

Retrograde endovenous laser ablation of the great saphenous vein using the superficial inferior epigastric vein as access vessel illustrated by a case report

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Abstract

Endovenous thermal ablation is a first-line treatment for symptomatic varicose veins due to truncal vein reflux. Ablation of an incompetent great saphenous vein is usually performed from distally, with the vein access at the lowest point of reflux, or just below the knee. Occasionally there are patients in whom the great saphenous vein is difficult to access distally for reasons such as small vein diameter, scar tissue, vasospasm, difficult anatomy or multiple attempts with haematoma formation. In such cases, we access the great saphenous vein in a retrograde fashion by percutaneous cannulation of the superficial inferior epigastric vein, passing the catheter into the great saphenous vein just distal to the saphenofemoral junction and then down the vein to the required distal position. Ablation can then be performed, stopping the ablation in the great saphenous vein just distal to the junction of superficial inferior epigastric vein and great saphenous vein. We present a patient to illustrate our technique.

Keywords

Retrograde, endovenous ablation, great saphenous vein

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Introduction

Endovenous thermal ablation techniques have been recommended as the first-line treatment for varicose veins due to truncal vein reflux in the United Kingdom,¹ Europe² and the United States.³ Catheter-based endovenous ablation techniques to close the great saphenous vein (GSV) are usually performed by gaining access to the vein distally and passing the catheter up the GSV under ultrasound control. Ablation usually starts near the top of the vein, with the catheter being withdrawn at a set speed distally.

On occasion, this approach is difficult or impossible due to problems such as a small vein, scar tissue, vasospasm, difficult anatomy or multiple attempts with haematoma formation.

Although uncommon, in such cases we can often gain access to the GSV by percutaneous ultrasound guided cannulation of the ipsilateral superficial inferior epigastric vein (SIEV), passing the catheter distally, directly into the proximal GSV and then distally down the incompetent truncal vein. This technique has proven to be a useful alternative technique to accessing the GSV in these trying situations and

is an easier technique than some that have been suggested previously.

Case

A 41-year-old woman presented with left leg primary varicose veins with skin changes, discolouration around the ankle and venous eczema (CEAP C4). The patient had no history of deep vein thrombosis or pulmonary embolism. Venous duplex ultrasonography revealed gross reflux in a large incompetent GSV with a diameter of 8 mm. We recommended left endovenous laser ablation (EVLA) of the GSV

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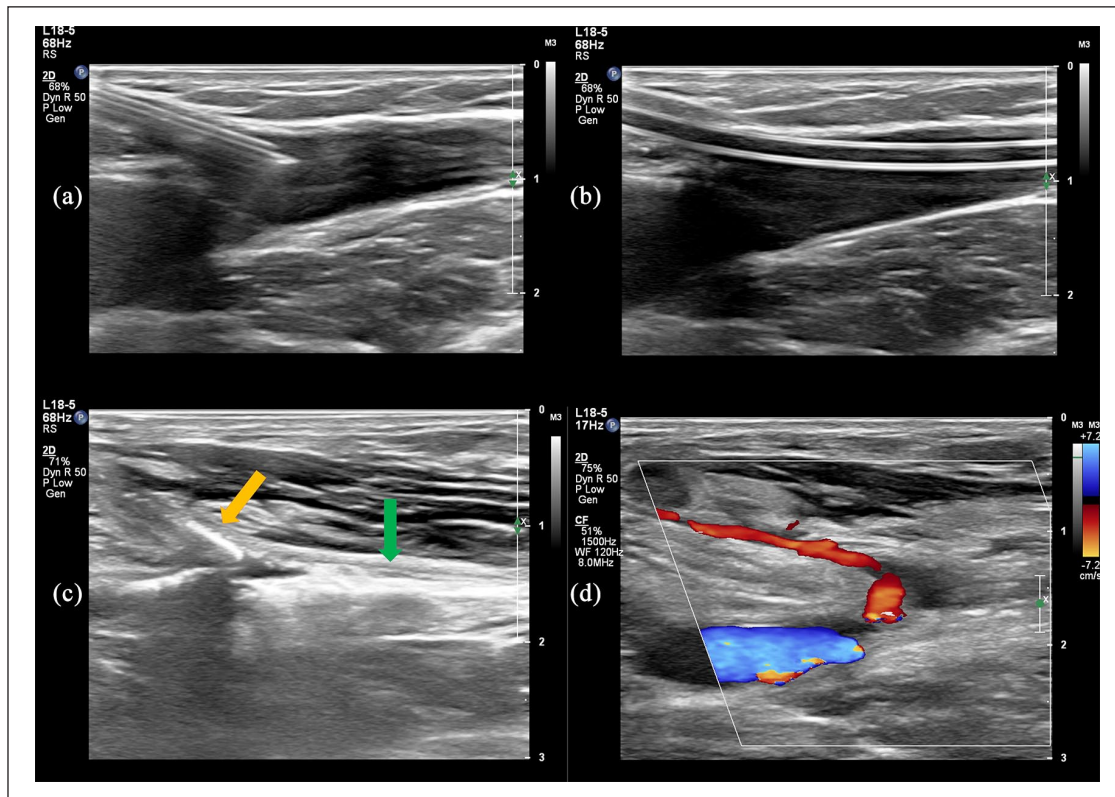


Figure 1. A sequence of ultrasound images captured during the procedure. (a) shows the insertion of a micro-puncture needle down the superficial inferior epigastric vein and into the proximal great saphenous vein (GSV). (b) shows the sheath being passed through the GSV. (c) demonstrates the laser ablating the vein from distal to proximal – green arrow ablation of GSV stopping at junction of GSV and SIEV, yellow arrow SIEV left untreated. (d) shows existing flow in the common femoral vein and superficial inferior epigastric vein, but elimination of flow in the GSV.

and phlebectomies. The patient agreed and consented to the procedure.

At operation, the patient was placed in the ‘head up’ reverse Trendelenburg position to dilate the veins ready for cannulation. However, difficulties were encountered when attempting to access the GSV distally, resulting in haematoma and venous spasm. Therefore, the decision was made to access the vein in a retrograde fashion.

Care was taken to ensure that the lower abdomen on the left side was exposed, allowing easy access to the SIEV. The SIEV was cannulated by means of a longitudinal approach using a transducer with a narrow Z-axis (Philips EPIQ 5G Ultrasound System, Philips Healthcare, USA). Once cannulated, a normal Seldinger approach was used, with the wire being passed through the micro-puncture needle, down the SIEV and into the proximal GSV. A dilator and sheath was passed as normal followed by the endovenous device (Figure 1).

The endovenous laser was passed distally down the vein in a retrograde fashion to the below knee GSV, where we would usually access the vein in normal circumstances. Once positioned, the patient was tipped into the Trendelenburg (head down) position and tumescence was injected around

the vein under ultrasound guidance. Ablation was performed from distal to proximal, and an ultrasound was used to check when the tip approached the junction of the SIEV and GSV. Ablation stopped at this point. The immediate results of ablation mirror those found at 2 weeks (Figure 2) – ablation of the GSV and short stump with flow from the SIEV.

Discussion

Catheter-based endovenous ablation techniques, both thermal and non-thermal, require endovenous cannulation and passage of the catheter along the target vein. All these ablation techniques then ablate the vein during the withdrawal of the endovenous device.

In most patients, an antegrade approach can be used, with percutaneous cannulation of the target GSV or small saphenous vein (SSV) distally. However, there are uncommon occasions when the distal access of the vein is difficult or impossible. Venous spasm alone can be addressed by using a local topical vasodilator⁴ and techniques such as the double pre-puncture technique can be used when the vein is accessible but too tortuous for catheter passage.⁵

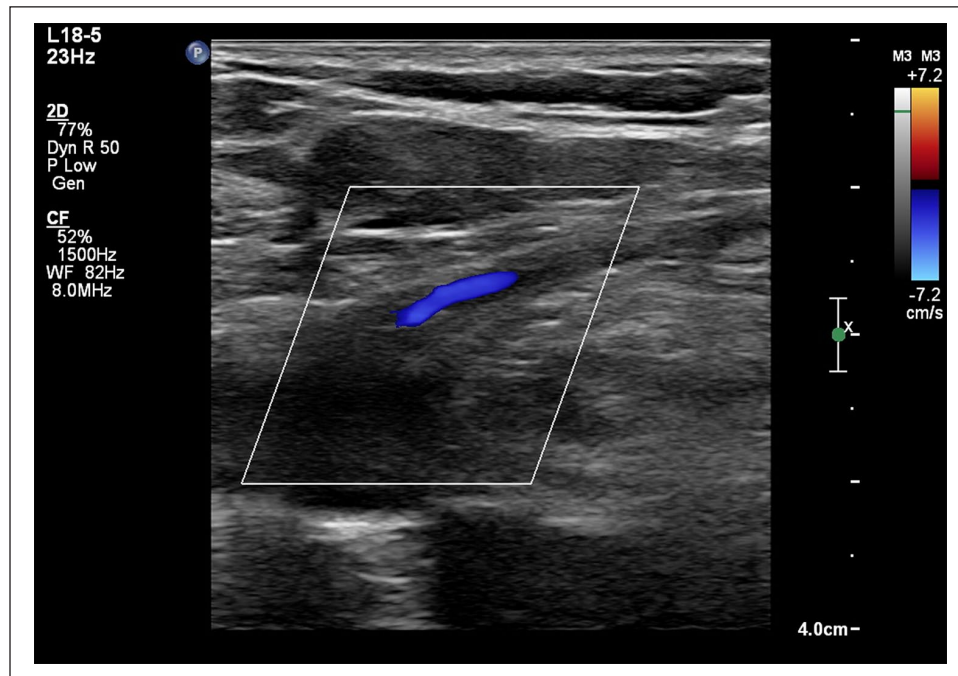


Figure 2. Figure demonstrating flow is not compromised in the common femoral vein and has been eliminated in the great saphenous vein at 2 weeks post-ablation.

Retrograde approaches have been suggested for the SSV^{6,7} and for the distal GSV when there is hostile tissue preventing the usual antegrade approach.⁸

Several authors have found occasions when the GSV cannot be cannulated in an antegrade fashion. In such cases, a retrograde approach to the GSV either via a contralateral approach from the contralateral femoral vein,⁹⁻¹¹ or by a direct approach cannulating the GSV 1 to 2 cm below the saphenofemoral junction (SFJ),¹¹ have been reported to have been successful.

However, these retrograde approaches either require a catheter to be guided across the iliac bifurcation in the first technique or leave a section of proximal GSV untreatable in the second.

We have found that a retrograde approach, using the ipsilateral SIEV, easy to use with either a forward firing laser (jacket tip) or a radial laser. However, despite doing over 1,000 cases per year, we have only had occasion to need to do this in a handful of cases. With either device, it is possible to close the GSV very close or flush to the junction of SIEV and GSV simply by following the above technique. Occasionally, the SIEV can be a little tortuous, but we have found that cranial traction with one hand on the anterior abdominal wall straightens the vein sufficiently to pass wire and then catheter through it.

This approach is very useful in patients in whom the GSV is difficult to access distally for reason such as small vein, spasm, difficult anatomy including skin scarring from burns in one case, or multiple failed attempts of cannulation with haematoma formation. However, we have also

found that because we are able to ablate up to the junction of the SIEV and GSV, this takes away the concern of being too close to the SFJ and potential damage of the common femoral vein or being too far away from the SFJ and the possibility of leaving a long stump which might allow thrombus to develop (an endovenous heat induced thrombus or 'EHIT'). We usually find that the SIEV remains patent, flushing normally flowing venous blood through the SFJ, reducing the risk of any EHIT.¹²

Conclusion

We have presented a case to illustrate a retrograde technique to ablate the GSV, using the SIEV as the access vessel. We have found this technique useful in patients where the usual antegrade approach is impossible or difficult, with advantages over the previously described retrograde approaches to the GSV. However, the good post-operative results we have seen on duplex ultrasound scan, and the ease at which we can be sure that the top of the ablation is neither too close nor too far from the SFJ, is leading us to consider this as our routine approach to EVLA of the GSV.

Authors' note

This case and technique were presented at the UIP in Melbourne, January 2018.

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Ethical approval

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Informed consent

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