

Review and commentary of key non-JVS-VL articles

Is copper a miracle agent?

Impact of Copper Compression Stockings on Venous Insufficiency and Lipodermatosclerosis: A Randomised Controlled Trial



Arendsen LP, Vig S, Thakar R, Sultan AH. *Phlebology* 2018 Aug 27. [Epub ahead of print]

Conclusions: Copper can now be impregnated into any sock, bandage, or wrap. However, copper-infused compression stockings did not improve symptoms in patients with chronic venous insufficiency (CVD) and lipodermatosclerosis (LDS) compared with noncopper stockings.

Summary: LDS is a late manifestation of CVD insufficiency involving cellulitis, hyperpigmentation, induration, and constricted skin and is associated with a higher risk of ulceration. Both the United States and the United Kingdom (through its National Health Service) spend millions of dollars on the care and treatment of venous ulcers, with patients losing work days as well. This study investigated the utility of copper-impregnated compression stockings in patients with LDS and CVD. Eighteen patients with bilateral severe (C4-C6) CVD wore stockings in which each pair contained one stocking with 2% to 3% copper oxide ions and one was nylon only, with left and right legs randomized. Both patients and physicians were blinded as to which side was the copper-infused stocking. Venous scoring and wound measurement tools were used to document baseline symptoms and outcomes. After 2 weeks, the surface area of the affected skin was significantly reduced in the copper group, but there was no difference in symptoms at 8 weeks.

Comments: Is copper a miracle element? The antimicrobial properties of copper are known, but in this study, copper-impregnated stockings failed to significantly improve CVD symptoms compared with plain stockings. Perhaps any improvements were due to compliance with compression alone.

Can you see me now? Deep venous thrombosis imaging guidelines

Ultrasound for Lower Extremity Deep Venous Thrombosis: Multidisciplinary Recommendations From the Society of Radiologists in Ultrasound Consensus Conference



Needleman L, Cronan JJ, Lilly MP, Merli GJ, Adhikari S, Hertzberg BS, et al. *Circulation* 2018;137:1505-15.

Conclusions: Standardized testing and reporting will improve diagnosis, treatment, and follow-up of patients with suspected deep venous thrombosis.

Summary: A multidisciplinary group of experts, sponsored through the Society of Radiologists in Ultrasound, evaluated ultrasound protocols for deep venous thrombosis and proposed these guidelines for standardized point-of-care testing and terminology. These recommendations streamline the protocols yet provide a comprehensive scanning practice and improve capture of calf vein thrombi. Consistent terminology is recommended.

Comments: This panel recommends a comprehensive duplex ultrasound protocol from thigh to ankle with Doppler interrogation at selected sites rather than a limited or complete compression-only examination. What is fabulous about these recommendations is that the protocol is not new; it is performed at many facilities and does not require capital investments or training. This protocol can be performed by standard ultrasound equipment and personnel.

Is all reflux considered equal?

Vein Size and Disease Severity in Chronic Venous Diseases



Radhakrishnan N, George D, Jayakrishnan R, Sumi S, Kartha CC. *Int J Angiol* 2018;27:185-9.

Conclusions: Given the prevalence of chronic venous insufficiency and frequency of interventions, defining criteria and indications for those who may benefit most is key.

Summary: This is a retrospective study of >6300 patients who were reviewed for demographics and risk factors, specifically the correlation between vein diameter and symptom severity. Almost 47% of patients were assigned to C3 or higher classification. Interestingly, patients who had varicose veins and smaller diameter superficial veins had 2.85-fold more risk of edema and 5.71-fold higher prevalence of hyperpigmentation compared with patients who had varicosities associated with truncal reflux. Varicosities in small superficial veins were associated with higher risk of ulceration (odds ratio, 3.93; 95% confidence interval, 2.51-6.18) compared with truncal vein reflux.

Comments: This study is worth a read and paying attention to small refluxing superficial veins. These authors point out that physicians need not only to look at the larger truncal veins but also to pay attention to the contribution of the smaller (<4 mm) diameter superficial veins and their contribution to more severe venous disease.

Excellence in ultrasound screening for deep venous thrombosis

The Prevalence of Chronic Deep Venous Thrombosis in Trauma: Implications for Hospitals and Patients



Cannon KA, Badiie J, Wallace J, Brill JB, Sise MJ, Bansal V, et al. *J Trauma Acute Care Surg* 2018;84:170-4.

Conclusions: Up to 30% of deep venous thrombosis (DVT) found in trauma patients can be classified as chronic in nature. This has financial as well as risk and prophylactic implications for health care systems, clinicians, and patients.

Summary: This is a single-center retrospective review of 10 years of trauma patients with a >48-hour hospital stay that triggers lower extremity duplex ultrasound screening for DVT. Patients with DVT on initial lower extremity duplex ultrasound examination underwent review of the images to assess clot chronicity by standard imaging criteria. Chronic DVT was found in 30% of patients who were older and less severely injured than those with acute DVT; however, only 40% reported a history of DVT. This cohort had 9% incidence of thrombus progression and a 14% rate of new DVT formation.

Comments: At high-volume trauma centers, a screening ultrasound examination of every admission during 48 hours would be labor intensive. However, the authors make many good points, especially in use of the distinguishing criteria between acute and chronic clot so that patients can be treated and appropriately counseled. Furthermore, hospitals then are not penalized for old, nonpreventable DVT that the patients themselves did not know about or report.

The implications of a long life expectancy in the catheter-directed thrombolysis decision-making tree

Results of Catheter-Directed Thrombolysis for Acute Iliofemoral Deep Venous Thrombosis—A Retrospective Cohort Study



Madsen CP, Gesla J, Vijdea RL, Serifi MA, Christensen JK, Houliind K. *JRSM Cardiovasc Dis* 2018;7:2048004018766801.

Conclusions: The efficacy of catheter-directed thrombolysis (CDT) in a small, retrospectively reviewed cohort of very young Danish patients demonstrated excellent results at 1-year follow-up, with a small percentage of patients developing post-thrombotic syndrome (PTS).

Summary: This is an observational and retrospective review of 48 patients, average age of 28 years, with iliofemoral deep venous thrombosis who underwent CDT. In this cohort, 75% were women. There was complete thrombus lysis in 43 cases and partial lysis in 2 cases; 26 stents were placed in culprit iliac venous lesions. There were no major bleeding complications and no deaths. At 1-year follow-up, 7 of 32 patients did not have evidence of PTS.

Comments: This is an usually young group of patients treated with CDT, and the study thus far has only 1 year of follow-up. Many studies have demonstrated that CDT is effective in removing thrombus, but the main question is the prevention of the long-term sequelae of PTS. The patients in this study are a selected group of young persons with potentially another 50+ years to live. The authors raise provocative questions about quality of life, longevity, and the use of CDT as a preventive measure for a possibly chronic disease.

The new frontier: Artificial intelligence and varicose veins

Clinical and Genetic Determinants of Varicose Veins: Prospective, Community-Based Study of ≈500000 Individuals



Fukaya E, Flores AM, Lindholm D, Gustafsson S, Zanetti D, Ingelsson E, et al. *Circulation* 2018 Sep 24. [Epub ahead of print]

Conclusions: This enormous epidemiologic study of almost a half-million people in the UK data repository yielded clues into the genetic biology related to varicose veins. Several genes were found that may be implicated as translational research targets.

Summary: This study used machine learning to comb through the UK Biobank, which is both a long-term study and a genetic repository that includes genomic data of almost 500,000 persons, approximately 10,000 of whom had venous disease. The results confirmed many known associations, such as age, sex, pregnancy, and history of deep