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Case Report Open Access

Isolated insufficiency of the anterior accessory saphenous vein: should it be treated alone?

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ABSTRACT

Venous disorders of the lower limb are frequently seen in the general population. As the endovenous treatment of the venous disorders has evolved in the last two decades, our understanding on venous system anatomy has extended. Accessory saphenous vein is present in nearly half of the patients with lower limb venous insufficiency and should be taken into consideration before planning the treatment. In this article, we report a rare case of isolated reflux in an anterior accessory saphenous vein in the absence of a great saphenous vein insufficiency.

Keywords: Anatomy; saphenous vein; venous insufficiency.

Venous disorders of the lower limbs are common and may cause substantial morbidity in the general population, presenting a wide spectrum of clinical severity ranging from a minor varicosity to the chronic leg ulcers.[1] The prevalence of chronic venous insufficiency is as high as 17% of males and 40% of females.[2] The prevalence of the simple varicose veins is even greater in the population reaching 73% in females and 56% of males.[2] Irrespective of the clinical severity of the disease, chronic venous insufficiency almost always present with a superficial venous disease.[3] The great saphenous vein (GSV) reflux is the most common source of chronic venous insufficiency in up to 70% of the patients, followed by the small saphenous vein (SSV) (18%) and anterior accessory saphenous vein (AASV) (10%).[4] Anatomically, AASV begins at the distal thigh and courses upwards outside the saphenous compartment anterior to the GSV and drain into the femoral vein or GSV around the saphenofemoral junction (SFJ). It is present in 51% of the general population.[5]

During the last two decades, venous system has re-gained popularity with the advances in the endovenous treatments of venous diseases.[3] After the endovenous thermal ablations of the GSV mostly replaced with the conventional surgical practice, the anatomy and the variations of the venous system has been re-questioned and the nomenclature has been revised.[4,6] In this article, we report a rare case of isolated reflux in an anterior accessory saphenous vein in the absence of a great saphenous vein insufficiency which was treated with endovenous thermal ablation.

CASE REPORT

An healthy 24-year-old female patient was admitted to the outpatient clinic with complaint of numerous varicosities in her left leg. On physical examination, a large number of varicosities were seen over the anterior thigh. Duplex ultrasound (US) revealed a normal sized (3.8 mm) GSV with no reflux. However, an insufficient AASV with a diameter of 8.9 mm was present, which was feeding the other numerous venous packs (Figure 1). It was also extending down subcutaneously in parallel with the GSV through its distal course to the knee. Duplex US also revealed a severe reflux (>3 sec) in the common femoral vein segment above the level of SFJ. Reflux was due to the siphon effect and was directing back into the GSV, then leaking into the AASV as the pre-terminal valve of the GSV was intact. The GSV was anterolaterally anastomosed by AASV between the terminal and the pre-terminal valve of the GSV.

The patient was planned to be treated endovenously using radiofrequency thermal ablation (RFA). Under the Duplex US guidance, two 7F introducers were

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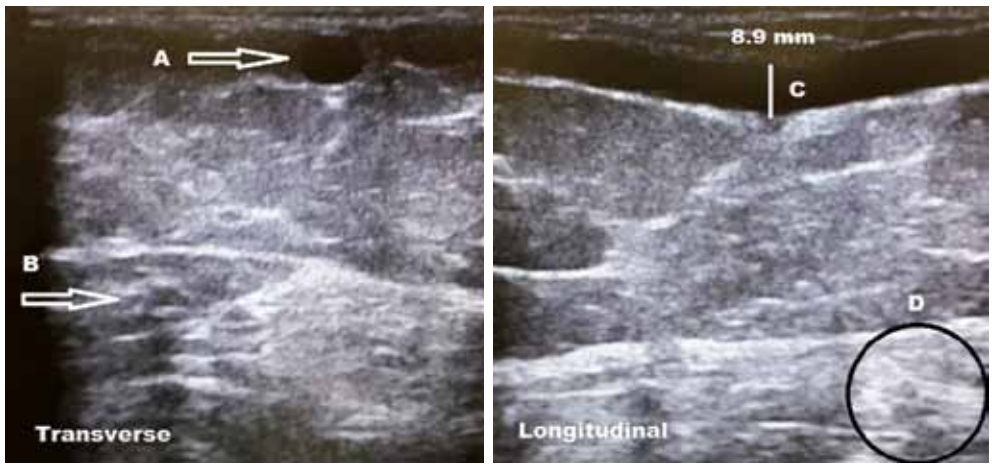

Figure 1. **(a)** The transverse view of the anterior accessory saphenous vein. **(b)** Great saphenous vein (and the saphenous compartment as 'Egyptian eye'). **(c)** The longitudinal image and measurement of the dilated anterior accessory saphenous vein. **(d)** Tip of the 7F catheter inside the great saphenous vein.

placed via Seldinger's technique inside the AASV and GSV side by side (Figure 2). The procedure was applied to the GSV and AASV consecutively with a separate perivenous application of the tumescent anesthesia. Operation was completed without any complication. The patient was discharged the other day with a venotonic and analgesic prescription and scheduled for a two week postoperative control.

DISCUSSION

Venous system anatomy constitutes the fundamental of the clinical phlebology and is essential for the accurate diagnosis and treatment of venous disorders.[6] The venous system anatomy of the lower limb are highly variable; however, it is within a systematic order.[7] The veins of the lower limb can be examined in three groups: deep veins, superficial veins, and perforating veins.[8] These are located in two compartments, namely the deep and superficial compartments. The deep compartment is delimited by the muscular fascia and contains deep veins, while the superficial compartment is delimited deeply by the muscular fascia and superficially by the skin containing the superficial veins.[6] Perforating veins can be only defined as the vascular communications between the veins of these two compartments, crossing through the holes in the muscular fascia. Within the superficial compartment, the separate saphenous compartment lies on the dorsum of the foot up to the inguinal ligament with a characteristic ultrasonographic view of the 'saphenous eye' or 'Egyptian eye' (Figure 1).[7,8] This saphenous compartment deeply bounded by the muscular fascia and superficially by the saphenous fascia.[9] The saphenous fascia, which was previously defined and then abandoned as Colles or Scarpa fascia, is the membranous layer of the subcutaneous tissue overlying the GSV and its roots, as well as the dorsal arch of the foot.[6,10] The saphenous compartment contains saphenous vein and accompanying nerves and arteries, whereas the tributaries and accessory veins lie externally.[6]

The accessory saphenous veins are the venous structures which lie in parallel and coursing superficially either anteriorly or posteriorly to the GSV outside the saphenous compartment.[6] Anterolateral and posterolateral veins of the thigh are the tributaries of the anterior and posterior accessory saphenous veins, respectively. Several types of anastomosis regarding the drainage of an accessory saphenous vein may be observed. It may drain directly into the femoral vein (below or above to the SFJ), GSV or into one of its tributaries (external pudendal vein, superficial epigastric vein, superficial circumflex iliac vein).

In the light of all these anatomic review and the setting of the nomenclature, some questions can be asked on the reported case. Firstly, what was the reason for the development of an isolated AASV insufficiency without affecting the GSV? Was AASV unprotected

compared to the GSV? What protected the GSV? Could GSV be left untreated, as it was normal?

As aforementioned, the AASV lies subcutaneously outside the saphenous compartment, making it more vulnerable to any venous hypertension rather than the GSV which lies within the saphenous compartment. Being buried in such a protective compartment may also explain the etymological origin of the saphenous vein which thought to be derived from the Arabic word 'al Safin' meaning 'hidden'. This connective sheath surrounding the GSV opposes the dilatation of the vein by serving a protective external cuff around the GSV. However, this surrounding sheat is not present around the AASV.[9] Additionally, contraction of the thigh muscles may modify the diameter of the GSV, as it happens in the deep veins.[9] Another possible reason for the development of an insufficiency in the AASV may be its fragile wall, compared to the relatively thicker saphenous type media layer. As the usual caliber of the GSV in our case without any visible reflux could not be left untreated, it was ablated. Otherwise, if the GSV was left untreated, the reflux would shift back into the GSV, instead of the AASV, soon after the ablation of the AASV, since the terminal valve of the SFJ was already insufficient. This insufficient valve would eventually damage the previously intact pre-terminal valve and would cause the GSV to become gradually insufficient and dilated. Therefore, to prevent further recurrences regarding the GSV, it should be treated prophylactically, if the accessory vein drains into the GSV at any level. However, the GSV may be left untreated, when an insufficient accessory vein drains individually into the femoral vein without any anastomotic relationship with the GSV.

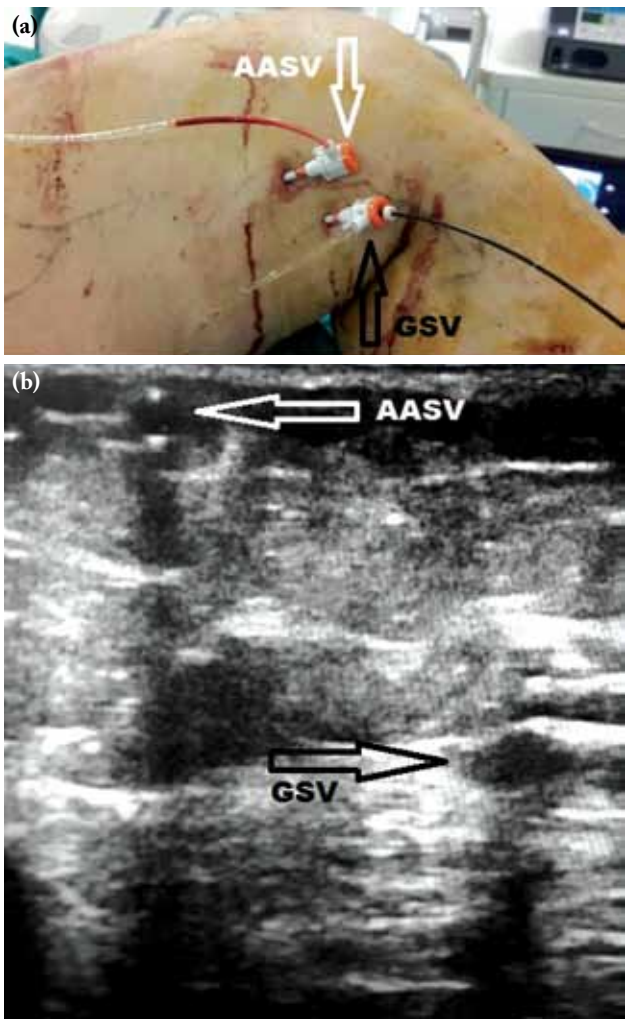

Figure 2. **(a)** Two 7F catheters placed together before tumescent anesthesia. **(b)** The transverse Duplex ultrasound image of both anterior accessory saphenous vein and great saphenous vein. AASV: Anterior accessory saphenous vein; GSV: Great saphenous vein.

In our case, two separate sheaths were introduced simultaneously into the GSV and the AASV, as seen in Figure 1a. If these two veins were cannulated separately instead of being simultaneous, the swelling effect of the tumescent anesthesia would deteriorate the Duplex US image, complicating the percutaneous access. In addition, endovenous thermal ablation procedure is performed under the tumescent anesthesia in which the gross amount of fluid containing local anesthetic is injected perivenously. If any of these veins was cannulated first and the other was remained uncannulated, the access to the remaining uncannulated vein might be difficult or even impossible after subsequent application of the tumescent anesthesia.[11] As a result, they were cannulated together before application any tumescent anesthesia.

Although the sequence of ablation is not critical, a particular interest should be given to the AASV, as it has a proximity to the skin.[12] The amount of the tumescent anesthesia should be kept high to protect the overlying skin from the thermal injury.[11] The venous tributaries are not necessarily extirpated, as they originate from the insufficient AASV. They will eventually fade away, as their primary feeding source is treated.

Anterior accessory saphenous vein is present nearly 50% of the patients and it is the third common cause of the chronic venous insufficiency.[5] In physical

examination and Duplex US investigation findings excluding the presence of the AASV may cause misdiagnosis, undertreatment, and possible recurrences.[13] Detailed preoperative Duplex US imaging is, therefore, necessary to figure out any anatomic description.[7]

In conclusion, we suggest that the isolated AASV insufficiencies should be treated together with the GSV. When they have a connection with each other, the endovenous thermal ablation procedure is effective in this treatment.

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REFERENCES

1. Evans CJ, Fowkes FG, Ruckley CV, Lee AJ. Prevalence of varicose veins and chronic venous insufficiency in men and women in the general population: Edinburgh Vein Study. J Epidemiol Community Health 1999;53:149-53.
2. Beebe-Dimmer JL, Pfeifer JR, Engle JS, Schottenfeld D. The epidemiology of chronic venous insufficiency and varicose veins. Ann Epidemiol 2005;15:175-84.
3. Min RJ, Zimmet SE, Isaacs MN, Forrestal MD. Endovenous laser treatment of the incompetent greater saphenous vein. J Vasc Interv Radiol 2001;12:1167-71.
4. Laredo J, Lee BB, Neville RF. Endovenous thermal ablation of the anterior accessory great saphenous vein. Endovasc Today 2010;March:36-9.
5. Mühlberger D, Morandini L, Brenner E. Venous valves and major superficial tributary veins near the saphenofemoral junction. J Vasc Surg 2009;49:1562-9.
6. Caggiati A, Bergan JJ, Gloviczki P, Jantet G, Wendell-Smith CP, Partsch H. Nomenclature of the veins of the lower limbs: an international interdisciplinary consensus statement. J Vasc Surg 2002;36:416-22.
7. Cavezzi A, Labropoulos N, Partsch H, Ricci S, Caggiati A, Myers K, et al. Duplex ultrasound investigation of the veins in chronic venous disease of the lower limbs--UIP consensus document. Part II. Anatomy. Eur J Vasc Endovasc Surg 2006;31:288-99.
8. Caggiati A. Fascial relationships of the long saphenous vein. Circulation 1999;100:2547-9.
9. Caggiati A, Ricci S. The long saphenous vein compartment. Phlebology 1997;12:107-11.
10. Wendell-Smith CP. Fascia: an illustrative problem in international terminology. Surg Radiol Anat 1997;19:273-7.
11. Alomari AI. Simple system for perivenous tumescent infusion for endovenous laser ablation. Phlebology 2012;27:242-4.
12. Shin S, Lee BB, Neville RF. Endovenous laser ablation of the anterior accessory great saphenous vein. Endovasc Today 2010;9:36-9.
13. Garner JP, Heppell PS, Leopold PW. The lateral accessory saphenous vein - a common cause of recurrent varicose veins. Ann R Coll Surg Engl 2003;85:389-92.