for standalone, team-sharing and tele-monitoring scenarios.
Methods: Our technique involves the following broad steps: (a) User takes image of the wound region, with a known scale placed in background; (b) The scale and wound are extracted from the image. Drawing of the wound boundary is done using Artificial Intelligence and Machine modeling tools, which minimize inter-user variability; (c) The number of pixels corresponding to this marked region are used to determine the wound area in square-mm. Our demonstration will show an example work-flow of segmentation and measurement using web-enabled tools.
Results: Tests conducted so far show that the method can extract wound boundaries and compute wound size with minimal user input.
Conclusions: We will be making this work available through an online web application accessible through any mobile device. Future enhancements include automatic focus correction of the image and fully automatic segmentation of the wound area. Our long term goal is to create an open source toolkit around wound size estimation.

Radial fiber carbonization and damage after endovenous 1470nm and 970nm laser treatment

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Background: The endovenous laser treatment (EVLT) using the radial fiber and wavelength of 970nm in comparison to 1470nm lasers has not been studied enough. This combination is important for phlebologists, who continue to use 970nm lasers.
Methods: We used a radial fiber, 970nm and 1470nm lasers "Milon" (Russia), an automatic retractor of the fiber, and tumescent anesthesia. Inclusion criteria were: CEAP class C2, the vein diameter was 5-10 mm in the middle third of the thigh and target segment length 15-20cm. Ten EVLT procedures were performed per each mode: 1470nm+5.6W+0.7mm/sec; 970nm+5.6W+0.7mm/sec. The groups did not differ significantly in the duration of the fiber exposure. The radiation power measuring at the end of fibers of both types was performed before and after EVLT.
Results: To achieve 90% statistical power with a type I error of 5%, the required sample size comprised 9 measurements per group. Ten EVLA procedures were performed per each mode (1 and 2). The mean value (median) of the power loss after EVLT was 0.6W for 1470nm laser and 3.15W for 970nm laser (U=9.0, Z=3.06, P=0.002, Mann-Whitney U-test.). The occlusion rate after 1-year follow-up was 100%. Microphotographies showed a marked damage of the bulb at the radial fiber tip after using the 970nm laser and absence of its damage after using the 1470 nm laser.
Conclusions: Radial fiber using with 970nm laser leads to the carbonization and microfractures of the glass bulb and significant radiation power loss after single EVLT procedure compared to the 1470nm wavelength. We didn't get any differences in the occlusion rate and no fiber was broken during the procedure. However, the loss of energy is a reason not to recommend this mode for obliteration for extensive, long or several veins.

Details and difficulties of radio frequency ablation on varicosis vein in lower extremity

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Background: Radio frequency ablation is one of the mini-invasive techniques to treat varicosis vein in low extremity. But there are still several details and difficulties of such procedure.
Background: 1) Puncture of GSW under guide of ultrasound is the most important process in radio frequency ablation. Spasm of GSW will lead difficulty to puncture. Methods to prevent spasm of GSW are belows: Make the waiting time of patient to operation after entering operation room as shorter as possible; Pay more attention on local anesthesia on puncture site, which includes preventing too much anesthesia solution on the wall of vein and applying tiny needle to perform anesthesia (32F). Temperature affect on the spasm of vein: maintain room temperature to about 25 centigrade and pre-warm the sterilizing solution. Trendlenburg position is capable to facilitate puncture.
2) Tumescent anesthesia is the second vital process to radio frequency. Use of pump will facilitate the process. But fast injection will cause pain. We can adjust the position of injection needle around GSW to guarantee 360°tumescent. By one time of puncture, the tumescent solution can defuse to about 10 cms long approximately in about 1 min that means it is unnecessary to puncture too much times. How to evaluate the effect of tumescent? Decreased diameter of GSW with fully surrounding solution and temperature detected by radio probe decreases from 37 to 25 centigrade.
Conclusions: Appropriate attention on details and difficulties will make radio frequency more effective and successful.

NURSING

A patient friendly method of peripheral venous canulation

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Background: Peripheral venous canulation is a very common procedure performed in clinical practice. Occlusion of venous drainage proximally facilitates canulation by making the superficial veins prominent. Pressure induced discomfort and other Tourniquet related complications are drawbacks of this manure. The objective of this study was to compare hand compression and band tourniquet as the method of superficial venous occlusion prior to canulation.
Methods: 62 patients who need intravenous antibiotics for more than 3 days for acute infective pathologies in lower limb were included in the study. Degree of pain during canulation was documented in a pain scale ranging from 01 to 10. Initial canulation and subsequent canulation after three days were done alternatively on right and left hands using hand compressing or band tourniquet.
Equal number of patients had initial canulation in right hand followed my second canulation in left hand and initial canulation in lest hand followed by second canulation in rights hand. Equal number of patients had initial canulation with hand compression followed buy second canulation using bad tourniquet and initial canulation using band tourniquet followed by second canulation with hand compression.
Results: 28 males and 34 females had cellulitis, infected wound and abscesses. They had no obvious difference of sensory perception in right and left hands.
Hand compression and band tourniquet were preferred by 58% (36) and 17.7% (11) respectively. 24% had no preference.
Conclusions: Hand compression can be considered as a more patient friendly way of occluding proximal venous drainage to facilitate superficial venous canulation. All tourniquet related complication can be avoided with this method.
Explanation: Hand compression probably activate tactile and thermal sensory receptors and mask the pain as described in gate theory of pain control. It also provides adjusted pressure to occlude what is needed.

Chronic venous disease among nurses in operating room and outside operating room

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Background: Varicose vein is very common in nurse. Interestingly operating room (OR) nurses are expected to have high prevalence of varicose vein because of long standing hours in OR. We wonder whether the prevalence of varicose vein in OR nurse was higher than non OR nurses
Methods: In this cross-sectional study was performed between June 2013 and May of 2013. The study population were non OR nurses and OR nurses at Maharaj Nakorn Chiang Mai. Data was collected by questionnaire. The first section of questionnaires were about personal characteristics, risk factors and history of chronic venous disease. The second section of questionnaires were about quality of life by using ChronIc Venous Insufficiency Questionnaire-14 (CIVIQ-14). The physical examination was performed by the investigators for the varicose vein based on the clinical finding using CEAP standards (C: Clinical, E: Etiological, A: Anatomical, P: Pathophysiological). Descriptive statistics of continuous variables were presented using mean±standard. Categorized variables were presented using n percent. Differences between two groups were analyzed with Chi-square or T-test/Mann Whitney U test. This study was approved by our local Ethic committee. This study was supported by Chiang Mai University.
Results: A total of 222 nurses participated were females (94.1%), aged between 41 and 50 years (37.60%), non OR nurse (55.4%) and OR nurses (44.6%). Regarding to severity of varicose vein (CEAP) in nurses, the most frequent stage was C1 (66.5%), C0 (20.8%) and C2 (12.7%). The prevalence of C0, C1. C2 was significantly different between two groups (P=0.000). The prevalence of C1 in non OR nurses and OR nurse was 72.1 and 59.6% respectively, whereas the prevalence of varicose vein (C2) in non OR nurse and OR nurse was 16.4 and 8.1% respectively. However, the quality of life was not significantly different (85.66±12.04; P=0.962) between two groups.
Conclusions: The results suggested that prevalence of varicose veins (C2) in non OR nurse seems higher than than OR nurse but the quality of life was not difference between two groups.

Survey and analysis of intravenous practice standard: a Chinese government document on intravenous administration

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Background: Intravenous catheter for medications delivery or fluid administration is one of the most important therapeutic action in patients. More than 90% inpatient patients had peripheral catheters in China. Chinese government has published the "Intravenous practice standard" to manage clinical intravenous practice and we investigated the implementation status of it.
Methods: A questionnaire survey was conducted in March, 2017. Database including disease, work age of nurse, catheter gauge, indwelling period, medication characteristics, site, flush frequency, dressing, phlebitis and complications was built with Excel software, which was described as percentage and frequency. The Statistical Package for the Social Sciences (SPSS) version 17.0 software (SPSS Ltd., Chicago, IL, USA) was used to perform all statistical analyses.
Results: Intravenous infusion rate was 76.87%, while the rate of emergency room was peaked to 96.11%; Peripheral intravenous catheter (PVC), peripherally inserted central catheter, central venous catheter, port-catheter and steel needles were widely used in the hospital. PVC was the most popular device, counting 77.91%, and 78.12% of PVC site met the standard as well as 90.17% of PICC site met the standard. There were 579 complications cases relating to intravenous treatment, 386 were drug osmosis and 111 were catheter-related blood stream infection.
Conclusions: Intravenous therapy had to be controlled legitimately and the selection of the intravenous site should be more reasonable and scientifically; Hospital and nursing management department should pay more attention to enforce the intravenous standard into practice to promote clinical health care.

The correlation analysis of self-management behavior with self-efficacy of patients with lower extremity venous disease

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Background: Investigate the relationships between patients' self-management behaviors and self-efficacy with lower extremity venous disease, and supply evidence for effective management and intervention of lower extremity venous disease for clinical medical workers.
Methods: In August 2015 to January 2016, a total of 120 cases of hospitalized patients with lower extremity venous disease of our vascular surgery department from sichuan completed questionnaires, including the General Information Questionnaire, Chronic Disease Self-management Behavior-Chinese version, Chronic Disease Self-efficacy-Chinese version.
Results: The total score of self-management behavior of patients with lower extremity venous disease ranged from 0 to 69, with an average score of 18.93±6.79, the overall level was not high. Self-efficacy score ranged from 6 to 60, with an average score of 32.25±9.65, the overall level was moderate. Self-management behavior was positively correlated with self-efficacy and its dimensions, and negatively correlated with the dimensions of communication with doctors and Common disease management.
Conclusions: The clinical staff should strengthen education and guidance of self-management behaviors in patients with lower extremity venous disease, promote the level of self-management behaviors and self-efficacy, improve the confidence of disease treatment and prevention, in order to achieve the purpose of health promotion.

Perioperative nutritional intervention in patients with varicose vein of lower extremity with diabetes

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Background: Through the implementation of perioperative nutritional intervention for patients with reasonable varicose vein of lower extremity with diabetes to help patients to establish reasonable diet, to reduce the perioperative incidence of malnutrition and standardize the clinical pathway.
Methods: To summarize 124 cases of our hospital from January 2016 to June 2017 from varicose veins of lower extremity in patients with diabetes. In addition to routine preoperative preparation before operation, nutritional risk screening NRS2002 scale was performed (score ≥3). In addition, 124 patients in this group had pure carbohydrate diet in preoperative 2 hours and can have special low residue diet in preoperative 6 hours. By eating 2 hours after blood glucose monitoring, if abnormal blood glucose is processed, different methods will be done accordingly. Postoperative patients after anesthesia can eat appetizers postoperative bedtime or liquid. On the first day after the operation, after breakfast, patient can eat high protein diabetes specific, over to the normal diet to help patients.
Results: there were no complications such as malnutrition and abnormal fluctuation of blood sugar in the 124 patients during the perioperative period.
Conclusions: Preoperative and postoperative nutritional risk screening for patients are required for the early detection and timely intervention of high-risk groups. Diet guidance, individualized nutritional intervention mode can reduce the patients with perioperative nutritional risk, standardizing clinical pathway, accelerating the rehabilitation of patients.

OTHER/MISCELLANEOUS

Management of chronic venous disease by primary health care

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Background: Chronic venous disease (CVD) is chronic disabling condition. The appropriate management of leg swelling in CVD provided by primary health care is important. To evaluate the management of edema in CVD provided by general practitioners (GPs).
Methods: The cross-sectional study involved 840 patients with the presence of the edema of the legs, diagnosed and treated by GPs during a one month period. Patients were classified according to the CEAP clinical classification into classes C3 (N.=445), C4 (N.=294), C5 (N.=78) and C6 (N.=23). Demographic and clinical data were obtained by physical examinations and standardized interviews.
Results: The management of patients included different types of treatment; venoactive drugs were recommended to 86%, lifestyle advice to 81.8% and compression therapy included bandages and stockings to 53.3% of patients. The other types of treatment such as physical therapy, topical therapy or exercises were prescribed to 9.1% patients. Dual and triple combination therapies were the most frequently recommended types of treatment. Also, 56.5% of patients were referred to a vein specialist, mostly C3 and C4 patients.
Conclusions: Although GPs had undergone a course in phlebology before they were included in the study, patients did not receive complete management of their condition such as compression and physical therapy. Continuous training of GPs and clinical guidelines for the management of CVD may help GPs to make adequate decisions.

Assessment of scrap vehicles tyres in the Northern Cyprus

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Background: Recently, the problem of used vehicle tires has become a focus in the Northern Cyprus. In this paper, the scope is to study the potential benefits of recycling scrap Vehicles tires in Northern Cyprus. Cyprus is not an industrial country and has no serious pollution problems. The coastal area is under continuous pressure from tourism, recreation, urban and infrastructure development, and to a lesser extent, agricultural and industrial development. The assessment approach performed for tires used by Northern Cyprus. They have developed a cost effective, environmentally friendly method for transforming used tyres into commercial-grade steel, oil or bio-oil, off-gases as green energy and Carbon Green. The latter of the scrap tyres are environmentally friendly replacement for carbon black required for new rubber tyre manufacture. The activity recycles 100% of these tyres into useable product to meet the EU's stringent criteria in this aspect. Unlike other processes of tyre disposal or recycling, they produce no carbon char which is deemed a hazardous waste.
Conclusions: In conclusion, the energy generated at the factory can also be reused – a true recycling activity and providing a sustainable and environmentally friendly process contributing to global targets to reduce total carbon emissions.

The pitfalls of managing a multicenter clinical trial

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Background: The management of a clinical trial in a highly regulated and complex healthcare environment can be an extremely challenging role, each stage from set up to close out associated with its own unique problems.
Methods: In the UK, the NIHR HTA programme recognise the importance of a trial manager in the successful conduct of a clinical trial. Trial managers must take a multidisciplinary approach to navigating the pitfalls encountered throughout the lifecycle of a study and have the scope and know how to develop and implement contingency plans.
Results: Once a proposal has been reviewed and funded, practical issues of implementing and maintaining trial management systems emerge. Obtaining relevant approvals, conducting feasibility and risk assessments, securing appropriate resources, navigating complex contractual agreements, negotiating budgets, conducting financial reconciliation and employing research staff are just some of the difficulties encountered before any patients are randomized. Once the trial is set up at each site focus adjusts to patient recruitment, which is inevitably more difficult than suggested in the research protocol. SUSARS, SAEs and AEs must be actively managed and the rights and wellbeing of the patients maintained.
Conclusions: Whatever the size or scope of a clinical trial the pitfalls are many and various. Issues not actively identified and managed can affect study timelines and ultimately the success of the trial. However, in the right environment with established and supportive structures almost all problems are surmountable.

Diagnosis of complex venous pathology in lower limbs with multislice TC 3D

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Background: Multislice 3D (TCM) tomography investigation of complex venous pathology in the lower limbs, evaluating the superficial and deep venous system in primary and recurrent venous insufficiency. Demonstrate its usefulness in difficult diagnosis and choice of treatment.
Methods: Analysis of two hundred CTL phlebographies performed to 100 patients with primary and complex recurrent venous insufficiency in the lower limbs within 40 months, with contrast injection in the arm and dorsum of the foot. All patients were studied with venous color echo-Doppler and evaluated prospectively and observationally considering the following variables: clinical according to stage CEAP, surgical history, diagnosis of leakage points, flow bypass circuits and re-entry points.
Results: The 3D anatomical study as a complement to color Doppler echocardiography allowed a detailed study of the complex venous pathology of the lower limbs, determining statistically greater complexity in the Poplitea fossa and the inguinal lymphogranglionar vein network.
Conclusions: The MCT is an excellent way to study the complex venous pathology of the lower limbs, especially in cases of recurrences and areas of difficult evaluation, such as the popliteal fossa and the inguinal lymphogranglionar vein network, giving more complete anatomical information and providing Hemodynamic data not available with Doppler. This study was essential for therapeutic planning in complex patients.

Use of muscle layer to stop intervertebral venous bleeding

Mahbubur Rahman

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Background: Bleeding from ay trauma like penetrating sharp cutting injury is not very much uncommon. A variety of methods of hemo-

stasis have been described, all with mixed degress of success. It has been observed that the arterial bleeding can be easily stopped, while the venous bleeding sometimes becomes very difficult to stop. In some instances it is temporarily closed by giving pressure by other things. But when the amount oof bleeding is much and cannot be acessible it becomes very difficult. In this case, we have used Trapezius muscle layer to provide tamponade effect to the accidental intervertebral venous bleeding point in our patient with severe recurrent intervertebral venous bleeding.
Conclusions: This technique was seccessful and may be considered in case of problematic hemorrhage when other techniques have failed or not applicable.

Chicken consumption on patient with varicose veins at Maharaj Nakorn Chiang Mai Hospital in Thailand

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Background: Although the risk factors determine varicose vein like female hormone intake was well established, but the nutritional association has never been investigated properly. The aim of this study was to investigate the impact of various food intake on varicose veins patients at Maharaj Nakorn Chiang Mai hospital in Thailand.
Methods: A cross-sectional study was conducted between December 2012 and November 2014. Patients at out-patient department (OPD) 101 at Maharaj Nakorn Chiang Mai hospital, Chiang Mai, Thailand, aged >18 years were invited to be concerned in this study. Patients were questioned about their demographic data, frequency of meat consumption and physical measurement for the varicose veins according to CEAP classification (C: Clinical, E: Etiological, A: Anatomical and P: Pathophysiological, respectively). This study was approved by our local Ethic committee. This study was supported by Chiang Mai University.
Results: A total of 558 eligible outpatients were recruited for the study. The most of patients were females (78.9%) and aged >50 years (47.1%). The average of body weight, height and body mass index (BMI) were 58.8±11.5 kg, 158.1±7.2 cm and 23.5±4.0, respectively. 17 patients out of 558 were diagnosed with high severity of varicose veins (C3 to C6=3.14%). We also found that the percentage of C3 to C6 was more than C0-C2 in those patients who were over 50 years old (94.1%, P=0.001), high body weight and BMI (73.8±13.9 kg and 28.8±4.4, P=0.000). About meat consumption, only chicken intake demonstrated the different association with varicose veins. Interestingly, patients with regularly consume chicken had the lower risk of varicose veins than those patients who sometimes or never consumed chicken (51.2%, 40.1% and 8.7%, P=0.022).
Conclusions: People who consumed chicken regularly may have a lower chance of advance chronic venous diseases.

TELANGIECTASIAS AND TELANGIECTATIC CONDITIONS

Microfoam for telangiectasia 5 year results

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Background: Ankle telangiectasia are varicose veins in CEAP C1-C2 classification associated with the venous insufficiency. Sclerotherapy is the treatment option for telangiectasia and spider veins in the ankle foot region. It is demanded from patient include the outcomes and from the physician part is highly demanded a good skills.The ankle–foot sclerotherapy before treat it has to be performed clinical examination USG diagnostics and usually is the sign of the venous insufficiency and venous stasis. It is very common in the elderly ages and has lots of complication at means bleeding-lip dermatosis ulcers. With this abstract we show the benefits of sclerotherapy in ankle veins from the esthetic and pathology point.
Methods: At our case in private clinic we had it of case of 100 patient treated for ankle telangiectasias C1-C2 CEAP classification with used of polidocanol doam sclerotherapy 0,5% concentration in microfoam and liquid techniques. In this abstract we show the feasibility and the technical difficulties you have to overcome to has a successful treatment.

TRAINEE PRESENTATIONS

Comparing the efficacy of Venaseal *vs.* Variclose in treatment of incompetent saphenous trunks

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Background: Cyanoacrylate is a reasonably new non thermal method to seal lower extremity superficial varicose veins. Currently there are two products available in Australia called Venaseal and Variclose. The main ingredient of both is n-butyl-2-cyanoacrylate(n-BCA).
Purpose: Venaseal and Variclose are reasonably new methods of treating varicose veins. A few centers in Australia have started utilizing this product and there are limited studies on the efficacy of them. By reviewing articles I would like to find out which product is more suitable for incompetent Saphenous Trunk treatment.
Methods: Utilizing SAGE articles and also relevant online resources such as FDA website.
Results: According to a few different articles and studies the most successful occlusion rate of treating Saphenous Trunks by Venaseal at 1 week, 1, 3, 6, 12 and 24 months were 100%, 95.3%, 100%, 98.9%, 92.9% and 94.3% respectively, and the success rate of treating Saphenous Trunks by Variclose at 1 week, 1, 3 and about 6 months were 100%, 96.7%, 96.6% and 100% respectively.
Conclusions: Based on the available studies and experience with Venaseal and Variclose the short term result in the treatment of truncal varicosities is promising. It is believed the size of the trunk is an important predictive factor of success rate with these products. Very little is known about Venaseal and Variclose and their long term efficacy. More studies are required to determine the outcome of treatment with the above products.

ULTRASOUND

Superb microvascular imaging (SMI) detects reflux in superficial veins in the skin

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Background: The presence of reflux in the microvenous network has been demonstrated using resin casting (Vincent, Jones *et al.* 2011). Our objective was to determine whether microvenous reflux could be detected in the intact limb using a novel ultrasound modality, superb microvascular imaging (SMI) compared with colour Doppler.
Methods: We recruited patients with clinical and ultrasound-detected venous insufficiency (C_{EAP} Class ≥4; limbs N.=26) and control participants with no venous disease (C_{EAP} 0; limbs N.=10). A region of skin in the medial gaiter was assessed using both SMI and colour Doppler. The presence or absence of reflux in response to foot augmentation was determined, along with the diameters and depths of responsive vessels.
Results: In patients with venous insufficiency, reflux in response to provocation was visualized in a greater average number of vessels using SMI compared with colour (range 2-26 vessels *vs.* 0-14 vessels, P<0.0001). In the control participants, reflux was only seen in one limb with SMI and none with colour. The sensitivity of SMI also appeared superior, with a smaller minimum size of refluxing vessels demonstrated (interquartile range: 0.36-0.92 mm) than with colour Doppler (0.70-1.44 mm). Of all the vessels seen to reflux with SMI, the majority were located <3 mm below the skin surface.
Conclusions: SMI is the preferred ultrasound modality to detect reflux in the microvenous circulation. It is currently being used to explore the relationship of the microvenous circulation to the progression of skin changes in chronic venous disease.

The assessment of lipodermatosclerosis using sheer wave elastography

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Background: Sheer Wave Elastography has been previously used in the assessment for liver conditions such as cirrhosis in order to stage fibrosis. There is currently no literature outlining the application and quantification of vascular conditions that involve superficial structures and their improvement using endovenous interventions.
Methods: This was a pilot study to assess the thickness of the skin, subcutaneous tissue and fat layers in conditions such as Lipodermatosclerosis. Sheer wave elastography using a Toshiba Aplio 500 Ultrasound Machine and a 10-14mHz linear array probe was performed in patients with a CEAP classification of C4b. Images of the most indurated region above the medial malleolus were obtained and a Shear Wave Ratio (SWR) obtained by comparing to an area of normal skin 1cm below the umbilicus. Four measurements were taken to assess the velocity (m/s) and stiffness (kPa) starting at just below the skin and going down vertically.
Results: The results showed that there was a significant decrease in the patient's SWR post endovenous interventions in comparison to pre-intervention, with some suggesting an increase in elasticity of 50%.
Conclusions: The SWR is an objective measure of skin elasticity in patients with C4b disease and the effect of treatment.

VASCULAR LASER THERAPY

Midterm clinical outcomes of endovenous laser ablation for the treatment of varicose veins

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Background: We evaluated the surgical outcomes, improvements in subjective and objective symptoms of varicose veins, and changes in venous function after endovenous laser ablation (EVLA) using a 980-nm diode laser.
Methods: Between October 2011 and September 2015, 704 limbs (525 patients) were treated for incompetent saphenous veins at our institution. We studied the operative complications, venous clinical severity score (VCSS), and surgical outcomes of the treated limbs. We assessed saphenous vein occlusion, endovenous heat-induced thrombus (EHIT), and deep vein thrombosis (DVT) using duplex ultrasonography and measured venous filling index (VFI) using air plethysmography, preoperatively and 1, 6, 12, 24 and 36 months postoperatively.
Results: Thirty-six months after surgery, the technical success rate (cumulative occlusion rate) was 99.2%. Although EHIT occurred in 8.4% of limbs, class 3 EHIT occurred in only 0.9%. Severe complications such as DVT and skin burns were not observed. The mean preoperative VCSS was 5.1±2.2, and this value improved to 2.1±1.1 at 1 month, 0.7±1.1 at 12 months, and 0.7±1.0 at 36 months postoperatively. The mean preoperative VFI was 6.0±3.4 mL/s, and this value improved to 2.2±1.4 mL/s at 1 month, 2.3±1.7 mL/s at 12 months, and 2.5±1.9 mL/s at 36 months postoperatively. At 36 months after EVLA, the mean VCSS and VFI values were significantly lower than the preoperative values.
Conclusions: EVLA did not cause severe complications, and good surgical outcomes were obtained. VCSS and venous function were significantly improved at 36 months postoperatively. EVLA is a safe and effective treatment for incompetent saphenous veins.

About a day surgery of varicose vein in acute care hospital

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Background: In Japan, the outpatient surgery of varicose vein is often treated with laser ablation or radio frequency ablation for health insurance coverage. On the other hand, inpatient surgery for 2-3 days has been done in acute care hospital. We have started the day surgery treatment of saphenous varicose vein in our acute care hospital, and can have very favorable outcome.
Methods: The study was limited to individuals with saphenous varicose vein who applying for day surgery (539 extremities). The patients were given an explanation of the day surgery and the leaflet that provide a treatment protocols in outpatient setting. Under general anesthesia with target-controlled infusion (TCI) and tumescent local anesthesia, the day surgery was performed using 2 ring radial fiber with 1470nm diode laser or radiofrequency catheter. After surgery, monitoring of the electrocardiogram and O2 saturation was done in the recovery room. After 2 hours, the surgical patient was examined about gait and range of motion by the anesthesiologist. If the modified post-anesthesia discharge scoring system (MPADSS) offered no difficulty, they may be allowed to send home. On 2 day and 28 day after operation, we diagnosed complication on an out-patient basis.
Results: No recanalize and complication about respiratory chain was observed in all cases. About 25% cases, Endovenous Heat-Indused Thrombus (EHIT) was found, but no case evolved to deep vein thrombosis.
Conclusions: All cases can go home the surgery day and can have the day surgery safety in our acute care hospital.

Influence of wavelengths 1470 and 1560 nm on postoperative pain after endovenous laser treatment in patients with varicose veins

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Background: Comparison of pain syndrome after performing endovenous laser treatment (EVLT) of GSV in the early postoperative period using wavelength 1470 nm and 1560 nm.
Methods: Prospective study included 380 patients (259 female) with primary varicose veins of the lower extremities. Patients age was 20-79 years (Me 43; IQR 35-54). CEAP: C2 - C5. EVLT performed by diode laser 1470 nm (N.=244) and 1560 nm (N.=136). Assessment of pain was performed according to the visual analogue scale (VAS). The follow-up was performed at 1, 3, 5, 7, 14 and 21 days after EVLT.
Results: When compared two groups (1470 nm and 1560 nm) at various times after EVLT, pain score was significantly lower in the group 1560 nm 3,3 (IQR 2,2-4,3). 1470 nm - 3,6 (2,3-5,2) P<0,04. On different days, this trend continued. In the group where the used wavelength of 1470 nm, was an increase in the level of pain on 1st day after EVLT to 9% compared to preoperative pain from 3,3 to 3,6 points (P=0,01). On day 7, pain was lower values by 30% (P<0,0001). On the 14th and 21st day the pain was significantly lower in the 1,8 and 4,1-fold respectively. In the group with the wavelength 1560 nm decreased pain syndrome since postoperative days 3 to 17% (P=0,002). The median pain score was 2,4 (IQR 0-3,4). On the 7th and 14th day pain reduced by 31 and 69%, respectively. On the 21st day of the median pain score was 0 points, IQR 0-1,6 (P<0,0001).
Conclusions: In applying the wavelength of 1470 nm was a significant increase in pain on the first postoperative day, while at the wavelength of 1560 nm is not amplified pain. A significant reduction pain in the preoperative period was in both groups: at 1470 nm from 7 days of the postoperative period, and at 1560 nm from 3 days.

Should warfarin and the other antiplatelet drugs be discontinued before endovenous laser treatment & ambulatory phlebectomy?

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Background: 1470 nm radial fiber EVLT has been shown to be a safe procedure. Our aim was to determine if warfarin and the other antiplatelet drugs should be stop before EVLT.&ambulatory phlebectomy?
Methods: Retrospective analysis on 1470nm EVLT with radial fiber patients between Jan 2016 Dec 2016.
Results: There were 2 patients in warfarin group and 99 patients in the other antiplatelets group. The mean age was 66 (32-80) years. 1470nm radial fiber Laser energy used was 6-8 Watts. And also all patients was

treated by ambulatory phlebectomy. These complications were phlebitis (1/101)and bruisings (10/101).
Conclusions: Major complications are not occur in patients who keep going warfarin & antiplatelet drug during EVLT with ambulatory phlebectomy. Warfarin & other antiplatelet drugs have been continued before EVLT are useful than stopped medication. Large prospective studies are needed to validate this finding.

EVLA how we do it in Dubai

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Background: EVLA or EVLT however we call it, is performed all around the world but complete vein treatment is a combination of methods and can be performed differently in different places, so its useful to go into more details to clarify our similarity or difference.
Methods:
Clinical visit
History
Examination
leg measurement, 20 points
Ultrasound;
semi standing
leg augmentation
every vein is examined all the way
reflux locations drawn and documented
30-45 minutes
0.5-0.9 second reflux, considered moderate
more than 1 sec-continues, considered severe.
Mild or moderate reflux
A course of medicine for 3 months
Compression garment Class II
Life style changes
Severe reflux
EVLA unilateral
LM heparin before the operation, 6 days after
LA with mild sedation decided individually
Vein puncture, fiber insertion in tilting position
Tumescent anesthesia concentration variable
number of veins
weight
sensitivity
Only defected veins and only the defected part is treated
Miniphlebectomy Varady technique, 2mm punctures, no stiches
Compression dressing and class II disposable stocking applied
24 hours; dressing removed transparent plasters applied, ultrasound control
10th day; dressing removed, ultrasound control
30th day; ultrasound control
Foam sclero therapy as touch up if required on
Operation time
24th hour
30th day post op
compression stocking is used 2-month post op
Results: 4-5 hours of hospital time. Full mobilization of patient immediately. No downtime. 0.2-0.3% recurrent in the past 7 years.
Conclusions: detailed examination, treating all the involved veins, regular control and touch ups is the key to success.

Varicose ablation: the treatment for superficial varicose veins

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Background: In our country, 1470 nm Endovenous Laser Abration (EVLA) and Radio Frequency Ablation (RFA) are recognized as methods of treatment for truncal varicose veins. And Stab Avulsion technique is popular as a method of treatment for superficial varicose veins. In our clinic, a lot of superficial varicose veins are ablated by bare-tip laser fiber since 2014. This method is called "Varicose Ablation" and has some strong points.
Methods: Varicose Ablation: First superficial varicose veins are punctured with 18G long type indwelling needle, like barbecue. And then Tumedcent Local Anesthesia is done around this needle. After that a bare-tip laser fiber replaces this needle and the veins are ablated by 810nm diode laser (Endovenous Laser Treatment DT-810, DIOTECH, Korea). 20 patients with Varicose Ablation were observed more than 6 months after the operation.
Results: No patients had complication such as skin burn or sensory nerve disorder. Their superficial varicose veins had been occluded satisfyingly in 6 months. Some patients had mild pigmentation but they were getting well as time passed. One patient had a superficial thrombophlebitis after ablation.
Conclusions: The greatest feature of Varicose Ablation is scarless. It gives delight to the patients who desire the beauty of legs. Also it is suitable for the patients with dermatitis or ulcer. The subcutaneous bleeding of this method is fewer than Stab Avulsion method. Then it is really useful for the patients taking anticoagulants.

How can the SFJ treatment be made more effective?

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Background: We evaluated for occlusion rate of a great saphenous vein (GSV) and its tributaries by ultrasound scan after varicose veins treatment with Radiofrequency Ablation (RFA). The dissection of the tributaries near SFJ has some variations, but normally, there are five divergence: superficial epigastric vein, external pudendal vein, superficial circumflex iliac vein, medial accessory saphenous vein and lateral accessory saphenous vein. It can be presumed that we can reduce the recurrence rate if the 4 tributaries are occluded except the superficial epigastric vein which flows into the center.
Methods: The purpose of this research is to reduce recurrence risk after surgery based on this evaluation results. The subject of this study is 300 treated cases (average age 65.5±11.6 years / 90 males and 210 females) using Endovenous Closure™ from May to November 2015. In all cases, the catheter tip was positioned 15mm from the SFJ. On the next day of surgery ultrasound scan was performed for evaluation.
Results: After RFA, the distance from SFJ to the occlusion was 13.8±6.8 mm on the average. The occlusion rate of main trunk of GSV was 100%. As for tributaries, the cases which the blood flow was found were regarded as positive. The cases which became occluded and which was not able to identify itself were regarded as negative. The average number of tributaries was 0.62±0.63 which the blood flow was found. The breakdown is as follows: 0:139cases/1:137cases /2:24cases /3:0cases /4:0cases.
Conclusions: The position of the tip of the catheter effective for prevention of recurrence was 15 mm.

Tumescent anaesthesia: does composition of the tumescent matters?

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Background: Thermal techniques for the treatment of the varicose veins are a standard treatment now. Tumescent anesthesia is one of the most important part of the procedure. We analyzed that most of the physicians do not completely understand the physiology of the contents of the solution and also how we can modify the content and get better results for our patients.

Methods: We took interviews of various physicians and understood that various things are being done without any scientific studies to support the practice.

Results: We try to get all the data together and try to take lectures in various scientific meeting and training programmes so that the understanding of tumescent anesthesia can be improved. One example is that cold saline is better than the room temperature saline. But there is no scientific evidence to support the usage of the said procedure.

Conclusions: Understanding of the contents and review of the literature of the very important technique is critical and it can help in modifying your practice.

VENOUS HAEMODYNAMICS AND FLUID MECHANICS

An incidence of antegrade diastolic blood flow in Giacomini's vein and the role of the overload mechanism in the development of venous disease

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Background: Antegrade diastolic blood flow (ADBF) is described as a pathological pattern of blood flow in the Giacomini's vein (GV), associated with varicose transformation and classical reflux in great saphenous vein and tributaries. There are two theories of its appearance: the theory of "siphon" which gives the main role to negative pressure gradient in varicose tributaries, and "overload" theory which means hypervolemia of GV due to blood overloading through the insufficient saphenopopliteal junction (SPJ). "Overloading" mechanism wasn't described obviously. However, apparently, it was implied by the phlebologists, who recommended high ligation or equally obliteration of SPJ for radical treatment of varicosities associated with ADBF in GV.
Methods: 514 legs of the patients, sequentially referred for the operation in 2016, were examined with duplex ultrasound. 496 legs with the recognized pattern of reflux were included in our study. We assessed the presence of ADBF in GV, GV reflux, SPJ sufficiency, SSV & GSV sufficiency.
Results: SPJ insufficiency was found in 101 (20.4%) legs. SSV reflux was found in 88(17.8%). The GV reflux was identified in 8 legs (1.6%). ADBF in GV was found in 13 (2.6%), 3 of the legs has varicose tributaries located exceptionally above the level of the saphenopopliteal junction.
Conclusions: Blood flow disturbances of the GV with clinical manifestations were present in 4.2% of legs with varicose veins (C2-C6, CEAP). The ADBF through the GV is observed in 62% of them. ADBF was strongly associated with SPJ incompetence. The location of varicose tributaries above the "escape point" of reflux (in some cases of ADBF) demonstrates the failure of the "siphon" theory, however, it consistent with the overload theory.

Common characteristics of isolated varices of the foot and role of the distal perforating: a case series

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Background: The foot varicose veins has long been neglected by the phlebologist although is often responsible for a real aesthetic discomfort. It can be sometimes even a source of thrombotic complications. Little is known about the pathophysiology of independent foot varices. We aimed to identify common clinical and ultrasound US characteristics of isolated varices of foot.
Methods: 22 feet with isolated varices were identified clinically and by ultrasound US in 12 patients free of saphenous reflux. A standardized measurement of the Djian-Annonier angle on radiography was used to quantify the foot static disorders. We performed a Duplex colour examination in all patients with the complete assessment of the superficial and deep system of the foot.
Results: None of the patients were symptomatic. However 8 patients had a cosmetic complaint. Clinical examination and radiography found Foot Static Disorders FSD in all patients. Two other common features are worth noting: The constant dilatation of the perforating vein of the first inter-metatarsal space IMS and secondarily that of the 4th IMS (3-6 mm). Interestingly, the venous flow recorded at the 1st metatarsal interspace perforating is unidirectional after toe curl, directed from the superficial to deep part. On the contrary, manual compression of the calcaneal confluent cause a bidirectional flow registered on the same perforating. In fact, when weight bearing and flexion of the first toe (during venous foot pump activity) the prevalent flow is directed into the posterior-tibial veins.
Conclusions: Previous studies suggest that the venous reservoir is located in the lateral plantar veins. When walking with FSD, the abnormal contact of lateral sole contributes to an increase in the "preload" of the plantar veins resulting in a lack of venous drainage. The redirection of flow by the singular and valvless perforating of the 1st and 4th IMS in a "dead end system" may be one of the compensatory mechanisms until creating a chronic and irreversible dilatation communicating to dorsal varices of foot. The clinical finding of isolated varices of foot should lead us to search for foot static disorders FSD.

VENOUS INTERVENTIONS

Pain assessment during radio frequency or laser thermal ablation of the great saphenous vein: a prospective multicenter study

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Background: Background: we aim to evaluate the level of pain described by patients during the local tumescent anesthesia when we practice a thermal endovenous ablation of the great saphenous vein. We tried to focus on causes influencing this pain.
Methods: Method: prospective multicenter study. We asked all consecutive patients treated for a great saphenous vein with thermal ablation between the 1st of June 2014 and the 15th of October 2014 to indicate the level of pain they felt at three different times during the local tumescent anesthesia (near the sapheno-femoral junction, in the middle of the thigh and at the medial side of the knee). All patients were treated for an endovenous thermal ablation of the great saphenous vein.
Results: the mean pain was 4.6±1.8 (range 0-10) for 96 consecutive patients. Almost 17% patients described a major pain (numeric scale between 7 and 10). Long procedures are associated with a higher level of pain (more than 30 minutes). Moreover, when the anesthesia is done in the medial side of the knee, the pain is significantly higher as well. The level of satisfaction does not vary regardless the level of pain.
Conclusions: Conclusion: even if the majority of these procedures could be realized successfully under local tumescent anesthesia only, we must find, nonetheless, anesthesia solutions for those who experience more pain.

Thermal ablation of saphenous veins: ways to make the procedure less painful

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Background: Nowadays, the gold-standard of treatment of saphenous has changed. Thermal ablation (radiofrequency and laser) has become the treatment of reference.
In most cases, local tumescent anesthesia alone is sufficient.
It is really a new manner to treat patients because with traditional surgery patients were under general or epidural anesthesia.
In contrast, local anesthesia may make people anxious because of the unfamiliar hospital environment. Furthermore, they may experience pain because of the punctures during tumescent anesthesia.
Consequently, we have to find procedures to lower stress and pain.
Methods: We reviewed in the literature procedures which have been already evaluated.
Results: Less desirable procedures: General and epidural anesthesia (no feed-back from patients). Assessed but non-efficient procedures: Lidocaïne-prilocaïne cream, various temperatures of solution (warm or cold), miscellaneous anesthetic products (bupivacaïne and ropivacaïne). Not assessed yet but appealing: hypnosis. Assessed and efficient: create a soothing ambiance (dim light, low voice, calming music, relaxing videos, breathing technics, selective vocabulary); gate control; appropriate needle; laughing gas (nitrous oyde); buffering solution with sodium bicarbonate.
Conclusions: In conclusion, the best way to lower pain and stress is probably a mix of the assessed and efficient methods adapted to each patient.

Aesthetic ambulatory surgical therapy of varicose veins of a large diameter

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Background: The aim of this paper is to present VANST (Varices' Ambulatory Non-stripping Surgical Therapy) - a particular minimally invasive surgical method of treatment of the large diameter varicose veins. This ambulatory surgical technique consists in the complete disconnection of the pathologically dilated superficial veins.
Methods: This retrospective study regards cases operated on between September 1998 - December 2016.
Only cases with varicose veins of a diameter of 40 mm or greater (observed in minimum two segments with patient in standing position) where included in the study.
Under local anesthesia through a gentle dissection the varicose veins (including saphenous trunks) and the insufficient perforators are intercepted, sectioned and ligated.
The varicose veins remain in place but they are taken out of the venous circuit and become just empty non-functional tubes.
In this manner both the venous flux and reflux are eliminated.
The patient is immediately mobilized after the operation and leaves the clinic after 30 minutes.
Results: Number of cases in the study: 648 limbs (623 patients – 166 women and 457 men).
The structure of the cases based on CEAP classification: C2-53; C3-127; C4a-224; C4b-184; C5-19; C6-41.
Postoperative closing up of the varicose veins takes place immediately in 100% of the cases.
5-year follow-up: recurrence after VANST occurs in 6.24% of the cases.
Conclusions: The surgical treatment of the varicose veins has changed! VANST is an ambulatory minimally invasive surgical procedure and an excellent alternative to stripping for treating large diameter varicose veins.

New variable cycle mode with radiofrequency segmental thermal ablation for incompetent saphenous veins

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Background: Radiofrequency segmental thermal ablation (RF) is used worldwide for incompetent saphenous vein treatment. Conventionally, one or two cycles are used for any diameter of veins; the fixed cycle (FC). On the other hand, from our phantom experiment study, we have

found that the endpoint RF power of 12W provides the optimal tissue degeneration while the cycle repetition number is less important; the variable cycle (VC). The aim of this study is to evaluate the clinical advantage of VC mode for obtaining the endpoint RF power of 12W compared with the conventional FC mode.
Methods: The VC mode in 115 limbs and the FC mode in 115 limbs are performed on a daily basis surgery. The VC mode is designed to repeat the 20-second cycle indefinitely until the endpoint power is obtained at less than 12 watts. The mean patient age was 64.2±12.9 in the VC group and 63.9±14.2 in the FC group. The number of female patients was 51 (45%) and 63 (55%) respectively. Only Five analgesic tablets were prescribed for occasional postoperative pain.
Results: The total ablation cycle number in the VC group was almost twice that of the FC group, and the maximum was 24 cycles. Occlusion rate was 100% and GSV shrinkage rate with VC seemed to become more apparent at 1 month than it was with FC. Visual analogue pain score at 1 week and 1 month in the VC group showed lower than that in the FC group, thus analgesic medication was also limited. There was no EHIT≥Class2 and the bruising appearance was the same in both groups.
Conclusions: The VC mode appeared to be more reliable, effective and safe regarding GSV shrinkage, as well as reducing the postoperative pain. Therefore, this method seems to be better for inducing effective degeneration according to heat transmission physics.

Chronic venous disease invasive treatment in the patients over 70 yrs. Is valid and clinically applicable – lesson learned

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Background: The growing life span of the population influences also on the age of the phlebological patients treated in the office and ambulatory settings. The aim of the study was an evaluation of the safety and efficacy of the invasive phlebological treatment in the patients over 70 yrs.
Methods: The group of 308 patients with chronic venous disease (class C2-C6) aged from 70 to 95 years was assessed. All the patients underwent the invasive phlebological procedures due to the chronic superficial venous disease. In the group, the following procedures were performed: EVLT-186, ultrasound guided sclerotherapy-97, tumescent assisted ultrasound guided sclerotherapy–37, sclerotherapy–62 and surgery-6. In the analysis, the treatment indications, risk factors, complications as well as clinical results were evaluated.
Results: In the assessed group, no serious adverse events and complications were recognized, however, in the elderly patients the higher EHIT rate after EVLT procedures was reported. Except 6 patients qualified to surgical treatment, all the patients underwent office based treatment without the necessity of hospitalization. Despite an advanced age, in some of the patients, the cosmetic aspect of the diseases was still valid as the main treatment indication.
Conclusions: In patients over 70 years, an invasive phlebological treatment is valid and potentially clinically applicable. An implementation of the minimal invasive technologies, including foam sclerotherapy, as well as tumescence assisted sclerotherapy and endoluminal thermal vein ablation allow to treat the elderly and fragile patient population with accepted safety and good clinical efficacy.

The changes of surgical treatment for primary varicose veins in a day surgery clinic: from stripping surgery to endovenous thermal ablation therapy

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Background: Since Japanese goverment approved endovenous thermal ablation (EVTA) for public health insurance system in 2011, EVTA has become a popular procedure because of its low invasiveness. Changes of surgical procedure for primary varicose veins and the clinical results in our day surgery clinic were evaluated.
Methods: Since May 2010, 5004 primary varicose vein patients underwent day surgery. Tumescent local anesthesia and an intravenous administration of propofol and remifentanyl were used. The surgical procedure was stripping of the incompetent saphenous veins or EVTA of those. Device for EVTA was Bioletec 980 nm diode laser with bear-tip fiber (N.=278), Bioletec 1470 nm diode laser with radial fiber (N.=1130), and ClosureFAST radiofrequency ablation system (N.=683). Miniphlebectomy was added by stab avulsion technique. Patients were followed-up on POD2, POD7, and POM1.
Results: All patients could go home within 30 minutes after the surgery. Mean operation time was 31 minutes in the stripping group and 27 minutes in EVTA group. Postoperative minor complications such as hematoma, phlebitis, dermatitis, infection, and calf DVT, were observed in 5.7% of the stripping group and 2.8% of EVTA group. However, severe complications such as pulmonary embolism, proximal type DVT, or Class 3-4 EHIT have never experienced in all of the patients. The percentage by year of EVTA was 0% in 2012, but increased to 12% in 2013, 55% in 2014, 82% in 2015, 95% in 2016, and reached to 97% in 2017. After the stripping surgery, 3 patients (0.1%) needed late reoperation because of recurrent varices. In contrast, no patients of EVTA group needed reoperation.
Conclusions: The clinical results of our day surgery for primary varicose veins seems to be acceptable. Trend of varicose vein surgery may expect to shift from stripping surgery to further low invasive procedure like as EVTA.

Three years experience in Kosova with EVA (endovenous ablation)

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Background: This prospective study evaluates the results of Endovenous ablation (EVA).There are three modalities wich are used for the treatment of varicose veins: EVLA (Laser 1470),Closure Fast (Radio-Frequency) and Clarivein
Methods: They were prospectively collected for all patients undergoing EVA for varicose veins in our clinic including clinical outcomes (CEAP classification) and post-operative duplex.
Results: 379 EVA procedures were performed from April 2014 to May 2017. 346 LSV cases, 21 SSV cases, 12 patients with AAS.17 patients were treated with EVA billateral. 96% were done under Tumescent Anestesia and 4% underwent general anesthesia. No intra-operative complications were seen, and a 0.3% incidence of DVT. During a median follow-up of 12 months there were less than <1% (3) on duplex evidence of recurrence and recannalization of the treated vein.
Conclusions: Our 3-year experience suggests that EVA are very safe and effective alternative compare to conventional surgery for the treat-

ment of varicose veins. And very hard cases with the diameter >30 mm near the safeno-femoral junction are completed successfully and very safe with Laser Ablation.

Ligature and section of the saphenopopliteal junction with (intraoperative) catheter sclerotherapy in the treatment of the small saphenous vein (a highly effective alternative)

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Background: The treatment of insufficient small saphenous vein is one of the not so common situations as the great saphenous vein for phlebologists. Ligature and section of the saphenopopliteal junction associated to sclerotherapy with (intraoperative) catheter in the small saphenous vein is a simple procedure.
Methods: Between March 2012 and February 2017, 88 patients were performed LSCS, and were followedup for 2 years with clinical checkups and Doppler ultrasound. CEAP 2-5 were included. All
procedures were outpatientbased,with brief postoperative stays.
Results: Group I: SSV occluded,: 43 patients ; Group II: SSV Partially rechanneled, without reflux: 25 patients; Group III: SSV rechanneled, 3 patients. The results were considered excellent in 68 cases. 6 patients presented with clinical recidivism, and 19 patients presented with morbidity – most of them, transient.
Conclusions: Ligature and section of the saphenopopliteal junction associated to sclerotherapy (intraoperative) with catheter at the small saphenous vein, performed together with supplemental procedures (minisurgeries) at CV and PV is, in 88.73% of cases, a simple, lowcost, and widely accepted procedure, and affords the great advantage of treating the whole varicose condition in a single procedure and with a high effectiveness (95.77%).

Association of radiofrequency ablation and surgical stripping in the treatment of the great saphenous vein in an outpatient setting for a better functional and cosmetic result

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Background: The methods of Endovenous thermal techniques are very well tolerated, but risks and side effects are nevertheless present. The association of surgical stripping to remove the superficial segment of the GVS and proximal radio frequency GSV ablation is proposed.
Methods: 52 patients who suffered from insufficiency of the great saphenous vein (GSV) with junction incompetence have been treated.
The procedure of thermal ablation was performed in an outpatient setting with a *VNUS ClosureFAST Procedure* in the deep and proximal segment of the GSV, the stripping under local anaesthesia was performed immediately after using an invagination technique in the superficial segment of the GSV.
All patients were controlled after 1 month, 6 months, 1 year and 3 years.
Results: 100% of patients had an occlusion of the GSV and the complete elimination of the reflux after 1 month. After 1 year only 3 cases out of 52 (5,8%) had a partial re-canalization and reflux of collateral varicose veins, which made a further phlebectomy intervention necessary.
The Venous Clinical Severity Score significantly improved at 3 years ($P<0.001$).
No skin damage was detected, no paresthesia was clinically reported.
Conclusions: The results show that a combined treatment of radiofrequency ablation (RFA) and Surgical Stripping (SS) brings about a more complete and definitive result and reduce the risk of skin changes and nerve injury.

Clinical outcomes and quality of life after endovenous ablation for great saphenous vein incompetence: a single center prospective nonrandomized study

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Background: To evaluate the short term outcomes with endovenous thermal ablation in patients with great saphenous vein (GSV) incompetence.
Methods: CEAP classification, CEAP clinical score, Venous Clinical Severity Score (VCSS) and Chronic Venous Insufficiency Quality-of-Life Questionnaire (CIVIQ) were recorded. Follow-up including duplex scan was performed at 1 and 12 months. Primary outcome was anatomic success defined as absence of reflux or recanalization of GSV. Secondary outcomes were complications, improvement of CEAP clinical, VCSS and CIVIQ scores. Patients in whom recanalization was demonstrated were analyzed for anticoagulant or antiplatelet usage.
Results: 70 patients (24 ♂, mean age 52 y) were included over a 16-month period. 74% of patients were classified as C2 or C3 venous disease. 54 patients underwent endovenous laser ablation (EVLA) with a 1470 nm diode laser and 16, radiofrequency ablation (RFA). Total occlusion rate was 89%, with comparable results between EVLA and RFA. Segmental (N.=5), or complete (N.=2) recanalization was seen in 7 limbs (11%) after initial successful ablation. Anticoagulation or antiplatelet agent usage did not increase the risk of recanalization ($P>0.5$). All patients showed significant ($P<.0001$) improvement of CEAP clinical, VCSS and CIVIQ scores including those with recanalization. The complication rate was low (10%) with most frequent reported a burning sensation or numbness (3 pts) followed by superficial vein thrombosis (2 pts).
Conclusions: No difference in the outcomes was found between EVLA and RFA. Improvement of clinical and quality of life scores at 1 year was observed in all patients regardless the presence of recanalization.

Retrograde transradial approach for hemodialysis access intervention

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Background: Perianastomotic stenosis is a common picture after creation of arteriovenous fistula for hemodialysis. Most of the interventionists prefer transvenous approach. But transradial approach can easily visualize radial artery and cephalic venous tree up to central vein.
Methods: This is a retrospective study performed between November 2012 to January 2017 in Ibn Sina Hospital, Dhaka, Bangladesh. Institutional ethical committee provided permission for this study. Total number of patients undergoing hemodialysis access was 148 (male 74, female 74, male-female ratio 1:1). Number of radiocephalic fistula was 95 (64%), brachiocephalic fistula 50 (34%) & others 3 (2%). Most of the punctures were done by palpation. Sometimes puncture was made

by Ultrasonogram guidance. Puncture needle size was 21 gauge, 4cm or 2.5cm long needle. Sheath size was 6 F x 4 cm or 7 F x 4cm.
Results: We approached 140 (97%) cases successfully through retrograde transradial approach. 8 (3%) cases were approached through retrograde venous approach because of thrombosis of radial artery due to previous intervention or creation of radiocephalic fistula in an end to end fashion.
Conclusions: Retrograde radial arterial approach to dilate perianastomotic stenosis as well as outflow vein is a good option.

Results of management of lesser saphenous vein (LSV) insufficiency with thermal or chemical ablation with ultrasonographic guidance in a series of Salvadorian patients

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Background: The role of LSV reflux and it 's relationship with chronic venous insufficiency has been ignored and unexplored for many years. This study aims to expose the current scenario of the role of LSV insufficiency in the clinical condition of patients in El Salvador, observe therapeutic approaches and the time tracking to identify the evolution of the pathology. Objective:To evaluate the clinical cases of patients with venous insufficiency of the saphenous vein treated with thermal or chemical ablation in the Varicentro Clinic.
Background: The role of lesser saphenous vein reflux and it 's relationship with chronic venous insufficiency has been ignored and unexplored for many years. This study aims to expose the current scenario of the role of lesser saphenous vein insufficiency in the clinical condition of patients in El Salvador, in addition to the available therapeutic approaches and the time tracking to identify the evolution of the pathology. Background: To evaluate the clinical cases of patients with venous insufficiency of the saphenous vein treated with thermal or chemical ablation in the Varicentro El Salvador Clinic.
Methods: Retrospective longitudinal study, observational type.
Results: A total of 48 members were studied.The mean age was 57.4 years, with a standard deviation of 13.3 years, a median age of 57 years and a 69 year mode. The most frequent anatomic patterns were types A and B, both with a 35.4% representativeness, and in 54.2% the saphenous vein was found to be smaller in relation to the interauricular line above the popliteal void. 63.3% of the population was overweight or obese. A 48.8% of members had criteria for classifying them with chronic venous insufficiency.
Conclusions: The total occlusion of the treated veins at the observation period was 91.6% in the thermal ablation and 66.6% in the chemical ablation. Partial occlusion was observed in the remaining veins. There was a statistically significant decrease in the mean diameter of 2.2 cm at the ankle level, 1.22 cm at the middle third level and 1.19 cm at the upper third level (P<0.0001). The complications of the reported treatments are more frequent if the ablation treatment adds complementary treatments.

Implementation of propofol sedation combined with tumescent anesthesia in varicose vein treatment

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Background: The most significant problem of tumescent anesthesia is that it requires multiple injections of tumescent solution, and is therefore very painful. Some hospitals use propofol, a sedation anesthetic, during varicose vein surgery to reduce such pain. The aim of this study was to examine the effectiveness and safety of propofol sedation combined with tumescent anesthesia when performing endovenous laser ablation and phlebectomy.
Methods: Between January 1st and December 31st 2016, 428 patients underwent endovenous laser ablation and/or phlebectomy. All 428 patients were treated with propofol sedation and tumescent anesthesia. Each patient's blood pressure, heart rate, electrocardiography and pulse oximetry were monitored throughout the operation, and O_2 was applied nasally. Prior to tumescent solution infiltration, each patient was injected with propofol at intermittent intervals. The patient's age, body weight, physical activity, and whether the patient was taking any medication were considered when deciding the amount of and time interval between each dosage of propofol.
Results: All the patients slept well, and upon waking could not recall having felt any pain throughout the operation. Because they did not feel anxious, the patients' blood pressures remained within normal range during their sleep. Not only was it beneficial for the patients, this method of treatment was also convenient for the doctors performing the surgery. Some patients needed the chin lift technique, but their O_2 saturation levels recovered within a few seconds. Only one patient required insertion of a plastic airway into her mouth. None of the patients needed endotracheal intubation or laryngeal masks.
Conclusions: This study shows that intravenous sedation using propofol is effective and safe when used with tumescent anesthesia during varicose vein treatment. However, adequate patient monitoring is mandatory. The results of this study should be confirmed in a large experimental study.

VENOUS INTERVENTIONS: SCLEROTHERAPY

Day surgery for varicose veins of lower extremity in China

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Objectives: to discuss the feasibility and safety of day surgery for lower extremity varicose veins in China.
Methods: From December 2015 to December 2017, 1100 patients with varicose veins of lower extremity were treated with radiofrequency ablation combined with sclerotherapy in day surgery model. The rates of vein closure, complications and recurrence rates of these patients were followed-up.
Results: All patients underwent surgical treatment safely. There were no major complications during the follow-up.
Conclusions: Despite the lack of family physician support, standardized technical practices and strict follow-up systems ensure safe and effective of the lower extremity varicose vein day surgery.

Ultrasound guided foam sclerotherapy 3 years follow-up results from Paraguay

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Background: The foam guided sclerotherapy is one of the new mini-invasive treatment of the saphenous vein and accessory large veins we start our study in 2013 with ultrasound guided sclerotherapy (UGFST) in C2-C4 primary chronic venous insufficiency and in patients with recurrent great saphenous vein after stripping.
Methods: From January 2013 to January 2016 54 patiens with varicose veins due to incompetent great saphenous vein were treated with ultrasound guided sclerosing foam prepared according to the Tessari method by mixing 3% tetradecil sulfate with air using 2 disposable syringes and a three way tap producing high-quality micro-foam. Clinical examination and duplex scanning before and after the treatment with a mean follow-up of 2 years were done to every patient.
Results: An average of 15 ml of foam was required to close incompetent Great saphenous veins as defined by a reflux of more than 0.5 s documented by duplex scan. At 2 years after the first case all, patients felt that their legs were treated successfully with resolution of symptoms and better quality of life with complete resolution of the bulging veins in 96% of them.
Conclusions: Foam sclerotherapy is a safe and effective therapy in treating varicose veins with high patient satisfaction and improvement in quality of life.

VENOUS THROMBOEMBOLISM - CLINICAL

The experience for VTE of endovascular therapy

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Background: VTE is a "silent killer", anticoagulant therapy is the basic treatment. To relieve symptoms, as soon as possible to reduce and eliminate the PTS, it is important to remove thrombus.
Methods: To relieve symptoms, as soon as possible to reduce and eliminate the PTS, it is important to remove thrombus.
Results: Endovasclar Therapy is a kind of important surgery methods for thrombus removal. They mainly include: CDT, balloon dilatation, stent implantation, Tapas systems, Amplatz systems, Straub systems, Trellis4 systems, Angiojet systems.
Conclusions: The Angiojet system is already applied to clinical and achieved good effect, has a very broad prospect.

Postoperative endovenous heat-induced thrombosis in patients undergoing endovenous laser and radiofrequency ablation of the saphenous vein

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Background: Endovenous laser ablation (EVLA) and radiofrequency ablation (RFA) is a safe and an effective treatment for varicose veins caused by saphenous reflux. Endovenous heat-induced thrombosis (EHIT) are known complications of these procedures. The purpose of this article is to investigate the incidence of postoperative EHIT in patients undergoing EVLA and RFA.
Methods: The patients were assessed by clinical examination and venous duplex ultrasonography before operation and at 24–72 hours, 1 month, and 1 year follow-up after operation. Endovenous ablation had been treated for 1,026 limbs (835 patients) using an RFA; 1,174 limbs (954 patients) using a 1,470-nm wavelength diode laser with radial 2 rings fiber (1,470R); and 6,118 limbs (5,513 patients) using a 980-nm wavelength diode laser with bare-tip fiber (980B).
Results: The incidence of EHIT classes 2–3 was 2.7% following RFA procedure, 6.7% after 1470R, and 7.5% after 980B.
Conclusions: The incidence of EHIT following endovenous ablation was low, especially the RFA procedure. EHIT resolves within 2–4 weeks in most patients.

Prevalence and screening strategy for occult malignancy in acute first unprovoked deep vein thrombosis in Thai patients

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Background: Prevalence of cancer patients with deep vein thrombosis (DVT) was high in Thai patients. Unprovoked DVT may be the earliest sign of cancer so early detection of occult malignancy is mandatory. However, the prevalence and screening strategy of occult malignancy still unknown in Thai patients. In this study, prevalence of occult malignancy and screening strategy for occult cancer were evaluated.
Methods: Retrospective chart review of DVT patients at division of vascular surgery, Siriraj hospital from January 1st, 2012 to December 31st, 2013 was performed. Demographic data and investigation to detect cancer were recorded.
Results: In 369 DVT patients, unprovoked DVT patients was 104 (28.2%), provoked DVT patients was 106 (28.7%) and cancer associated DVT was 159 (43.1%). In 104 unprovoked DVT patients, 26 patients (25%) had occult cancer. There were 6 (23.1%) gynecologic cancer, 4 (15.4%) colorectal cancer, 3(11.5%) head neck breast cancer, 3(11.5%) hepatopancreatico biliary cancer, 3(11.5%) cancer of unknown origin, 2(7.7%) urologic cancer, 2(7.7%) soft tissue tumor cancer, 2(7.7%) hematologic cancer, 1(3.8%) lung cancer. Most of cancers (50.0%) were metastatic disease.
21 patients with occult malignancy (80.8%) were detected by history, physical examination, routine blood testing and chest x-ray before further investigations were performed. Three patients (11.5%) were diagnosed by abnormal screening tumor marker. Two patients (7.7%) were diagnosed by screening CT scan and mammogram.
Conclusions: Prevalence of occult malignancy in acute unprovoked DVT was 25%. Most of cancers were detected by a limited screening strategy including history taking, physical examination, routine blood testing, and chest radiography.

A novel approach to the treatment of chronic lower limb ulcers using bacteriotherapy

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Background: Chronic ulcers are lesions in an inflammatory state with bacterial growth that produce biofilm. The latter prevents wound healing. Conventional treatment of chronic leg ulcers is unsatisfactory. The aim of this study is to show that Lactobacillus plantarum (Lp) can interfere in vivo and in vitro with pseudomonas aeruginosa (Pa) resulting in accelerated wound healing.
Objectives: Establish the effectiveness of the application of a culture of Lp in the resolution of chronic wounds.
Method: Fifty patients were studied from the Burns and Plastic Surgery Units in the Tucuman Hospital.
The treatment consisted of a topical application of a culture of 5 by 105 Lp per ml on the wound for 10 consecutive days.
The bacterial load decreased to 2.6 by 102 by day 10. This lead to 100% healing of wounds between 12.5cm2 to 60 cm2 in size. A 20% to 50% decrease in ulcer size was noted in lesions between 200cm2 to 1200cm2.
Results: Treatment with Lp showed similar efficacy to SSD in both study groups. Granulation, scarring and decreased bacterial load were measured comparing Lp and SSD. No significant difference between the two treatments was found.
Discussion: Based on these results, the easy preparation and low cost of Lp make bacteriotherapy a valid alternative for treatment of burns and chronic ulcer.

HOW I DO IT VIDEOS

The real-time transthoracic echocardiography during Varithena injection

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Background: Injectable 1% polidocanol endovenous microfoam (PEM), Varithena® (BTG International Ltd., UK) is a safe and effective modality to treat saphenofemoral trunk vein and lower leg varicose veins. The solubility of CO2 and absorbability of O2 by circulating RBCs after injection of this PEM have been confirmed. We detect real-time gas bubbles in the heart chambers by transthoracic echocardiography during Varithena® injection in the first three cases in China Medical University Hospital in May, 2017 under standard operating procedures.
Methods: All 3 patients were treated in supine position with ultrasound-guided access of greater saphenous vein distal to the SFJ with 2 to 3 intravenous catheters (18Gx1.88 IN, BD, Sandy, Utah, US) and butterfly needles (23G, JMS, Singapore). The leg was raised to a 45 degrees angle. Trunk vein and big branch varices were treated from proximal to distal. The PEM was constrained to the treated vein by manual compression at groin and vein segment distal to the injection site for 5-8 minutes until PEM stasis in the treated segment as confirmed by ultrasound. A maximum 15mL of Varithena® was injected in 5mL doses through preset catheters. Transthoracic echocardiography was monitored and recorded throughout the procedures for gas bubbles detected when groin compression was released to check for PEM stasis in the saphenous vein.

Interest of ultrasound and foam for sclerotherapy of telangiectases

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Background: As we know, in many cases, insufficient or no treatment of the underlying reflux of telangiectases (part of C1 of CEAP clinical classification) is the cause of matting.
Methods: The objective of this presentation is to demonstrate the benefit of ultrasound and foam in sclerotherapy of telangiectases, especially for those located in the medial part of the lower limb.
This presentation shows a clinical case with telangiectases located on the medial part of the knee and of the leg.
An ultrasound examination reveals that the sources that feed these telangiectases are a segmental reflux of the GSV trunk and its tributary.
Then the refluxing veins are injected with foam sclerosant from top to bottom (GSV trunk first, tributary vein secondarily) under ultrasound guidance by direct puncture-injection with needle.
An immediate ultrasound control shows the distribution of the foam in the target veins and in the telangiectases, since the foam is echoic like a contrast agent.
Concomitantly, the telangiectases become paler and there is no need to inject them directly during this sclerotherapy session.
In conclusion, this video shows that the benefits of ultrasound and foam in the C1 sclerotherapy treatment are similar to those observed and admitted for all varicose veins: identification of the sources of reflux, relevant and safe injection sites, limited injections, adequate doses and efficiency gain.
It is logical to think that, in the coming years, their use will be more frequent even in this indication.

Ultrasound-guided foam sclerotherapy with needle

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Background: Historically, ultrasound guided foam sclerotherapy (UGFS) using direct needle puncture-injection (DNPI) is the reference technique. However, it requires a specific training and skills.
Methods: The objective is to provide tips, rules and tricks, to perform or optimize this technique.
The photos and videos will show how the authors do this technique. Some aspects will be developed: how the syringe and the probe are held, how to handle the syringe with one hand and how to coordinate both hands, how to act in a two-dimensional space, how to optimize the probe position, how to imagine the ultrasound beam...
Conclusions: This presentation could help to share experience and practice on the field of UGFS and enhance safety and efficacy of this technique.

Ultra Sound Guided Sclerotherapy of distal perforating vein must avoid injection into perforating artery and their superficial anastomosis the inter-perforating artery

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Background: The sclerotherapy of pathologic perforating vein is feasible and advantageous method in certain situations, provided that one recognizes the good indications and considers the safety of the patient. This preliminary procedure necessitates a precise anatomical knowledge of the structures that one examines, and a gradual learning of therapeutic procedures. Two anatomical structures must be known: the Perforating Artery PA and the Inter-Perforating Artery IPA in order to avoid the skin necrosis.
Methods: We will present an Ultra Sound Guided Sclerotherapy UGS of tibial posterior perforating vein PV in patient with a venous active ulcer.
Firstable, marking the tibial posterior PV by color flow duplex scanning immediately before the procedure. The limb is prepared with an antiseptic solution.
Ultra Sound US is used to guide the needle under direct vision control. The needle is placed parallel to the long axis of the probe.The remote and cautious injection is performed at the top of the perforating channel in a tangential incidence. Then the venous blood is aspirated without resistance from the vein.
Care is taken to avoid injecting into adjacents arteries: The Perforating Artery PA that consistently run parallel with the PV and their superficial anastomosis the Inter perforating Artery IPA witch run perpendicular to distal PV.

Hand rejuvenation: combining dorsal veins sclerotherapy and calcium hydroxylapatite filler injections

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Background: The hands are an important aesthetic feature that can reveal aging through surface pigmentary changes, loss of skin thickness and ectatic dorsal hand veins. Techniques addressing these changes already exists but are not routinely combined for optimum results. The presentation describes the combination techniques of dorsal hand veins sclerotherapy and sub-dermal filler injections.
Methods: The dorsal hand veins are treated with sclerotherapy (0.5% Sodium tetradecyl sulphate). This is then followed by subdermal injection of 0.75 ml-1.5 ml calcium hydroxylapatite (Radiesse) per hand, in conjunction with tumescent anaesthetic. The dorsal hands should be gently massaged for 2 minutes (per hand), twice a day for 2 days. If necessary, the procedure can be repeated after one month for further improvement.
The techniques of sclerotherapy and filler injections complement each other well in hand rejuvenation. Calcium hydroxylapatite (Radiesse) is safe and effective for hands and associated with high patient satisfaction. In suitable patients, the reduction in ectatic veins from sclerotherapy results in a longstanding improvement that complements volume restoration with fillers.

Sclerotherapy of reticular veins and telangiectasia with sclerosing agents in foam form

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Background: According to the clinical class of the CEAP classification (clinical, etiological, anatomical and pathophysiological), patients with reticular veins and telangiectasia are classified C1.
Sclerotherapy is considered superior to laser treatment in this indication and has a high grade of recommendation for C1 (grade 1A, European guidelines for sclerotherapy in chronic venous disorders).
As a result, for the treatment of the C1, in contrast to the recommendations of sclerotherapy for all other varicose veins, liquid sclerotherapy is still considered to be the method of choice (grade 1A), with foam sclerotherapy as an additional option (grade 2B).
The two sclerosing agents which can be used in the form of foam and marketed in France are polidocanol (POL) or Lauromacrogol 400 and sodium tetradecyl sulphate (TDS).
Methods: This video is about the use of these two sclerosing agents in the foam form in the treatment of reticular veins and telangiectasia.
The first part of the video is about how to prepare the sclerosing agents (dose, dilution…), and then the video shows some short examples of treatment of reticular veins and telangiectasia with the foam form.

Ultrasound guided foam sclerotherapy of the anterior accessory great saphenous vein

Pierre Ouvry

Cabinet Medical, Dieppe, France

Background: Foam-guided sclerotherapy is one of the most widely used techniques in the treatment of anterior accessory great saphenous vein. This technique is very effective in suppressing reflux, but has the reputation of exposing to a risk of pigmentation.
Methods: The video describes the technique by direct needle puncture, which is fast, safe and effective. It is possible to reduce the risk of pigmentation in the thigh.

Periorbital vein treatment with Nd:Yag long pulse laser

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Background: Periorbital unwanted veins are common problem. Sclerotherapy more often using for elimination of vein in this location but often there are bruises for 2 weeks and efficacy of 1 session achieves 60%. We try to use Nd:Yag 1064 nm laser for treatment of veins in this location.
Methods: We didn't use local anesthetic due possible spasm. All procedure were done under cryocooling machine. Nd:Yag long pulse 1064 nm laser with spot 6 mm was used. Veins were treated with next parameters: fluence 120-150 J/cm2, impulse long 15 or 45 ms. Number of shots was 10-15. After spasm or discoloration of veins was applied hydrocortisone cream.
Burns was not founded. In 20 cases (83,3%) primary veins were occluded after 1 session. In 4 cases (16,7%) was performed effective Nd:Yag laser re-treatment. In 41,6% we found temporary swelling and easy tenderness during 2-7 days. The occluded vein was noticed during 2-4 weeks after session in 58,3% of cases.
Transdermal laser treatment is a great alternative of sclerotherapy for periorbital cosmetic veins. There are no risks of serious complication such like necrosis tissue and thrombosis of corner eye vein.

CLaCs guided by augmented reality: how do I do it

Kasuo Miyake, Marcelo Grill

Centro de Estudos Hiroshi Miyake, São Paulo, Brazil

Background: CLaCS is an achronym that stands for Cryo-Laser and Cryo-Sclerotherapy. The technique aims to treat telangiectasias and its causative feeding veins. More than 20 countries are using CLaCS to treat aesthetic lesions in low CEAP cases or after functional treatment done by foam or phlebectomy or thermal ablation.
Methods: CLaCS is a synergy of transdermal laser, skin cooling and sclerotherapy with Dextrose75%.
CLaCS in steps: 1) Diagnosis: ultrasound imaging to spot all feeding veins and be sure that they are smaller than 1.5mm in internal diameter by ultrasound and not connected to refluxing perforant and/or saphenous vein. 2) Augmented reality is used to perform that photo-documentation and to guide CLaCS. 3) Transdermal laser is shot on the top of the telangiectasias and feeder veins. The energy set is lower than the factory settings. Lower energy but with more passes. 4) Injection sclerotherapy is performed right after the transdermal laser. 5) Cotton balls are placed with adhesive tape.

Percutaneous inverted saphenectomy

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Background: Foam, thermal ablation and non-thermal endovenous treatments are the trend for saphenous vein reflux treatment. Even though, we believe that there are many situations where the extirpation a segment of the refluxing saphenous vein might be a good option. We

present a new idea for extirpating the saphenous veins by using the technologies that we have nowadays.
Methods: Duplex US is performed, and a percutaneous distal entry point is chosen. With the use of local anesthesia and ultrasonographic guidance, the GSV is punctured. An introducer sheath is placed into the GSV. A hydrophobic guidewire is introduced into the sheath and advanced to the desired point where there is no reflux or another technique is going to be used for treatment. Palpation and/or ultrasound imaging is used to locate the guidewire and a small incision is made with blade 11. The saphenous vein is cut and the proximal part is tied. A strong surgical thread (SST) is tied on the distal part of the guidewire and towed into the vein to be removed. The proximal part of the vein to be removed is tied onto the SST. The SST is pulled from the distal entry point and the vein starts to invert. The procedure is delicate and any tension indicates the possibility of a tributary that will need to be cut and ligated.

Ultrasound guided regional anaesthetic techniques for use in procedural phlebology of the lower limb

Nicholas Kemp
The Leg Vein Doctor, Toowong, Australia

Background: International guidelines for the management of varicose veins now recommend the minimally invasive techniques of endovenous thermal ablation and ultrasound guided sclerotherapy in place of conventional surgery which involves high ligation and stripping of the saphenous veins.
Minimally invasive techniques which be performed in an office based environment obviate the need for hospitalization which is required for invasive surgical procedures where general anaesthesia is necessary.
A number of ultrasound guided regional anaesthetic techniques are available that can be easily employed to assist with the minimally invasive techniques. Improvements in ultrasound technology with new high frequency linear array transducers now enable easier visualization of peripheral nerves.
Methods: The video presentation will provide a description of the following ultrasound guided regional nerve blocks. 1. Femoral nerve block; 2. Saphenous nerve block; 3. Genitofemoral nerve block; 4. Ilioinguinal nerve block.

Laser hemorrhoidoplasty - technique and outcome

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Background: Laserhemorrhoidoplasty (LHP) is a rather new minimal invasive, non excisional treatment for prolapsing hemorrhoids grade 3-4°. We want to demonstrate the surgical technique and long term results in a large cohort.
Methods: Laser treatment was executed for each pile using a diode laser with 8 watts of energy at a wavelength of 1470 nm and a pulse mode of three seconds. A specific designed laser fiber with a sharp tip and a controlled tissue radiation of 2-3 mm was used.

A painless Seldinger technique

Sebastien Gracia
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Background: During a thermal ablation, we need to create an access to the saphenous vein to allow the insertion of the radiofrequency catheter or the laser fiber. This is called the Seldinger technique. Also, it is not very painful, we could still improve the level of patient's comfort further.
Methods: Customarily, we use an anesthetic solution buffered with bicarbonate.
First, we make a little injection with a 25 Gauge needle to the place we want to puncture the saphenous vein.
Then, we puncture the vein under DUS.
In the needle, we insert the guide.
The needle is pulled back.
Before putting in the introducer and the dilator we inject an anesthetic solution along the guide with a 21 Gauge needle of 50 mm in length. This will create a protective anesthetic cover around the vein and will make the insertion of the introducer painless.

Real time, cloud based phlebologic documentation

Alexander Flor
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Background: Documentation is an indispensable but time consuming part of our daily work.
For those who work scientifically, for those who collect special cases or those who store a lot of aesthetic cases video and photodocumentation is even more important.
Various programs have been developed to fulfill our wishes, in the end many of these programs even are more time consuming than former handwritten documentation.
Methods: In my presentation I want to give a short overview of our Google Docs, and Dragon Medical based documentation system. Each recorded ultrasound examination sequence can be looked at from every PC, tablet or cellular Phone within the network eachtime and everywhere on the planet. No disk space is required. Videos can be stored in endless capacity. Pre- and post pics are inserted automatically in the patients' medical history at the moment as they are taken.
At the moment we take a picture, it arises automatically and wireless on a 4k HD screen.
Each coment you write might be seen on any other PC in realtime, every written phrase you know who wrote it and on which device it was written and at which time.
In a case of loss you can restore your data by inserting in the date before it had got lost.
Documentation is saved for 35 years fulfilling requiremants of Medical and Juridical standards.
Data protection is provided by a dual password system.
In my presentation I although want to refer to yo my experience with Dragon Medical since 2011, a speech recognition solution designed for physicians which has been integrat leading electronic health records.
As we had some revolutionary advances in Phlebology since 2000 with the introduction of endovascular techniques we observed also revolutionary changes these days by the use of new cloud-based digital systems.

Retrograde ablation of great saphenous vein using inferior epigastric vein as access vessel

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Background: Catheter based endovenous thermoablation (EVTA) is the recommended treatment for truncal superficial venous reflux. During

EVLT a treatment, the great saphenous vein (GSV) is accessed percutaneous under ultrasound control, from distally. Occasionally, this access route is impossible due to haematoma from failed cannulation, scar tissue or other anatomical variants. We describe a retrograde cannulation approach, via the inferior epigastric vein (IEV) from proximally. Retrograde cannulation has been reported in the small saphenous vein, but it is not well recognized in the GSV.
Methods: The patient is prepared for EVTA and preparation extends above the groin onto the lower abdomen. The patient is supine in the 30° head-up position. Ultrasound guided cannulation of the IEV is guided by an ultrasound with a narrow z-axis, in a longitudinal position.
The EVTA catheter is passed through the IEV into the GSV to the distal point of treatment. The patient is placed 30° head-down. Tumescence is placed under ultrasouund guidance. Ablation is started distally, withdrawing the catheter to the proximal GSV. Care is taken to stop ablation short of the junction of the IEV and GSV to allow the saphenofemoral junction to remain patent from flow from the inferior epigastric vein, to reduce the risk of thrombus (EHIT).

Negotiating tortuous great saphenous veins whilst performing endovenous thermal ablation

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During Endovenous Thermal ablation using either laser fiber or a Radiofrequency catheter, the great saphenous vein is cannulated below the knee and a short sheath is introduced percutaneously, through which the relevant equipment is introduced upto the Saphenofemoral junction. Sometimes, the course of the LSV is markedly tourtous, or punctuated with many outpouchings along its length, which makes advancing the fiber very difficult, and in some instances impossible, necessitating multiple punctures along the length of the LSV.
Our video will demonstrate how we use a 0.035 inch Hydrophillic Terumo guide wire to negotiate the markedly tortuous veins, and then introduce a 5 French 45 inch long guide sheath into the vein, which is placed at the SF Junction. The laser fiber or the RFA catheter is then passed through this catheter, and both the elements are withdrawn simultaneously during the endovenous thermal procedure. The same technique can be used to close a very large tortuous dilated non truncal varicose branch in the thigh.

How I treat the vein of Giacomini by endovenous laser

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Background: The safety and effectiveness of endovenous laser treatment for varicose veins are evaluated for approximately fifteen years.
The thigh extension branch, also known as the vein of Giacomini in many patients, may also contribute to venous pathology.
Until now, a video about endovenous laser treatment of the Giacomini vein has not been reported.
Methods: EVLA (1470 nm diode laser-radial fibre) was performed under local tumescent anesthesia. The refluxing vein of Giacomini was entered under ultrasound guidance.
Tumescent anesthesia was administred under ultrasound guidance
The fiber was pulled back continuously at a rate corresponding to 80 J/cm (power setting 11 w)
Endovenous laser ablation with a 1470-nm wavelength is an effective and safe procedure for treating an incompetent vein of Giacomini.

Percutaneous valvuloplasty - A new modality to restore valve insufficiency

Johann Chris Ragg
Angioclinic Vein Centers, Berlin, Germany

Background: Percutaneous valvuloplasty may be applied in candidates with insufficient vein valves due to congestion or dilatation, as long as the cusps are intact and mobile. The method uses an ultrasound-guided perivenous injection of hyaluronan to achieve a long-term lumen reduction and potentially a restoration of the valve function. Several pilot studies, using different types of hyaluronan (small or large particles) have been successfully performed.
Methods: Treatment on tilt-table. Selection of the target region by ultrasound examination. Marking of the access point. Disinfection like for local surgery. Local anesthesia (<1 ml, *e.g.* lidocaine 2%). Charging of the injection tool with hyaluronan unto the tip to prevent air shadows. Penetration of skin and fascia. Then the tip of the injection instrument is switched to blunt to prevent incidental vein damage. Distribution of the hyaluronan around the valve segment until desired diameter is reached. Confirmation of hemodynamic result by raising the tilt table.

How to deal with severe recurrent varicosities

Johann Chris Ragg
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Background: Recurrent varicosities and their treatment are still a problem, although the tendency to quit surgery and to prefer endovascular techniques is quite clear. With the background of a large European clinic specialized in non-surgical therapy, techniques and strategies for different situations are shown.
Methods: Ultrasound detection of the entire pathology, including phlebography in selected cases (<10%). Local anesthesia. Multiple microcatheter access. Tumescent anesthesia in segments selected for thermal treatment (*e.g.* saphenous stumps). Perivenous saline or hyaluronan infiltration for the compression of large, non-superficial segments. Vein closure by combination of endovenous laser (810-1470nm), common microfoam and biomatrix sclerofoam, integrating means of target vein evacuation and deep vein flow acceleration.
Conclusions: With external compression, depending on target size and position, including film bandage and silicone pads.

The hydro-separation approach of sural nerve with controlled ultrasound-guided tumescent anaesthesia in endovenous laser therapy of small saphenous vein

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Background: Thermal Endovenous treatment is a minimally invasive technique for ablation of the small saphenous vein (SSV). The goal of this technique is to obtain a permanent closure of SSV and to avoid complications like nerve injury.The sural nerve runs in proximity to SSV in the third distal of calf sometimes in close contact in the saphenous compartment. Besides the technical mastery, the tumescent volume needs to be controlled especially in certain patients with renal or cardiac insufficiency.
Methods: Step 1: Anaesthesic solution is injected first intra-dermally with small bleb in the repaired mark using a 30-gauge needle at regular intervals of 5 cm.
Step 2: Linear transducer is placed perpendicularly (transverse) to ve-

nous axe. With saphenous vein centrally positioned, the transducer is rotated 45° inverse clockwise.
Step 3: skin is punctured with 22-gauge needle in plane view always in short axe of the vein in tangential incidence. The first injection is started after reaching the outer limit of the vein wall in order to obtain a rapid hydro-compression then the needle is intentionally advanced in targeted tissues betwenn SSV and nerve. The aim is to favor a hydroseparation of sural nerve by small pulses injections.

How I do it: recurrence vein treatment of GSV with the 2-ring-laser (Biolitec)

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Background: Recurrences after Babcock operations or thermal ablation procedures often result from too long-left Great Saphenous vein stumps. Their open revision operations are technically complex and burdensome for the patient. With the Radial-laser it is possible to treat these recurrences quickly and gently. Experiences from 5 years of application are reported.
Methods: In the period from June 1, 2011 to January 30, 2015, 502 patients were treated with vein recurrence in the junction after Babcock surgery or thermal catheter ablation. All interventions were done in ambulatory in short anesthesia. The lateral branches were treated in intervals by foam sclerotherapy. Insufficient and clinical relevant perforators, as well as straight refluxing venous sections, were treated in the same session with the catheter. Color duplex examinations were performed on the postoperative day, after 7 days, 6 weeks and annually. The impairment of pain was assessed by the visual analog scale (pain score). (1st day, 7th day, 6 weeks).
Results: Of the 502 patients treated, 490 patients could be re-examined. The occlusion rates were 92,6% after 1-7 days (N.=462), 91,2% after 6 weeks (N.=342) and 1 year after at 93,3% (N.=120), 2 years after (N.=57) at 91.2%. The foam-sclerosation of the lateral branches took place after 6 weeks. On the following day, all patients were able to follow their daily routine. An inability to work was not issued. Major and minor complications did not occur. The pain score was 1.0 on day 1, on day 7 0.5 and after 6 weeks on 0.
Conclusions: The Radial-laser is a gentle and safe treatment of veins stumps in the groin. Inpatient treatment and incapacity for work are no longer required. Due to the high degree of technical difficulties, the procedure should be performed only in designated centers with a rich experience in endovenous catheter techniques. The treatment of GSV recurrences will be shown by video.

Closure of a direct perforator vein by cannulation using a simple, inexpensive angiocath device and laser fiber

Shoaib Padaria

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Larger Incompetent perforator veins need to be closed when they are in the vicinity of or underlying a non healing Varicose Ulcer. Surgical closure means incisions in already damaged skin, and can be very painful.
We demonstrate whereby we can achieve direct, permanent closure of the Direct incompetent perforator with local anesthetic under ultrasound guidance. Our equipment consists of a 18 guage simple venous cannulation device (Angiocath) which is a needle with a plastic sheath. The 600 micron laser fiber length is first measured so that only the tip extrudes from the tip of the Angiocath sheath. After giving local anesthetic to the skin, the Angiocath is inserted directly into the Incompetent perforator under ultrasound guidance,. The metal needle stylet is removed, and the laser fiber inserted. Generous amounts of Tumescent anesthesia is injected all around the angiocath sheath, and laser energy is delivered, achieving immediate and permanent closure of the incompetent perforator. The entire ablation procedure should take less than 3 minutes to complete.

Double tumescent anesthesia for a less painful thermal ablation of a saphenous vein

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Background: Local tumescent anesthesia is essential during a thermal ablation procedure with radiofrequency or laser. First, to protect surrounding tissues from thermal damage and then, to narrow the vein onto the laser fiber or the radiofrequency catheter promoting treatment uniformity. But this is also sometimes a paintful moment for the patient. We are trying to find a solution to increase the patient's comfort and lower the pain.
Methods: We choose to use a buffering solution with bicarbonate. Numerous trials have shown less pain when compared with saline solution non buffered. This helps us to lower the pain linked to the hydrodissection. However, it does not erase the pain caused by the punctures. Since last year, we have been applying a new type of local tumescent anesthesia. First, we inject a very superficial anesthesia (just below the skin) beginning close to the introducer of the saphenous vein. Then, we continue the local anesthesia a few centimeter away from the first puncture in a area already desensitived. We repeat this procedure at consecutive intervales along the entire vein. Consequently, the skin is entirely desensitived along the vein. Now, we can practice classic tumescent anesthesia arround the vein in the interfascial compartment. The patient will not experience any additionnal pain because the skin is completly desensitived.
Conclusions: To conclude, the time and the quantity of anesthesia solution increase but the patient's comfort is much improved and the pain has almost diseappered.

Closure of indirect perforator veins by closure of the draining superficial venous segment

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Many a times it is seen that there are a bunch of incompetent perforator veins which are present just above the ankle, and all of them drain either into the distal Long Saphenous Vein or the Posterior accessory vein. In such cases which are associated with significant Lipodermatosclerosis, edema or non healing venous ulcer, it is imperative to close these perforator veins. A simple method of closing all of them together is to close the superficial venous segment into which they drain into. This can be achieved either by use of Laser or Radiofrequency ablation with use of generous use of Tumescent anesthesia.
The video will demonstrate the ease and simplicity of closure of the superficial segments, and the subsequent ultrasound showing abolition of reflux in all the draining incompetent perforator veins.

Pelvic congestion syndrome treatment

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Background: Pelvic congestion syndrome (PCS) is associated with chronic pelvic pain, pelvic varices and pelvic venous hypertension. We have an experience of examination and treatment of 27 women with PCS. Combination of PCS and varicose veins of lower extremities was found in 12 women (54,5%). The aim of our study was to improve treatment results in 27 women aged 29-38 years (median 33,5 years) with PCS by eliminating the cause of disease in pelvis and venous outflow correction of the lower extremities.
Methods: Patients underwent an ultrasound examination (US) of the lower extremities, transvaginal ultrasound (TUS), selective angiography and computer tomography (CT) on indication. Obstructing anomalies (signs of Nutcracker phenomenon or May-Thurner syndrome) were excluded.
Results: The main diagnostical method was selective angiography with iohexol 350. Embolization with aetoxisclerol 3% 8-10 ml foam, Gianturco coils (Cook) was made in 22 patients. We have performed endovenous laser ablation of ovarian vein in 2 patient using a 1470 nm diode laser (radial 2ring fiber) and radiofrequency ablation of ovarian vein in 3 patients.
Methods: We believe that endovenous procedures may be used for treatment of PCS. First results of endovenous procedures are encouraging.

Cryostripping for SSV incompetent: in special case

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Background: There are various methods for treatment of SSV incompetent. they have both advantage and disadvantages. so surgeon must consider the reflux range, anatomical relationship, diameter of SSV and cost effectiveness.
But in case of extended reflux of SSV (below the mid-calf) and large diameter of SSV (>10 mm) more consideration is needed. cosmetic problems and pain, nerve and vessel injury can be occurred during conventional stripping. numbness and recanalization can be occurred during endovascular ablasion.
The purpose of this study is to showing the efficacy and safety of cryostripping by mininal incision on popliteal fossa.
No major complication was seen. (mild numbness 4, neovascularization near the SPJ 2).
Cryostripping have no chance recannalization and less traumatic than other modality.
Methods: Patients diagnosed with only SSV incompetent and treated with cryostripping between July 2014 and June 2016 were enrolled in this study. (70 patients with 98 limbs) they have reflux from SPJ to under mid-calf level and the diameter of SSV on mid-calf level was larger than 10mm.
Small incision is made (about 0.5cm) on popliteal fossa along the skin crease, near the SPJ in supine position. next, SSV in picked up with sonoguide needle pucture. proximal strump is double ligated and cryprobe is advanced to the level of relfux distally. after indentification of sural nerve, regardless of indentification, tumescent solusion is inserted around the SSV to sperate sural nerve from SSV. (about 1cm of halo). and then stripping is followed.

Building the vascular services center of excellence Airlangga University Hospital, Indonesia

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Cardiothoracic & Vascular Surgery, Universitas Airlangga Hospital, Surabaya, Indonesia

Background: Being the Center of Excellence, Airlangga University Hospital is one of the essential initiative project empowering the Dreams and Hope of The Universitas Airlangga, as the World Class University in the near future.
One of the Feasible project is The Vascular Services in The Airlangga University Hospital.
Methods: We planned and underwent our project to empower the project programs, by the educations, services and also research of Vascular Surgery topics in the Airlangga University Hospital.

Endovenous laser ablation 1470/1560 nm with high leed, radial fibers, automatic pull back and laser power meter

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Background: Linear endovenous energy density (LEED) is the most important factor influencing the success of endovenous laser ablation (EVLA) of saphenous veins.
Methods: From 2015 we used high LEED treatment protocol 85-200 J/cm (mean 105,1) on 1820 consecutive patients, C2-C6. GSV 67,4% (extrafascial segments 15,9%), SSV 15,4%, AASV 9,1%, GSV+SSV 4,5%, GSV+AASV 3,6%. EVLA was performed on an ambulatory basis with tumescent anesthesia, diode lasers 1470/1560 nm, radial fibers, automatic fiber pull-back speed 0,7-0,5 mm/sec. Before each procedure we performed measuring of the real laser power at the fiber tip with "Ophir" power meter. Ultrasound imaging was performed on the 1st, 7th, 14th day and 6 months after EVLA.
Results: We achieved primary occlusion of saphenous veins in 100% of patients. We observed a very low incidence of recanalizations after 6 months, only in 2 patients. "Ophir" power meter in some cases revealed significant decreasing of laser power due to diode laser or fiber. Only 6% of the patients took analgesics on the first day after EVLA. Endothermal heat induced thrombosis was revealed in 1,1% of patients in first two weeks: EHIT II – 0,6%, EHIT III – 0,5%.
Conclusions: EVLA 1470/1560 nm with high LEED, radial fibers, automatic pull back and laser power meter is a highly effective, safe and painless procedure.

The Gan gutters - optimising set up in endovascular interventions

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Background: There is great interest in the ways to mitigate surgical complications. Of these, staff error and surgical site infections often pose important factors in the set up of the patient. Non technical skills for trainees in preparation, communication and decision making are fundamental to the flow in theatre. Trainees can benefit from these skills by implementing a simple set up in procedures that have the potential spillage or risk of contaminating the wound. The Gan gutters is a simple but

effective set up for these procedures, such as endovascular intervention or laparotomies, whereby surgical drapes are folded into slanted gutters along the sides of the patient. The notion of this double river bedded gutter acts to allow spillage to safely slide down the opposite end reducing the risk of surgical contamination to the wound. It also acts as a safety barrier to reduce the risk of contaminants and bodily products directly onto the theatre staff. The implementation of this novel idea into our surgical practices has aided to increased non technical surgical skills in preparation and communication for trainees. It also has helped reduced the spillage and contaminants in larger cases that could potentially cross contaminate. The trainees have found this as a novel idea that can be implemented safely into other areas of surgical practice for surgical and patient safety.
Methods: The patient is surgically preped in the standard fashion as per local protocol. Once the surgical drapes have been placed over the surgical site, for instance the abdomen, the right flank drape is folded about a hand breadth below the axilla from bottom to top forming a U shaped gutter. This is secured with a surgical clip. The farther end of the drape at the iliac crest is similarly folded about one and half hand breadths from bottom to top forming a U shaped gutter. This is secured with a surgical clip. The right side U shaped gutter should be sloping downwards to encourage flow of spillage. The procedure is similarly performed in the same fashion on the left hand side using surgical clips.

It is a good idea to just cover the varicose vein or ulcer with a tattoo?

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Background: Tattoos just cover the unsightly veins, rather than fixing the problem. It's literally a cover-up, the result is not always pleasing, and may worsen over time, especially if the vein itself is pierced, most important, you need to be sure your spider and varicose veins are simply a cosmetic problem. The appearance of spider and varicose veins is your body's way of indicating that blood is not flowing completely from your legs back to your heart. The pooling of blood, a result of vein valves improperly functioning and weakened vein walls, may be a sign of greater issues in the legs and/or pelvis that require treatment.
Methods: Tattooing is a unique body modification technique that injects ink into layers of the skin using a special needle attached to a rotary or coil machine. This process creates permanent designs in the skin that can only be removed by a high-powered laser skin-resurfacing device. Tattoos often have a cultural significance or meaning to them, which is why getting one can be a very tough, yet personal decision. We present here a case of a varicose vein ulcer cover by a tattoo of a mermaid all over the leg the ulcer were treated under laser ablation with excellent cosmetic and surgical result.

Thrombectomy followed by a foam injection, after saphenous vein thermal ablation

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French Society of Phlebology (Société Française de Phlébologie), Paris, France

Background: Thrombectomies of the GSV can be performed after thermal ablation even though they are less frequent than thrombectomies of varicose veins after sclerotherapy. They could reduce the risk of cutaneous hyperpigmentation.
Methods: The objectives of this presentation are to show:
- How the authors perform a thrombectomy of a GSV under ultrasound (US) guidance
- The possibility of injecting foam in the GSV after the removal of blood.
The presentation will develop the different steps of a thrombectomy done under US guidance: criteria of decision to perform it and when, how to choose the site of puncture, how to choose the needle and how to guide it in the vein…
Then the video will show the injection of foam following the thrombectomy.
Finally, the presentation will show the patient's lower limb at a further visit at 2 month-follow-up.
Conclusions: This presentation could help to share experience and practice on the field of thrombectomy of varicose veins done under US guidance after thermal ablation. It also raises the question of the relevance of a foam injection after the removal of the blood.

Hybrid approach to AVM: how I do it

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Vascular Surgery, Fortis Hospital, Mohali, India

Background: Arteriovenous malformation (AVM) treatment can be very challenging. Various techniques and approaches have been used in past. We use Hybrid approach to treat AVM, which gives very good result.
Methods: Preoperative radiological investigation gives a fair idea about planning your treatment. Endovascular approach is used to reach the nidus of the malformation and to embolize it with ONYX or alcohol. Also percutaneous approach is used to stop venous outflow with glue or onyx. All AVMs which were embolized with hybrid approach, required lesser number of sittings to completely embolize the AVM compared to only endovascular embolization. Better closure was seen with the hybrid approach. Hybrid approach to treat AVMs give better result.

From phlebectomy to microphlebectomy

Arnold Kadiss

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Background: Vein problems and vein removement are very actual from ancient time till now. Long and traumatic incisions during phlebectomy leads to big scars, neovaricosity. Nervs and mainly limphatic vesells damage are often seen after vein operations. Extensive pain after long incisions also influences life quality after phlebectomy.
Methods: The presention and film deals with development from phlebectomy through incisions 3-5 cm and more to miniphlebectomy 5 mm and less and microphlebectomy 1 mm and less at the present time. Practical aspects of operation will be shown. Film will cover also tips and tricks. Possible problems will be discussed during presention.

Cyanoacrlyate adhesive ablation - video presentation

Nick Morrison

Morrison Vein Institute, Tempe, United States

Background: The novel cyanoacrylate ablation procedure has been shown to be as safe and effective as RF ablation. This video will present the procedure in detail.
Methods: This video presentation will describe the procedures of cyanoacrylate adhesive ablation in detail with narration by the operating surgeon. Tips and tricks will also be described.

Endovascular treatment the incompetent middle-thigh perforating vein with great saphenous vein preservation

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Background: The incompetent middle-thigh perforating vein (MTPV) is a frequent source of varicose veins in the great saphenous vein (GSV) system without saphenofemoral reflux. The incompetent MTPV often falls into GSV from the back side perpendicular as a direct perforator between GSV and femoral vein. Surgical ligation of MTPVs is complicated and requires a large incision. The endovenous laser ablation (EVLA) usually held for a secondary incompetent segment of GSV, but the residual MPTV in some cases becomes the cause of recurrences.
Methods: To preserve competent GSVs we perform selective catheterization and EVLA of the incompetent MTPV. If the portion of MTPV has a straight part (at least 3 cm) running parallel to GSV, we perform a catheterization of this segment. In the case of perpendicular falling of MTPV from the back side of GSV with a short portion (directly to its confluence with a femoral vein) or tortuous MTPV (without straight sections), the only way to place the catheter into MTPV is to pierce through GSV with a perpendicular puncture above MTPV ostium. After the penetration into GSV lumen, you pulling back the needle on 2mm inside the plastic intravenous catheter. After that, the end of the catheter is softly placed into the ostium of MTPV. A slim radial or bare-type fiber can be applied. Local tumescent anesthesia is carried out by an introduction of 20 mL of 0.05% solution lidocaine. EVLA is performed with the 1470nm laser, 7 W and manual traction speed of 1 mm/s or slower. The laser is switched off at 5mm before GSV. Ultrasound control during pulling back allow avoiding thermal obliteration of GSV. The operation takes about 5 minutes. The next day, the GSV pathological reflux usually doesn't detect during the functional tests. Additional studies are needed to assess the long-term results of such GSV preserving treatment.

Ilio-caval obstruction stenting: results of 100 consecutive limbs

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Background: We present results of 100 consecutive cases of iliocaval obstruction treated with surgical intervention collected over the last 5 years. The group consists of both thrombotic and non-thrombotic obstructions, chronic, acute and subacute cases. Most frequently performed intervention was an endovascular repair by angioplasty and stenting and also femoral vein endohlebectomy with or without arterio-venous fistula, thrombolysis of acute and subacute DVT affecting iliofemoral veins or IVC.
Methods: We present overall stent patency, failure rates, complications and revascularization effect on symptoms recorded.

Foam sclerotherapy – the 'English Method'

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The treatment of varicose veins with foam sclerotherapy has become widespread. The technique was originally published by Juan Cabrera in 1995. Cabrera's technique necessitated the injection of large volumes of foam. The current licensing of sclerosant foams indicates that limiting the maximum injected volume to about 16 mL which leads to reduced efficacy of treatment.
This presentation shows a method which has been developed in the UK in order to overcome the limitations of foam sclerotherapy with small volumes of foamed sclerosant.

ART IN PHLEBOLOGY

Leg varicose veins of pelvic origin: venographic mapping of venous escape point

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Background: Venography and duplex ultrasound are commonly used in phlebology to diagnose and treat venous diseases.
Transvaginal duplex ultrasound has been shown to be the gold standard technique for assessing the haemodynamics of the pelvic veins.
We use it to assess the pelvic veins in patients with varices coming from the pelvis and communicating with leg varices, those who complain of labial or perineal varices or those who have pelvic congestion symptoms.
During transvaginal ultrasound scanning, we can assess the ovarian veins, arcuate veins and internal iliac veins and can demonstrate reflux in these with duplex ultrasound, if it is present. A full diagnostic picture of the pelvic and legs veins is created which is used for pelvic vein coil embolization procedure (PVE).
Methods: During PVE, a catheter is passed through the jugular vein, through the Inferior Vena Cava (IVC) and into the pelvic veins.
Contrast is injected to create a vein map to show where a coil should be deployed.
In the subtraction venogram below, the catheter is situated in the right obturator vein, and after injection of contrast, the pelvic varices are seen communicating with the superficial leg varices.
This venogram was taken on a patient who was diagnosed with pelvic vein reflux using transvaginal duplex ultrasound.
This venogram image was taken during her subsequent PVE.
It perfectly demonstrates pelvic varices leading onto leg varices, and hence why pelvic vein reflux must be considered in those with varices seen communicating between the pelvis and legs.
Description: Subtraction venogram showing the catheter placed into the right obturator vein with contrast injected.
Communication between the pelvic veins and leg veins are clearly demonstrated in this image.

Full body augmented reality lightpainting. Thigh veins below resilient telangiectasias: are they feeding causative veins or just normal veins?

Kasuo Miyake

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Description: A 36 yo patient complaining about telangiectasias, mostly on the lateral part of the thighs. She reported that the legs appearance affects significantly her quality of life because she lives in a warm country. Ultrasound examination diagnosed reflux on both great saphenous veins and left small saphenous vein. Patient was positioned in a treating bed covered with a black sheet. All walls, the augmented reality device were covered in black and augmented reality operator was wearing black clothes including hood and gloves. A Canon 5D Mark IV with sensor CMOS 31MP and Canon Lens L Series 28-70mm 2.8f was used. The camera was placed on a tripod. Room was almost completely dark and the shutter remained opened for 20-30 seconds while the patient was painted continuously with augmented reality images. The resulting image is from one single photograph. The photograph conformed to the guidelines of the 1975 Declaration of Helsinki and was approved by our institutional ethics review board.
Discussion: Resilient telangiectasias can be the cause of diminished quality of life, mostly in women from tropical and subtropical countries. To achieve the best result in any field, a thorough examination is imperative. Modern devices like duplex ultrasound and augmented reality can spot veins bellow telangiectasias. It is controversial but we believe that those veins are feeding veins and we treat them with CLaCS, phlebectomy or endovenous laser. Many countries have regulatory rules that impede ultrasound examination in asymptomatic patients. We work in a private clinic and we perform ultrasound and augmented reality examination in all patients. From our records, 33% of our asymptomatic patients have reflux on the saphenous vein. The objective of this art-photography is to stimulate the discussion of the importance of diagnosis and study of the feeder veins. The Controversy: To Treat Or Not To Treat? Our answer is YES! We Perform Clacs on the feeder veins and telangiectasias. We clacs those veins if they are smaller than 1.5 mm (internal diameter by ultrasound in upright position) and we perform endovenous laser or ligation if the feeder veins are connected to axial reflux. Photograph by Ivan Berger and Lightpainting by Kasuo Miyake.