

CASE REPORTS

Cyanoacrylate glue for the treatment of great saphenous vein incompetence in the anticoagulated patient

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The Sapheon Venaseal Closure System (Sapheon Inc, Santa Rosa, Calif), using cyanoacrylate glue, has provided a new modality of treatment, with patients treated without both tumescent anesthesia and postoperative compression. We present the first case of great saphenous vein occlusion

performed using glue while the patient was fully anticoagulated with warfarin. This was tolerated well, and the treated vein showed complete early occlusion at 8 weeks; however at 6 months, extensive recanalization was demonstrated on duplex imaging. (*J Vasc Surg: Venous and Lym Dis* 2013;1:298-300.)

Varicose vein treatments have advanced significantly during the past 10 years.¹ With the development of endovenous ablation techniques, procedures to treat varicose veins have become available to most patients under local anesthesia. These techniques offer good technical and symptomatic benefit and reduce the risk of nerve and skin damage.² Previously, patients with long-term anticoagulation presented a difficult scenario; however, endovenous thermal ablation and foam sclerotherapy offer minimally invasive treatment, which is not affected by anticoagulation.³⁻⁹

Recently, new techniques have been developed that do not require tumescent anesthesia.^{10,11} We present the first case of endovenous pharmacologic occlusion using cyanoacrylate glue via the Sapheon Venaseal Closure System (Sapheon Inc, Santa Rosa, Calif) while the patient was therapeutically anticoagulated using warfarin.

CASE REPORT

A 73-year-old man presented to the Charing Cross Varicose Vein clinic with complicated varicose vein disease of the right

leg, with recurrent bleeding from extensive varicosities. He had a CEAP¹² score of C_{4bS} E_p A_s P_r, an Aberdeen Varicose Vein Questionnaire (AVVQ)¹³ score of 15.44, and a Venous Clinical Severity Score (VCSS)¹⁴ of 14. His medical history included atrial fibrillation treated with warfarin and pre-existing use of compression hosiery for varicose vein symptom control. A venous duplex ultrasound scan revealed an incompetent deep venous system, saphenofemoral junction (SFJ), and great saphenous vein (GSV). The maximum diameter of the GSV was 15 mm just distal to the SFJ.

The patient underwent right leg GSV endovenous occlusion in March 2012 with the newly developed Sapheon Venaseal Closure System using standard procedure as follows: The patient was advised not to stop his warfarin anticoagulation. The international normalized ratio at treatment was 2.3. Under local anesthetic, the GSV was cannulated at the knee level and a guidewire passed into the vein. A standard 7F sheath was passed using the Seldinger technique into the vein.

The Sapheon outer catheter was fed into the vein and placed 5 cm distal to the SFJ. The inner glue catheter was primed, leaving a 3-cm air gap at the end of the catheter, and connected to the application gun. The catheter was fed into the outer catheter, and as the glue catheter reached 5 cm from the SFJ, the outer catheter was withdrawn to expose the glue catheter at 5 cm from the SFJ, and the catheters were locked together.

The proximal GSV was then occluded using transverse probe placement 2 cm distal to the SFJ. One full 3-second activation of the glue applicator was completed; then, the catheters were withdrawn 1 cm, and a further application was completed without moving the transverse probe occlusion. The catheter was withdrawn a further 3 cm, and light minimal compression was applied as the initial curing time of 3 minutes was completed using a stopwatch. The rest of the GSV was treated with one application, a 3-cm pullback, and a 30-second minimal compression time. This was repeated to treat 35 cm of GSV.

The wound was closed with a Steri-Strip dressing (3M, St. Paul, Minn) and a cannulation-site plaster (Mepore; Mölnlycke Health

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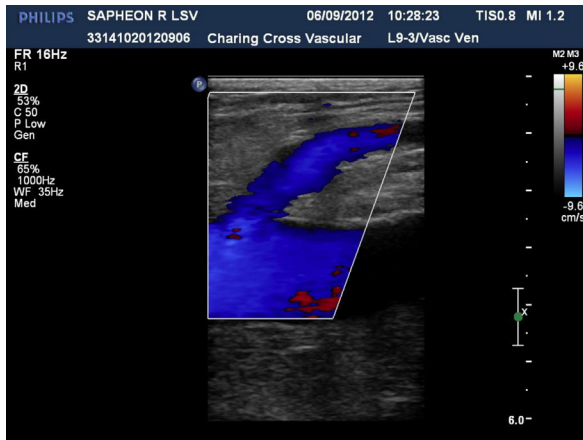


Fig 1. Open saphenofemoral junction (SFJ) at 6 months after glue occlusion.

Care, Gothenburg, Sweden) without sutures. The total procedure took 20 minutes, from the first local anesthetic injection to the application of the wound plaster, and was well tolerated by the patient.

The patient was advised to continue with class II compression hosiery in the long term due to pre-existing mild deep venous incompetence. There was no perioperative bleeding. Completion duplex imaging showed GSV occlusion.

On postoperative clinical and duplex ultrasound review at 8 weeks, the GSV was occluded from the point of entry for treatment to the point of compression, 2 cm distal to the SFJ. The mild deep venous incompetence had resolved. The patient's symptoms were much improved, with no further episodes of bleeding varicosities. His lower leg varicosities had shrunk in size, and he wanted no further treatment. Subjectively, he had experienced no postoperative pain and no inflammation. His VCSS was 7 and AVVQ was 4.64, a reduction of >10 points.

At the 6-month follow-up, his VCSS was 10 and AVVQ was 25.53. His varicosities had not returned; however, significant

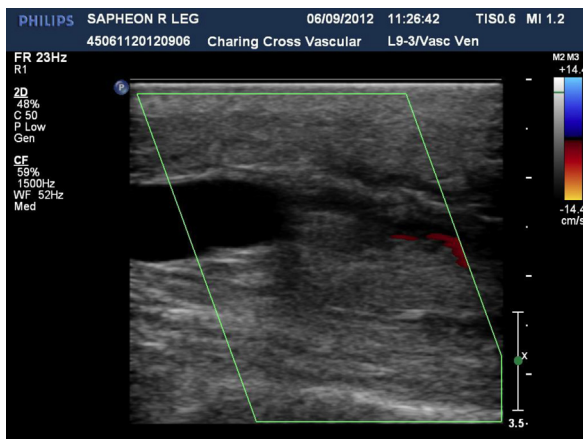


Fig 2. Duplex ultrasound imaging shows patent proximal great saphenous vein (GSV) with partial occlusion and reopening distally.

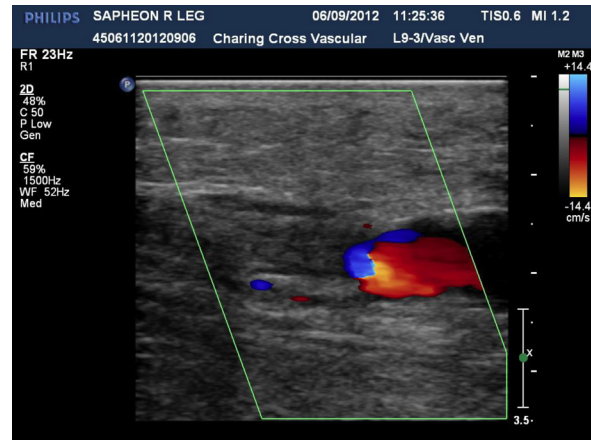


Fig 3. Occluded segment in mid thigh, with open segment below.

edema and symptoms had recurred. On repeat venous duplex imaging, the GSV was recanalized and incompetent (Supplemental Video, online only), with a maximal diameter of 7.2 mm at the SFJ (Figs 1-3). Two 2-cm sections of the GSV in the mid thigh remained completely occluded. The deep venous incompetence remained absent. Repeat treatment of the GSV with foam sclerotherapy was arranged.

DISCUSSION

This report demonstrates the first case of cyanoacrylate glue GSV occlusion while a patient was formally anticoagulated with warfarin. Early technical success and symptom resolution, unfortunately, led to reopening of the treated vein. Despite an increase in venous symptoms and an incompetent GSV, this patient's varicosities remained in remission.

Because the cyanoacrylate occlusion process is separate to the coagulation cascade, it is likely that this treatment failure was secondary to the large vein diameter and the learning curve associated with new procedures.¹⁵ Other techniques have shown early-to-midterm occlusion failures, despite experience,¹⁶⁻²⁰ with previous studies highlighting the risks of track neovascularization.²¹

CONCLUSIONS

This case report highlights the need for thorough follow-up for new technologies and an understanding that isolated cases of recanalization can occur after initial success.

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