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Using a Syringe Pump During MOCA: a Good Idea but Doesn't Give the Required Flexibility for Effective Truncal Ablation

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Dear Editor:

We read with interest the recent paper by Park and Kim [1] describing a useful technique of using an automatic syringe pump to help in injecting sclerosant evenly during mechanochemical ablation (MOCA) of incompetent truncal saphenous veins for chronic venous insufficiency or varicose veins using the ClariVein device (Merit Medical Systems, Inc., South Jordan, UT, USA). The authors discuss how this can help with the consistency of sclerosant injection over the length of the axial vein and allow the operator to concentrate on wire pullback and scoring of the vein endothelial lining to maximize chemical uptake, especially for those who are less experienced with the technique. We were the first group to use the device in Singapore in 2012 and have gained valuable and extensive experience using it to ablate varicose veins. This is particularly useful in our multi ethnic Asian society, where venous diseases tend to present at an advanced stage, and the veins tend to be smaller in diameter with longer lengths of truncal reflux than Caucasian counterparts [2].

We have published our series of 121 patients in 2018, showing that it has an excellent safety profile with few associated complications, high technical success (100%), and early saphenous vein occlusion rates [3]. However, anatomical recurrence was more than expected at 1 year (approximately 15%) and, although disappointing, was tempered by the fact that most patients were clinically asymptomatic and required no reintervention. Longer-term data on MOCA are generally lacking, and it is therefore not recommended as first-line treatment in both the UK *National Institute of Health and Clinical Excellence* (NICE) and the *Society for Vascular Surgery/American Venous Forum* guidelines [4,5].

We had previously attempted using an automatic syringe pump system to deliver the sclerosant in an even-handed fashion, as the authors have described, but failed to continue practicing this technique. In cases of the great saphenous vein (GSV) or small saphenous vein (SSV) with a small straight diameter (<7 mm), this technique can be used to allow more consistent dispersal of 0.2 mL of sclerosant per cm of wire pullback in 7 to 8 seconds. However, for truncal veins that are large in diameter (>10 mm), thick, and with aneurysmal varices along its course, the technique requires the operator to linger with the device for a longer duration in those areas to allow mechanical constriction and more abrasion time of the wire against the vein wall to facilitate more effective uptake of the sclerosant. More chemicals are usually injected into these areas during pullback. Another area in the GSV where the device needs to stay longer during ablation is around the knee region. Anatomical recurrence reported in our initial Singaporean cohort occurred within the GSV around the proximal thigh and knee regions [3]. We suspected that this might be a consequence of the repeated flexion/extension motion of the hip and knee joints, respectively, which may re-open the truncal vein mechanically. We have subsequently modified our approach to include a slower pullback of the catheter around these

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areas to allow maximal vein scouring with the injection of more quantities of sclerosant/higher concentration to expedite vein occlusion.

Furthermore, it is imperative to create a vortex initially at the sapheno-femoral junction for GSV and sapheno-popliteal junction for SSV, causing vasoconstriction and minimizing the risk of sclerosant and thrombus entering the deep system. The "Instructions for Use" of the device state that there should be no sclerosant injected for the first 3 cm of the wire pullback, which would make pump use more difficult. We switched between using 2% and 3% sodium tetradecyl sulfate (STS) concentrations (Fibrovein; STD Pharmaceutical Products Ltd., Hereford, UK) for different GSV and SSV diameters encountered down the leg to allow more effective ablation. Hence, even with the pump, the pullback speed should not be constant but manually adjusted depending on the vein type. Another useful method that can be employed is to allow more permeation of the sclerosant directly into the side branches or varicosities of the main truncal vein. This requires more sclerosant injection quantities at these points, which can be easily performed by direct thumb injection rather than using a pump device. This is a technique in which the senior author (TYT) has subsequently taken across to the the endovenous arena where cyanoacrylate glue embolization was performed by attempting to milk sclerosant/glue into the side branches to minimize the number of concomitant phlebectomy to be performed later [6]. The recommended maximum single treatment dose of STS should not exceed 10 mL of 3% strength [7]. A 10 mL treatment with 3% STS delivers a total dose of 300 mg. An equivalent dose of 2% STS would enable 15 mL to be used. This is enough to treat several truncal veins in one sitting and allow some of the varicosities to be occluded using this technique.

In conclusion, we believe that ClariVein should be performed as a manual procedure using hand-eye coordination of the surgeon to judge simultaneous pullback of the catheter and injection of sclerosant. It allows better adaptation to what is needed for the truncal vein at different positions on the leg.

CONFLICTS OF INTEREST

The senior author (TYT) was previously a certified proctor for the previous owners of the ClariVein device (Vascular Insights LLC, Quincy, MA, USA) and is currently a key opinion leader for Merit Medical in Southeast Asia.

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