Endovenous Thermal Ablation of the Anterior Accessory Great Saphenous Vein

Clinical aspects of ablating the incompetent anterior accessory great saphenous vein.

BY JAMES LAREDO, MD, PHD; BYUNG B. LEE, MD, PHD; AND RICHARD F. NEVILLE, MD

Endovenous thermal ablation of the superficial venous system utilizing radiofrequency or laser energy has become the preferred method to treat superficial venous insufficiency. The great saphenous vein (GSV) is the most common source of superficial venous reflux, occurring in up to 70% of patients presenting with symptomatic varicose veins and venous insufficiency.[1,2] Other less common sources of superficial venous reflux in this patient population include the small saphenous vein (SSV) and the anterior accessory great saphenous vein (AAGSV).

The SSV represents the second most common source of superficial venous insufficiency, occurring in up to 18% of patients. Treatment of the SSV has been reviewed in a previous issue of *Endovascular Today*.[3] Isolated AAGSV reflux occurs in approximately 10% of patients with symptomatic varicose veins and superficial venous insufficiency.[4,5] A recent review of patients treated at our institution with endovenous laser therapy (EVLT) is consistent with this estimate.[5] Furthermore, the AAGSV is also a source of recurrent varicose veins and saphenofemoral junction (SFJ) incompetence after ligation and stripping of the GSV.[6]

ANATOMY

The AAGSV begins at the anterior distal to mid thigh and courses toward the SFJ over the anterior proximal thigh. The AAGSV is usually located outside of the saphenous fascia and drains the anterior and lateral thigh. A recent cadaveric study of the tributaries of the SFJ revealed the presence of the AAGSV in only 51% of cases.[7] In addi-

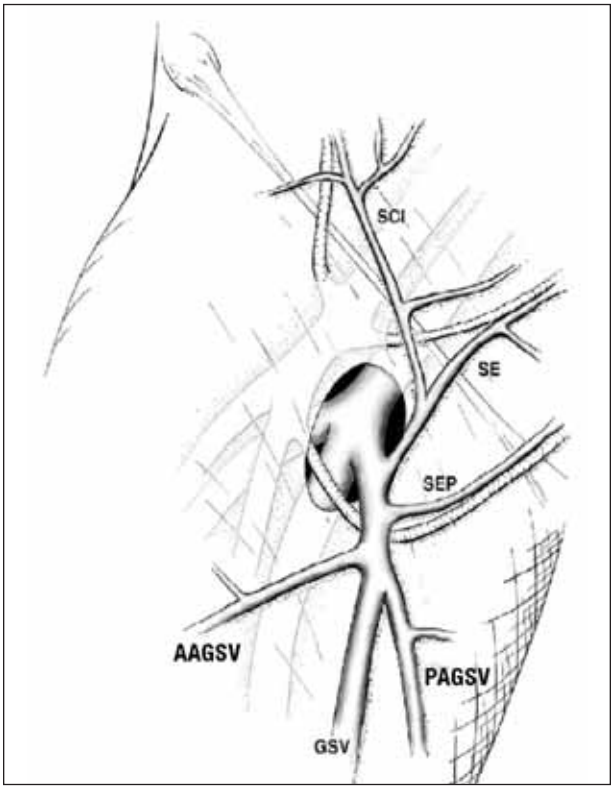

Figure 1. Superficial veins of the SFJ. The AAGSV usually drains into the GSV 1 to 2 cm distal to the SFJ. Other tributaries of the SFJ include the superficial circumflex iliac vein (SCI), the superficial external pudendal vein (SEP), the superficial epigastric vein (SE), and the posterior accessory great saphenous vein (PAGSV).

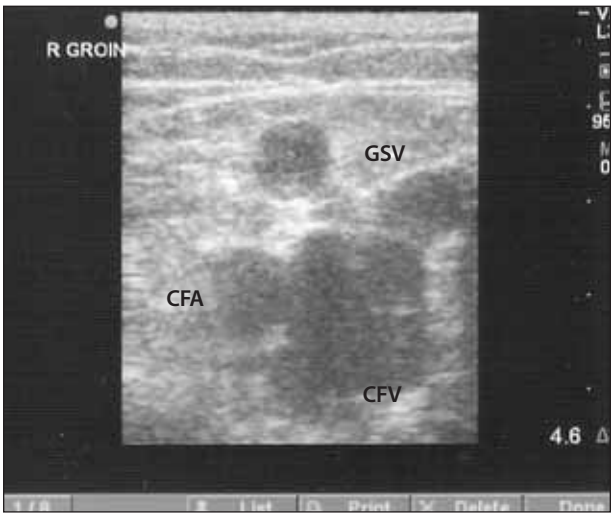

Figure 2. Venous duplex ultrasound of the AAGSV. This transverse image shows the anatomical relationship of the AAGSV with the surrounding vessels. The AAGSV diameter measured 8.5 mm and showed severe reflux. When present, the AAGSV is always superficial to the common femoral vein (CFV), medial to the common femoral artery (CFA), and lateral to the GSV.

Figure 3. A 65-year-old man with recurrent bilateral, symptomatic, anterior thigh varicose veins. He underwent ligation and stripping of the bilateral GSVs 15 years before presentation. The patient was found to have incompetence of the bilateral AAGSVs. He underwent EVLT of the right and left AAGSVs performed 2 weeks apart. The left picture is his appearance before treatment. The right picture is his appearance 3 months after the procedure. Note the distribution of the thigh varicosities before treatment with EVLT (A) and the complete resolution of the thigh varicosities after EVLT (B).

tion, the AAGSV, when present, was found to drain directly into the GSV 1 to 2 cm proximal to the SFJ (Figure 1).

At the groin, the AAGSV is superficial to the common femoral vein and located lateral to the GSV and medial to the common femoral artery (Figure 2). The GSV can easily be distinguished from the AAGSV on venous duplex ultrasound examination by following the course of the vein from groin to thigh. The GSV remains medial and continues below the knee, whereas the AAGSV has a shorter course and is found anterior and lateral to the GSV and terminates at the mid to distal thigh.

The normal diameter of a competent AAGSV is usually 3 mm or less, but a refluxing AAGSV is often 5 mm in diameter or greater.[4,5] The average length of the AAGSV can vary anywhere from 5 to 25 cm in length and may be tortuous with several draining tributary veins.[4,5]

AAGSV INCOMPETENCE

Venous duplex ultrasound examination is required to accurately diagnose and characterize the incompetent AAGSV. Determination of SFJ and GSV competence and recognition of anatomic variation is also critical to the diagnosis and treatment of superficial venous insufficiency due to the AAGSV.

At the Georgetown Vein Center from December 2006 to June 2008, a total of 313 limbs in 255 patients were found to have superficial venous insufficiency involving the GSV, AAGSV, and SSV by venous duplex ultrasound examination. The incidence of isolated AAGSV reflux was 10% (31 limbs in 30 patients). The incidence of both AAGSV and GSV reflux was 1.6% (5 limbs in 5 patients).[5]

The AAGSV is also a source of recurrent reflux and varicose veins in the thighs of patients who have had previous ligation and stripping of the GSV.[6] In our study, of the patients with isolated AAGSV insufficiency, 16 limbs in 16 patients (51.6%) had recurrent varicose veins and previous GSV treatment of the ipsilateral limb. Six patients had previous EVLT of the GSV, and 10 patients had previous GSV ligation and stripping. In another report, 36.6% of the patients (12 of 33 patients) with isolated AAGSV reflux had previous GSV treatment, three patients had undergone EVLT, and nine patients had undergone ligation and stripping.[4]

Incompetence of the AAGSV often produces varicosities in the anterior and lateral thigh. Patients with AAGSV reflux often have large, symptomatic varicosities over the anterior and lateral thigh (Figure 3).

TREATMENT

Endovenous thermal ablation of the AAGSV is similar to GSV treatment. The patient is positioned supine with the knee slightly flexed and the hip externally rotated. After skin preparation and draping, the incompetent AAGSV is imaged and punctured under ultrasound guidance. Cannulation of the AAGSV should be performed at the lowest point of reflux, which is usually found to be over the anterior mid-thigh region. The ablation catheter can then be placed into the AAGSV. We recommend that the thermal

ablation catheter be positioned 1 cm distal to the GSV where the AAGSV typically drains (Figure 1). In a patient with both an incompetent AAGSV and GSV undergoing simultaneous treatment of both veins, a separate ablation catheter should also be positioned in the GSV. Infiltration of tumescent anesthetic should proceed in a similar fashion as is performed during ablation of the GSV.

After adequate infiltration of tumescent anesthetic, thermal ablation should commence as is performed for the GSV. The average length of AAGSV treated in our series of patients was 14.3 cm (range, 5–22 cm; n = 36).[5] In another report, the average length of AAGSV treated by EVLT was 19 cm (range, 14–24 cm; n = 33).[4]

In a patient undergoing ablation of both the AAGSV and GSV, each vein should be ablated sequentially. The order in which each vein is ablated is not important, although we prefer to ablate the AAGSV first followed by the GSV using laser energy.

After ablation of the AAGSV, the ablation catheter is removed and pressure is applied to the puncture site to achieve hemostasis. The limb is washed with sterile saline, and a dressing is placed over the puncture site. The limb is then wrapped with a compression bandage, and the patient is discharged home. Postprocedure compression therapy should be continued as is recommended for GSV ablation.

OUTCOMES

Thermal ablation of the GSV utilizing both radiofrequency and laser energy has been shown to be efficacious in the treatment of GSV reflux. Recanalization rates have been reported to be in the range of 1.7% to 5.5%.[8] The same can be said regarding thermal ablation of the AAGSV.[4,8] Recanalization rates of the AAGSV are believed to be < 1% in reports with at least 1-year follow-up.[4,8]

In our series of patients treated with EVLT at Georgetown University Hospital, a total of 36 AAGSVs were ablated in 36 limbs in 35 patients (30 women, 5 men; mean age, 51.8 y). Five patients with reflux of both the AAGSV and GSV underwent simultaneous ablation of both veins. The amount of thermal laser energy delivered to the AAGSV was 70 J/cm. CEAP clinical classification (clinical severity, etiology or cause, anatomy, and pathophysiology) was: C2, n = 20; C3, n = 6; C4, n = 6; C5, n = 2; and C6, n = 1. Concomitant phlebectomy of symptomatic varicosities was not performed. Postprocedure venous duplex ultrasound showed complete ablation of 100% of treated AAGSVs at 3, 6, and 9 months.[5]

At 3 months after EVLT of the AAGSV, subsequent sclerotherapy for residual symptomatic varicose veins was required in only 11 of the 36 treated limbs in 35 patients (30.6%), none of which belonged to the subgroup of patients who underwent both AAGSV and GSV ablation. The majority of patients (70%) did not require additional treatment of their thigh varicose veins. Complications including deep vein thrombosis, phlebitis, and cellulitis were not seen in any of the treated patients.[5]

In another report, 33 patients who underwent EVLT of the AAGSV had no recanalization of the treated vein at 1 year.[4] In contrast to our results, more than half of the treated patients required additional sclerotherapy of residual symptomatic varicose veins (20 of 33 patients, 61%). Complications were limited to two cases of postprocedure phlebitis.

CONCLUSION

AAGSV reflux is the third most common cause of superficial venous insufficiency. The AAGSV is present in approximately 50% of patients, and valvular incompetence of the AAGSV is present in 10% of patients with superficial reflux. Up to 50% of patients with AAGSV reflux have had previous treatment of the ipsilateral GSV. Endovenous thermal ablation of the incompetent AAGSV is efficacious and is associated with minimal complications. ■

James Laredo, MD, PhD, is Assistant Professor, Division of Vascular Surgery, Department of Surgery at Georgetown University Medical Center in Washington, DC. He has disclosed that he holds no financial interest in any product or manufacturer mentioned herein. Dr. Laredo may be reached at (202) 444-2255; jl393@georgetown.edu.

Byung B. Lee, MD, PhD, is Clinical Professor, Division of Vascular Surgery, Department of Surgery at Georgetown University Medical Center in Washington, DC. He has disclosed that he holds no financial interest in any product or manufacturer mentioned herein. Dr. Lee may be reached at (202) 444-2255; bblee38@comcast.net.

Richard F. Neville, MD, is Associate Professor and Chief of the Division of Vascular Surgery, Department of Surgery at Georgetown University Medical Center in Washington, DC. He has disclosed that he holds no financial interest in any product or manufacturer mentioned herein. Dr. Neville may be reached at (202) 444-2255; neviller@gunet.georgetown.edu.

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