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Résumés d'articles publiés dans la revue « Phlebology »

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Original article

Variations in ultrasound scanning protocols in the UK for suspected deep vein thrombosis in outpatients.

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Abstract: **Aims:** To assess current ultrasound scanning protocol in outpatients with suspected deep vein thrombosis (DVT), in particular whether practitioners routinely scanned calf veins.
Methods: A standard questionnaire was sent out via post to all radiology departments in the United Kingdom (UK) and via the British Medical Ultrasound Society (BMUS) website in 2010. Responses were entered into Access® and database queries were run to analyse responses. Free-text comments were taken into account in our analysis.
Results: A total of 277 responses (50 through the BMUS website) were received (46% postal response rate). Of them, six were excluded as these were incomplete. Thus, 97 (36%) were consultants, 13 (5%) accredited vascular scientists (AVSs), 153 (56%) sonographers and six (2%) higher radiology trainees. All AVSs scanned the whole limb and used all three modalities of compression, colour and pulse wave Dopplers. Practice across other healthcare professionals varied. In all, 120/176 (68%) of other health-care professionals trained in vascular ultrasound scanned the whole limb routinely and 82/120 of these used all three scanning modalities. Trained sonographers scanned the whole limb significantly more than the medical cohort ($P = 0.017$). The use of all three modalities varied significantly between AVS and the non-AVS trained professionals ($P = 0.0194$), the trained medical cohort of consultants and sonographers ($P = 0.0001$), and trained and non-trained respondents ($P = 0.0113$). The commonly chosen reason for not scanning the whole limb was that it had poor sensitivity for calf vein DVTs. Free-text reasons for not scanning the whole limb routinely included local protocols prohibiting it. Conclusions: There is a discrepancy between the scanning protocols of medically trained and allied health-care professionals, trained or otherwise in vascular ultrasound, and between these groups and AVSs. This is likely to have an impact on clinical governance.

Keywords: DVT, ultrasound, vascular, protocol.

Phlebology 2013;28(8):397-403.

Original article

Early re-presentations and the potential role of catheter-directed thrombolysis in patients diagnosed with a lower limb deep vein thrombosis: a single-centre experience.

Chandra E.[1], Ahmadi M.[1], Bailey M. A.[1], Griffin K. J.[1], Berridge D. C.[1], Coughlin P. A.[2], Scott D. J. A.[1]

1. Leeds Vascular Institute, Leeds General Infirmary, Leeds. 2. Department of Vascular Surgery, Addenbrookes Hospital, Cambridge, UK.

Abstract: **Introduction:** Catheter-directed thrombolysis (CDT) for iliofemoral deep vein thrombosis (DVT) restores venous patency, reduces the risk of the post-thrombotic syndrome and may reduce longer term treatment costs. This study assessed the potential role of CDT in patients with DVT with regard to representation following the index event.
Methods: A retrospective review of all patients with a positive lower limb DVT scan. Potential suitability of each patient to undergo CDT was based on well-recognized inclusion/exclusion criteria.
Results: In total, 1689 patients underwent a DVT-specific lower limb venous duplex. A total of 269 were found to have a DVT. Fifty-three of these patients met the inclusion criteria for CDT (only 2 underwent CDT). Fifty-nine of the 269 patients with an index DVT re-presented to our institution with a venous thromboembolism-related clinical event. These patients were significantly younger than those who did not reattend. A higher proportion of patients who represented were deemed suitable for CDT for the index DVT compared with those who did not represent (17/59 versus 36/210; $P = 0.04$).
Conclusion: This pragmatic study highlights the fact that significant number of patients return to secondary care with actual/perceived complications following initial diagnosis and treatment of a DVT which may have been amenable to CDT.

Keywords: deep vein thrombosis; catheter-directed thrombolysis

Phlebology 2013;28 (8):404-8.

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Original article

Assessment of jugular endovascular malformations in chronic cerebrospinal venous insufficiency: colour-Doppler scanning and catheter venography compared with intravascular ultrasound.

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1. Cardiovascular Catheterization Laboratory. 2. Phlebo-Lymphology Diseases Center. 3. Biostatistics Unit, Policlinico di Monza, Monza, Italy.

Abstract:

Objectives: Chronic cerebrospinal venous insufficiency (CCSVI) is a malformative condition characterized by several anomalies of the azygos and/or internal jugular veins (IJVs). Recommended diagnosis of CCSVI is performed with colour-Doppler (CD) sonography. Though catheter venography (CV) is considered as the gold standard for determining vascular anatomy, its uniplanar point of view does not allow an overall evaluation of endoluminal structures. This limit could be addressed by intravascular ultrasound (IVUS). The aim of this report is to evaluate, in patients with multiple sclerosis (MS), the accuracy of CD sonography and CV versus IVUS in estimating the diameter and the crosssectional area (CSA) of the IJVs and in detecting jugular endoluminal malformations (JEM).

Method: Forty-five MS patients with CCSVI, diagnosed by CD sonography, were submitted to CV during IJVs angioplasty. Twenty-five subjects were also examined with IVUS. The IJVs maximum diameter (MAXD) and CSAwere estimated. CD and CV data were compared with IVUS data with the Bland-Altman method.

Results: The mean difference in IJV MAXD recorded by CD and IVUS was 20.5 mm. The mean difference in IJV MAXD recorded by CV and IVUS was 3.36 mm. The mean difference in IJV CSA recorded by CD and IVUS was –11.2 mm^2. JEM recorded by IVUS were detected by CD sonography and CV with 88% and 32% accuracy, respectively.

Conclusions: CV was significantly inferior to CD sonography and IVUS in detecting JEM. Differences between IVUS and CD sonography in detecting JEM and in quantifying jugular diameters were not significant. The IJV CSA was underestimated by CD sonography compared with IVUS. CD sonography was proven to be important in the anatomical characterization of CCSVI, providing useful information for correct intravascular treatment.

Keywords: CCSVI, intravascular ultrasound, multiple sclerosis, jugular vein, angioplasty.

Phlebology 2013;28(8):409-17.

Original article

Implementation of a fast-track-pathway including analgo-sedation with local anaesthesia for outpatient varicose vein surgery: a cohort study.

Licker M.[1,2], Brandao-Farinelli E.[1], Cartier V.[1], Gemayel G.[3], Christenson J. T.[2,3]

1. Department of Anaesthesiology, Pharmacology and Intensive Care, University Hospitals of Geneva. 2. Faculty of Medicine, University of Geneva.
3. Department of Cardiovascular Surgery, University Hospitals of Geneva.

Abstract:

Objective: To evaluate the clinical and economical impact of a fast-track anaesthesia protocol in the management of primary varicose vein (VV) surgery.

Methods: Over a 10-month period (from 1 December 2009 to 30 September 2011), all patients eligible for open VV surgery ($N = 176$) were enrolled in a fast-track clinical pathway including titrated analgo-sedation combined with local anaesthesia. This fast-track cohort was compared with a historical cohort undergoing similar procedures and receiving general anaesthesia (GA) or spinal anaesthesia (SA) (between 1 December 2009 to 30 September 2011, $N = 200$). The length of stay in the operating facilities and postoperative recovery areas were reported and hospital costs were estimated. In addition, the occurrence of adverse events and unplanned hospital admission were compared between the two consecutive periods.

Results: Patients characteristics and surgical procedure were not different in the two cohorts. After implementation of the fast-track pathway, the incidence of postoperative adverse events decreased from 41% to 2.3%, with no need for overnight hospital stay (0% versus 7%). The reduction in anaesthesia-controlled time (–47%) and in postoperative recovery time (–61%) were associated with an increased operating capacity (1 extra case per day) and with substantial cost-savings (mean reduction of €312 per case, $P < 0.001$).

Conclusions: Implementation of a fast-track pathway for outpatient VV surgery was successful, safe and efficient. Analgo-sedation combined with infiltrative anaesthesia (instead of GA or SA) contributed to increase the operating capacity and to reduce the workload of nursing personnel.

Keywords: analgo-sedation, postanaesthesia care unit, fast-track surgery, costs, varicose vein surgery.

Phlebology 2013;28(8):418-25.

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Original article

Underlying deep venous abnormalities in patients with unilateral chronic venous disease.

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3. Academic Section of Vascular Surgery, Department of Surgery & Cancer, Imperial College London, London, UK.

Abstract: **Objectives:** To report our initial experience using direct multidetector computed tomography venography (MDCT-V) for imaging lower limb deep veins. CT findings in limbs with chronic venous disease (CVD) were compared with contralateral healthy limbs.
Methods: MDCT-V with bilateral direct pedal injection of contrast was used to image the deep veins in both lower limbs. Eight patients with unilateral lower limb CVD of varying severity (according to the Clinico-Etiological-Anatomical and Pathological classification [CEAP] class 2-6) were studied. Five patients had primary CVD, while three patients had CVD secondary to previous deep vein thrombosis.
Results: Deep venous obstruction (.50%) or occlusion was identified in all CVD limbs and was not seen in contralateral healthy limbs. These lesions were not only iliac, were not exclusively present in advanced CVD and were independent of the presence or absence of deep venous reflux.
Conclusion: Morphologically significant lesions could be underlying in patients with clinically significant CVD. Direct MDCT-V provides clear reconstructable cross-sectional images of the whole deep venous tree, including infrainguinal areas, beyond the reach of intravascular ultrasound. Utilization of new venous imaging modalities may uncover previously undiagnosed and potentially treatable venous pathology in patients with CVD.

Keywords: venous outflow, venous obstruction, venous stenosis, computed tomography, venography, CTV, MDCT-V.

Phlebology 2013;28(8):426-31.

Review article

Spontaneous plantar vein thrombosis: state of the art.

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3. Vascular Surgery Department, Henri Mondor Hospital, Paris, France.

Abstract: We aim here to highlight the importance of diagnosing and treating promptly the rarely thought of diagnosis of plantar vein thrombosis. We hereby report two cases with no known thrombotic risk factors. Less than 20 cases are reported in the literature. Detection of this unusual site of involvement of the deep venous system can be easily made by ultrasound examination if searched for. Plantar vein thrombosis is a rarely evoked pathology. Knowledge of its occurrence could further improve its diagnosis especially that it could reveal an unknown neoplasia or coagulation abnormality.

Keywords: venous thrombosis, plantar veins, plantar foot pain, vascular ultrasonography, coagulation disorders.

Phlebology 2013;28(8):432-7.

Short report

Early arteriovenous fistula after radiofrequency ablation of long saphenous vein.

Ahmad A., Sajjanshetty M., Mandal A., Hamilton H.

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Abstract: A 75-year-old woman developed an arteriovenous fistula (AVF) between the common femoral artery and common femoral vein following radiofrequency ablation (RFA) of left long saphenous vein. Failed coil embolization of the AVF was followed by successful surgical ligation. Awareness of the aetiology of this uncommon complication of RFA and its treatment options is important with the increasing use of RFA for varicose vein treatment.

Keywords: radiofrequency ablation, complications, surgery, AVF.

Phlebology 2013;28(8):438-40.

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Short report

Acute and chronic consequences of polidocanol foam injection in the lung in experimental animals.

Grandi L., Grandi R. A., Tomasi C. D., da Rocha J. L., Cardoso V., Dal-Pizzol F.

Laboratório de Fisiopatologia Experimental, PPGCS, UNASAU, Universidade do Extremo Sul Catarinense, Criciúma, SC, 88806-000, Brazil.

Abstract:

Objective: To assess the presence of pulmonary embolism and inflammation after polidocanol foam injection into the peripheral veins of rabbits.
Method: The animals were treated with polidocanol foam (1 or 3 mg/kg) or vehicle. Early (15 minutes) and late (30 days) animals were evaluated by perfusional lung scintigraphy and histopathological examination.
Results: In the control group no alterations were found. After polidocanol foam injection it was observed that an important reduction of pulmonary perfusion in the early periods, was mainly in the left lung ($P < 0.001$), with consequent embolism in the histological evaluation. In late periods it was observed that the presence of thrombus was with fibrin in small veins, compatible with chronic thrombus and the presence of chronic pulmonary inflammation.
Conclusions: The injection of polidocanol foam in experimental animals can induce venous embolism and chronic inflammatory infiltration.

Keywords: chronic venous insufficiency, polidocanol foam, venous thromboembolism.

Phlebology 2013;28(8):441-4.

Selected Phlebology Abstracts

Hemodynamics of "critical" venous stenosis and stent treatment.

Raju S., Kirk O., Davis M., Olivier J.

J. Vasc. Surg. Venous Lym. Dis. 2013:1-8.

Many venous symptoms and microvascular injury are related to venous hypertension. The group from Mississippi studied the effect of venous stenosis on upstream pressure using a mechanical model and with clinical measurements after stenting of iliac vein segments. The experimental model consisted of a Starling Resistor e Penrose tubing enclosed in a pressurized plastic chamber to simulate abdominal venous flow. Clinical measurements included time-averaged velocity, area, rate of flow, and quantified phasic flow volume in the common femoral vein before and after iliac vein stenting. Traditional air plethysmography and occlusion plethysmography were also performed. The mechanical model showed that upstream pressure varied based on (1) volume of venous inflow, (2) abdominal pressure, (3) outflow pressure, and (4) outflow stenosis. Upstream pressure changes were inverse to flow as kinetic energy was converted to pressure as required. A venous stenosis of as little as 10% raised upstream pressure in the model when the abdominal pressure was low, but high grades of stenosis had no contribution when abdominal pressure was high. Stenting of the Penrose moderated or nullified upstream pressure changes related to abdominal pressure. There was significant decompression of the common femoral vein, implying pressure reduction after stenting; median area reduction was 15% and 10% in erect and supine, respectively. Air plethysmography showed improvement in venous volume and in other parameters in confirmation of venous decompression. There was significant prolongation of phasic flow duration and quantitative phasic flow increased (median, 16%) after stenting in the erect position. There was no increase in arterial inflow. The authors concluded that the criticality of iliac vein stenosis is based on peripheral venous hypertension, which is controlled by more confounding factors than in arterial stenosis. Clinical measurements indicate that iliac vein stenting results in decompression of the limb veins and, by inference, a reduction in venous pressure. Venous flow is improved and the venous flow changes are likely the result of rearrangement of the velocity and pressure.

Phlebology 2013;28(8):445-7.

Compression of left common iliac vein is independently associated with left-sided deep vein thrombosis.

Chen F., Den J., Yuan Q.W., Zhou W.M., Xiong J.X., Zhou W.

J. Vasc. Surg. Venous Lym. Dis. 2013: 1-6.

The investigation evaluated and compared left common iliac vein (LCIV) compression in unilateral deep vein thrombosis (DVT) patients with the normal population and investigated the association of LCIV compression with the risk of left-sided DVT. A retrospective analysis of records and computed tomography imaging was conducted in 19 right DVT, 60 left DVT, and 218 control subjects. The influences of LCIV diameter and stenosis on the risk of left DVT were investigated using logistic regression analysis. In control subjects, 51.8% had greater than 50% compression of the LCIV and 24.3% had greater than 70% compression. Mean LCIV diameter was smaller in left DVT (2.39mm) than in right DVT (6.18mm) or normal control (5.39 mm). Mean LCIV stenosis was higher in left DVT (77.57%) than in right DVT (38.01%) or normal control (49.31%). With LCIV stenosis > 75%, the risk of left DVT was associated with an 11-fold increase, and with LCIV diameter < 2.5mm, the risk was associated with a 13.5-fold increase.

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Unprovoked and provoked left DVT patients had similar LCIV compression, and left DVT patients had more significant LCIV compression than right DVT patients. The investigators concluded that LCIV compression might be the essential and prerequisite factor for left DVT. Patients with severe LCIV compression should receive more emphasis on left DVT prophylaxis.

Phlebology 2013;28(8):445-7.

Deep venous reflux definitions and associated clinical and physiological significance.

Lim K.H., Hill G., Tarr G., van Rij A.

J. Vasc. Surg. Venous Lym. Dis. 2013: 1-8.

This study looked at the extent of deep venous reflux (DVR) that must occur for it to be clinically and hemodynamically important – while controlling for the presence of superficial reflux. This was a cross-sectional study of 3122 limbs from 2349 subjects, using a prospectively designed data set obtained from duplex ultrasound assessment, CEAP clinical class, and venous filling index (VFI). A classification of axial DVR is described, based on the level of continuous reflux occurring in the vertical axis as detected by duplex ultrasound: axial 0 (no deep reflux), axial 1 (common femoral vein only), axial 2 (to any level of the femoral vein), axial 3 (to the level of the popliteal vein), and axial 4 (into the calf veins). The authors found that limbs with increasing axial level were more likely to have CEAP 4–6 (axial 0: 294 [37.2%]; axial 1: 520 [41.6%]; axial 2: 82 [41.2%]; axial 3: 92 [59.7%]; axial 4: 148 [64.9%], *P* value for trend < .0001). This relationship remained highly significant following adjustment for superficial reflux and demographic variables. Compared with limbs with no DVR, the adjusted odds ratio for having CEAP 4–6 was 2.10 (1.25–3.51; *P* < .0048) for limbs with axial level 3 and 3.07 (1.94–4.88, *P* < .0001) for limbs with axial level 4. Similarly, after adjustment, predicted mL/s increases in VFI were significant (*P* < .0001) for level 1 (1.19 [1.08– 1.31]), level 3 (1.53 [1.31–1.78]), and level 4 (1.74 [1.51– 1.95]). The conclusion was that deep axial reflux to the level of the knee and calf is associated with more severe venous disease and greater VFI, independently of reflux in the superficial system; segmental reflux, when extensive, also contributed to the risk of more severe disease.

Phlebology 2013;28(8):445-7.

Complications of endovenous ablation in randomized controlled trials.

Dermody M., O'Donnell T.F., Balk E.M.

J. Vasc. Surg. Venous Lym. Dis. 2013: 1–11

Several randomized controlled trials (RCTs) have reported data on efficacy of the ablation with little focus on complications. The authors analyzed the current literature for short-term complications of EVA as compared with L&S. A literature search was performed from 2008 to 2013 for RCTs comparing RFA and/or EVLA and/or L&S to treat GSV incompetence. Excluded were studies using foam sclerotherapy, re-do GSV surgery, or the addition of a high GSV ligation to an EVA procedure. Seventeen RCTs met inclusion criteria. There were 317 patients who underwent segmental-pullback RFA, 1057 patients who had EVLA, and 975 who had L&S. The majority had CEAP clinical class 2 or 3. There was an overall complication rate of 39.6% in the 2624 limbs analyzed over all procedures. There was no evidence of a difference in the rates of venous thromboembolism. There was a significantly higher rate of wound infection for L&S (2.3%; 95% confidence interval [CI], 1.3–3.1%) vs. EVLA (0.5%; 95% CI, 0.3–1.3%; *P* < .006), but not between L&S and RFA (1.5%; 95% CI, 0.4– 3.0%; *P* < .094). The paresthesia rate was significantly lower with EVLA (3.8%; 95% CI, 2.4–4.5%) as compared with RFA (5.2%; 95% CI, 3.1–7.9%; *P* < .001) and L&S (7.4%; 95% CI, 5.3–8.3%; *P* < .001). The rate of thrombophlebitis was significantly lower for L&S (3.0%; 95% CI, 2.9–4.0%) as compared with RFA (5.5%; 95% CI, 3.0–7.8%; *P* < .003) and EVLA (5.6%; 95% CI, 4.2–7.0%; *P* < .003). There was no difference in the rate of thermal skin burns between RFA and EVLA. They concluded that L&S has a higher wound infection rate and a lower thrombophlebitis rate as compared with EVA. EVLA has a significantly lower rate of paresthesia as compared with RFA and L&S. Thermal skin burns occur with equal frequency in RFA and EVLA.

Phlebology 2013;28(8):445-7.

Steam ablation versus radiofrequency and laser ablation: An in vivo histological comparative trial.

Thomis S., Verbrugghe P., Milleret R., Verbeken E., Fourneau I., Herijgers P.

Eur. J. Vasc. Endovasc. Surg. 2013

Twelve saphenous veins in six goats were treated with radiofrequency, laser or steam/vapor. Seven days after treatment, occlusion and diameter changes were evaluated and histological changes were examined microscopically. Vein length, mean diameter, and the amount of tumescence were comparable between the three groups. Histological examination showed extensive vein wall destruction, the least in the outer layer of the vein wall. The total vein wall damage was 9.2/15 (SD 3.5) for EVLA, 13.3/15 (SD 3.3) for RFA, and 11.2/15 (SD 2.8) for SVS group. There was no significant difference among the three groups. Perivenous tissue damage was low. No extrafascial damage was seen.
The authors conclude that histological findings after steam ablation are similar to the RFA and EVLA with low perivenous tissue destruction and high vein wall destruction.

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Deep vein thrombosis and/or pulmonary embolism concurrent with superficial vein thrombosis of the legs: Cross-sectional single center study of prevalence and risk factors.

Hirmerova J., Seidlerova J., Subrt I.

Int. Angiol. 2013;32:410-6.

In sum, 138 vascular clinic patients, average age 61.4, with SVT (90% varicose veins) underwent physical examination, laboratory testing and leg vein ultrasound (in the case of clinically suspected PE also perfusion/ventilation lung scan or/and helical CT pulmonary angiography). The prevalence of concurrent DVT/PE was 34.1%. Neither the clinical manifestation nor SVT localization differed significantly between the group with isolated SVT and that with coincident DVT/PE. Log BMI was significantly higher in the patients with isolated SVT. Ages, sex, BMI, history of SVT, DVT, PE, hypercoagulable states, cardiovascular risk factors were not statistically significant.
The authors identified that lower BMI (log BMI, respectively) and the presence of FVL were significantly and independently associated with concurrent DVT/PE. In addition, the authors stated that their results should be further investigated in a larger prospective study.

Phlebology 2013;28(8):445-7.

Healing process of venous ulcers: The role of microcirculation.

Ambrózy E., Waczulíková I., Willfort A., Böhler K., Cauza K., Ehringer H., Heinz G., Koppensteiner R., Maric S., Gschwandtner M.E.

Int. Wound J. 2013;10: 57-64.

The authors investigated 10 venous ulcers in three consecutive clinical stages of wound healing: non granulation tissue (NGTA), granulation tissue (GTA) and cicatrix. Subpapillary microcirculation was measured by laser Doppler perfusion (LDP) imaging and expressed using LDP values in arbitrary units. Nutritive perfusion by capillary microscopy and expressed as capillary density (CD) – the number of capillaries per square millimeter. Before the development of GTA, the LDP was low (median 1.35; lower–upper quartiles 0.71–1.83) accompanied with zero CD in all but one patient who had a density of 1. With the first appearance of GTA in the same area, the LDP was improved (2.22; 1.12–2.33; $P = 0.0024$) when compared with NGTA, in combination with a significant increase in CD (1.75; 0–3; $P = 0.0054$). In scar, the LDP was similar to that in the NGTA (1.03; 0.77–1.83; $P = 0.278$), combined with the highest CD (5.75; 4.5–8) in comparison with the previous stages of the area (for both pairs, $P < 0.0001$).
The authors state that venous ulcers are caused by poor nutritive and subpapillary perfusion. In addition, papillary perfusion plays a significant role in the formation of GTA. In a cicatrix, the increased nutritive perfusion is sufficient to cover the blood supply and keep skin viable while subpapillary perfusion is low.

Phlebology 2013;28(8):445-7.

A case of fatal iliac vein rupture associated with May-Thurner Syndrome.

Hughes R.L., Collins K.A., Sullivan K.E.

Am. J. Forensic Med. Pathol. 2013

The authors report a case of deep venous thrombosis (DVT) in a woman with previously undiagnosed May–Thurner syndrome and heterozygosity for factor V Leiden mutation on exogenous hormone therapy, with subsequent spontaneous rupture of the left common iliac vein (LCIV) leading to fatal hemoperitoneum. May–Thurner syndrome is attributed to long-standing compression of the LCIV and is characterized by the formation of intraluminal spurs leading to obstruction of blood flow and DVT. The authors state that increased intraluminal pressures may occur as a consequence of venous obstruction, which when coupled with other factors are thought to further weaken venous wall integrity (i.e., inflammation or hormonal imbalances); this may produce spontaneous (non-traumatic) and potential lethal venous rupture. Autopsy revealed fibrous obliteration of the junction between the LCIV and inferior vena cava with associated DVT, transmural venous rupture, and thrombophlebitis.

Phlebology 2013;28(8):445-7.

Kabnick L., Almeida J.