SHORT REPORT

Aplasia of Great Saphenous Vein: A Case Report

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A case of complete aplasia of the great saphenous vein (GSV) is described. A 60 year-old woman presented with signs and symptoms of chronic venous disease (CVD) to the vascular laboratory. The patient was examined using duplex ultrasound (DU) and was found to have aplasia of the GSV in her left leg from the lower calf to sapheno-femoral junction (SFJ). The contralateral GSV had segmental aplasia.

Keywords: Aplasia; Great saphenous vein; Chronic venous disease; Duplex ultrasound; Anterior accessory saphenous vein.

Introduction

The GSV runs within the saphenous compartment. This compartment resembles an “Egyptian eye” in a transverse scan and is easily visualized on duplex ultrasound (DU) because the superficial saphenous fascia is echogenic.1 The deep layer arises from the muscular fascia. The GSV can easily be distinguished from the anterior accessory saphenous vein (AASV) on DU due to the more anterior and lateral position of the AASV relative to the GSV.1

Recent experience has revealed anatomic variations of the GSV including duplications, accessory vessels, segmental hypoplasia, and aplasia.2 Aplasia of the GSV is segmental and occurs most frequently near or at the level of the knee.3 However, aplasia of the entire GSV has not been reported. We present a patient who had aplasia of the GSV from the groin to the lower calf.

Case Report

A 60 year-old woman was referred to the vascular laboratory for investigation of the signs and symptoms of CVD. She had telangiectasias, varicose veins and mild swelling. The patient had pain in both legs as well as a burning sensation in her right leg. Her mother also had varicose veins. She had had 4 pregnancies and the varicosities developed during her 3rd pregnancy, 30 years previously. She had no history of thrombosis and had received no treatment for her veins. Her medical and surgical history was free of any pathology. Upon examination with DU she was found to have GSV aplasia from the sapheno-femoral junction (SFJ) to the lower calf in her left lower limb (Fig. 1). Instead the AASV joined the common femoral vein at the usual SFJ location. The AASV exited the saphenous compartment 12 cm from the medial malleolus, at which point the vein becomes a tributary of the GSV. A tributary vein is one which runs parallel to its associated saphenous vein, but is located outside the saphenous compartment and may pierce the superficial fascia to enter the saphenous compartment.1

The vein then continued up the entire limb outside, anterior and superior to the saphenous compartment. The vein then entered the antero-lateral saphenous compartment (hence becoming the AASV) 15 cm...
below its point of union with the common femoral vein (CFV). Thus the GSV was completely aplastic from 12 cm superior to the medial malleolus to the SFJ.

The veins were evaluated for reflux using manual compression and sudden release as previously described. Using this method, the saphenous accessory vein was found to have reflux along its entire length. Furthermore, the small segment of the GSV in the distal calf was found to have reflux as well.

Examination of the right limb demonstrated a GSV within the saphenous compartment in the thigh. There was segmental aplasia of the GSV from the knee to mid calf. An AASV was present which existed at the level of aplasia of the GSV. The GSV and accessory saphenous veins had reflux in continuity. This limb was asymptomatic and had only telangiectasias. Perforator and deep veins were normal in both limbs. No evidence of previous thrombosis was found in any vein.

The patient was initially managed medically with elevation and compression therapy for several months. However, during this time the patient’s right limb became symptomatic as well. The patient recently elected to undergo surgical management for her right lower extremity. She underwent laser ablation of the right GSV with stab avulsions of the varicose veins. She will have the left leg operated in the near future. The thigh segment of the AASV will be ablated by laser and the rest will be removed with local avulsions due to its proximity to the skin.

Fig. 1. Diagrammatic representation and ultrasound images demonstrating the anatomy of the GSV and accessory vein in our case. The GSV in the left limb is absent from the saphenous canal, while in the right limb there is segmental aplasia. (a) Crosssectional view of the common femoral vein showing absence of the SFJ. (b) Crosssectional view of the medial aspect of the upper thigh. The accessory saphenous vein (arrow) is parallel to the femoral vessels. The GSV, which is typically located medial to the accessory vein and femoral vessels, is absent. (c) The accessory vein had significant reflux as demonstrated by the red color and the reverse flow on the Doppler tracings. (d) The GSV is absent in the upper calf. No vein is seen in the saphenous canal medial to the tibial bone (arrow). (e) Cross-sectional view of the GSV in the right limb. It is located in the saphenous canal and is medial to the femoral vessels.
Discussion

The incidence of aplasia at the SFJ has been reported as 0.3% of non-varicose limbs and 1.2% of limbs with a segmentally aplastic and varicose GSV. Aplasia in other portions of the GSV has been reported to occur at various frequencies. In a dissection study of 32 limbs, 17.4% of limbs were determined to have segmental aplasia in the GSV as it was shown in the right limb of our patient. In a recent study of 676 normal limbs and 320 limbs with varicose veins by duplex ultrasonography segmental aplasia was found in 12% and 25% respectively (p < 0.001). However, no known documented cases of aplasia of almost the entire GSV have been reported.

Aplasia is defined as a complete absence of a vein from its normal anatomic location. The most likely cause of aplasia is the result of segmental failure of a critical anastomosis. Hypoplasia and aplasia represent a significant risk factor for the development of reflux and varicosities. Recognizing aplasia in the GSV is important as it is often used as a bypass graft.

This patient had almost complete aplasia of the GSV in the left lower limb, including the level of the SFJ. Normally the GSV joins the common femoral vein about 3–4 cm inferior and lateral to the pubic tubercle. Although this junction was absent the AASV connected with the common femoral vein at this level. A saphenous accessory vein has been defined as an additional vein being located outside the saphenous compartment, which runs parallel to the GSV, rejoining the GSV at a later distance. In contrast to this general definition, the AASV is the venous segment which runs parallel to the GSV in the thigh within its own, separate fascial compartment. The AASV is easily identifiable because of its more anterior path with respect to the GSV. Furthermore, the AASV takes a path that aligns with the femoral artery and vein. The GSV was present for a short distance in the distal calf, 12 cm proximal to the medial malleolus, where the vein was located within the saphenous compartment. The saphenous compartment is a fascial canal, which normally encloses the GSV. The compartment is bounded deeply by the muscular fascia and by the "saphenous fascia" superficially, which is a membranous layer of the subcutaneous tissue. This patient presented with telangiectasias, swelling, and varicose veins. The AASV has been found to be involved in 14% of patients with varicose veins. The AASV in this patient had significant reflux. This is not unexpected as accessory and tributary vessels of the saphenous veins are more prone to dilation and reflux development being outside the saphenous compartment.

References


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