improvement in symptoms but sustained an increased complication rate. Patients with smaller vein size should not be denied intervention or coverage on the basis of size criteria.

Author Disclosures: S. Bendix: Nothing to disclose; **E. Peterson:** Nothing to disclose; **L. Kabbani:** Nothing to disclose; **M. Weaver:** Nothing to disclose; **J. Lin:** Nothing to disclose.

Unexpected Frequency and Clinical Significance of Nontarget Superficial and Deep Vein Occlusion After Foam-Form Sclerotherapy

Kirill Lobastov, Athena Vorontsova, Victor Barinov, Leonid Laberko. Department of General Surgery and Radiology, Pirogov Russian National Research Medical University

Objective: Ultrasound-guided foam-form sclerotherapy (UGFS) appears to be a safe procedure associated with a low number of clinically relevant venous thromboembolism events. However, the incidence and clinical relevance of silent occlusions of deep and superficial veins that were not a target for treatment have not been carefully studied. The aim of this study was to address this knowledge gap.

Methods: This retrospective analysis focused on the electronic medical records of patients treated with UGFS at a private clinic in Moscow between 2015 and 2017. In accordance with the internal protocol, all patients underwent serial duplex ultrasound (DUS) examination at 1 to 2 weeks and 1 month, 3 months, 6 months, and 12 months after UGFS with mandatory fixation of the results in the electronic medical record. Serial DUS was used to identify nontarget venous occlusion, recognized as incomplete compression of any deep or superficial vein not subjected to obliteration. The analysis included patients who underwent at least one DUS examination 1 to 2 weeks after UGFS.

Results: The analysis included data on 257 lower limbs of 196 patients with varicose veins: 139 women and 57 men (mean age, 44.2 ± 12.2 years) with the following Clinical, Etiology, Anatomy, and Pathophysiology (CEAP) clinical class distribution: C2, 74.0%; C3, 20.0%; C4, 4.5%; and C5, 1.5%. UGFS was performed in addition to laser ablation of the great saphenous vein in 54.9%, small saphenous vein in 10.5%, perforating veins in 26.1%, Giacomini vein in 3.9%, or anterior accessory saphenous vein in 1.9%.

Nontarget venous occlusion was detected in 60 limbs (23.3%) and was symptomatic in only three cases (1.2%). The majority of occlusions were localized in the untreated great saphenous vein trunk (n = 23) or the calf muscle veins (n = 15). Specific drug treatment was prescribed for only two patients; 91%, 66%, 37%, and 11% of all limbs were followed-up at 1 month, 3 months, 6 months, and 12 months, respectively. There were no cases of thrombus progression or symptomatic pulmonary embolism. At 6 months, no occlusions persisted. Recurrence of varicose veins at 12 months was noted in 16 cases (6.2%) by DUS. There were no differences between limbs as a function of occlusions (10.0% vs 5.1%; $P = .218$).

Conclusions: The frequency of nontarget vein occlusion after UGFS revealed by serial DUS may be as high as 23.3%. These occlusions tend to resolve by 6 months and do not affect clinical outcomes.

Author Disclosures: K. Lobastov: Nothing to disclose; **A. Vorontsova:** Nothing to disclose; **V. Barinov:** Nothing to disclose; **L. Laberko:** Nothing to disclose.

Early Results of a Randomized Clinical Trial of Mechanochemical Ablation Versus Cyanoacrylate Adhesive for the Treatment of Varicose Veins

Amjad Belramman,[1] Roshan Bootun,[1] Tjun Yip Tang,[2] **Tristan R. A. Lane,**[1] Alun H. Davies[1]. [1]Section of Vascular Surgery, Imperial College London; [2]Singapore General Hospital

Objective: Endovenous thermal ablation techniques have become the first-line treatment of truncal veins. However, these techniques use heat and have need of tumescent anesthesia, which are often associated with pain. To overcome these side effects, novel nonthermal techniques, such as mechanochemical ablation (MOCA) and cyanoacrylate embolization (CAE), have been developed; these do not require tumescence or use heat. This randomized controlled trial aimed to assess the degree of pain resulting from MOCA compared with CAE. We are herein reporting the early results of this randomized clinical trial.

Methods: Patients with saphenous vein incompetence were randomized to receive treatment with either MOCA or CAE. The primary end point is pain score immediately after completion of truncal ablation, measured by a 100-mm visual analog scale. The secondary end points include entire treatment pain scores, clinical scores, and quality of life scores. Additional assessments include ecchymosis scores, occlusion rates, and time to return to usual activities/work at 2 weeks. Patients are observed at 2 weeks, 3 months, 6 months, and 12 months.

Results: So far, 84 patients have been recruited (66% women; mean age, 56 years). The vein treated was the great saphenous vein in 86% of cases, and 51% of the cases were randomized to cyanoacrylate ablation. Both groups had similar baseline characteristics. Patients in both groups experienced similar maximum pain score by visual analog scale (CAE: median 24 mm (interquartile range [IQR], 9-45 mm); MOCA: median, 23 mm (IQR 11-49 mm); $P = .464$) and number scale (CAE: median, 3 (IQR, 1-5); MOCA: median, 3 (IQR, 2-5); $P = .333$). Average pain score was also similar between treatment groups. Eighty-three percent (70 patients) of the population attended the 2-week follow-up. Postprocedure ecchymosis score, recovery time, and clinical and quality of life scores were similar between groups.

Conclusions: The early results of this trial showed that pain score is comparable between CAE and MOCA endovenous ablation. The results also indicated similar improvement in quality of life, clinical improvement, and recovery time. Recruitment of patients is ongoing, and longer term follow-up data are currently being collected.

Author Disclosures: A. Belramman: Nothing to disclose; **R. Bootun:** Nothing to disclose; **T. Y. Tang:** Nothing to disclose; **T. R. A. Lane**: Nothing to disclose; **A.H. Davies:** Nothing to disclose.

Diagnosis of and Therapy for Vein Insufficiency in Children

Johann Chris Ragg. Interventional Phlebology, Angioclinic Vein Centers

Objective: Venous insufficiency of the lower extremities is usually considered to be a genetically determined, long-term acquired disease. Children have rarely been examined.

Methods: In an ongoing study, until May 2018, a total of 170 legs in 85 children of Angioclinic vein patients aged 6 to 18 years (38 male; 47 female) were examined with high-frequency ultrasound (Siemens X700 [Siemens Healthcare, Hoffman Estates, Ill]; Mindray M9, 14-16 MHz [Mindray, Mahwah, NJ]; Vevo MD, 16-32 MHz [SonoSite, Bothell, Wash]). Investigation time was limited to 15 minutes. In case of visible vein changes (protruding, more intense color, increased diameter), ultrasound started here. Otherwise, systematic screening of saphenous veins and medial perforators was performed.

Results: In 47 of 85 children (55.3%), relevant venous disease was found in 59 of 170 legs (34.7%), as follows: focal valvular defects of the great saphenous vein (GSV; 14/170 [8.2%]), segmental GSV reflux without varices (15/170 [8.8%]), segmental GSV reflux with varices (11/170 [6.5%]), GSV side branch reflux only (13/170 [7.6%]), total GSV reflux (3/170 [1.8%]), focal small saphenous vein valve lesion (2/170 [1.2%]), segmental small saphenous vein reflux (1/170 [0.6%]), and medial perforator reflux (none). In the subgroup of 6- to 8-year-old children, 9 of 30 legs (30.0%) already showed pathologic changes. Among the cases allowing diagnosis of lesion type (n = 53), unilateral commissural mismatch was the most frequent pattern (24/53 [45.3%]). Whereas some findings may be treated at a suitable age (14-18 years) with today's methods (side branches: microfoam; saphenous: thermal, MOCA, biomatrix foam), vein-saving methods are still missing for single-valve insufficiency and stages before clinical reflux.