Anomalous termination of a small (short) saphenous vein associated with its abnormal course in the thigh: a case report

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Abstract
Introduction
Variations in superficial veins of the lower limb are not uncommon. This report discusses a case of anomalous termination of a small saphenous vein associated with its abnormal course in the thigh.

Case report
During a routine dissection of a cadaver, an abnormal small (short) saphenous vein was observed in the right lower limb of a 60-year-old male cadaver. The origin of the small saphenous vein and its course in the leg was normal. However, instead of draining into the popliteal vein, it continued onto the medial side of the thigh in the superficial fascia posterior to the great saphenous vein and finally it joined the great saphenous vein about a centimetre proximal to the saphenous opening. About 2 inches below its termination, the short saphenous vein was joined by a communicating vein which was connecting it with the great saphenous vein.

Conclusion
Prior knowledge of such a variant pattern of superficial veins of the lower limb is useful for clinicians during coronary bypass procedures, as these vessels are commonly used in such surgeries.

Introduction
Among the veins of the lower limb, the long (great) saphenous and the small (short) saphenous veins mark the major attraction clinically. Both the veins belong to superficial sets of the veins, lie in the superficial fascia and possess valves.

The long (great) saphenous vein, being the longest vein in the body, begins as a continuation of the medial marginal vein of the foot and ends in the femoral vein distal to the inguinal ligament. It ascends in front of the medial malleolus followed by passing obliquely across the medial surface of the tibia. In the upper part of the leg, it is accompanied by saphenous nerve and finally opens into the femoral vein after passing through the saphenous opening1.

Usually, the short (small) saphenous vein begins as a continuation of the lateral marginal vein posterior to the lateral malleolus. It ascends lateral to the calcaneal tendon, inclining medially to reach the midline of calf, emerges at the lower limit of popliteal fossa before terminating into the popliteal vein about 3–7.5 cm above the knee joint1.

As reports on variations of the short saphenous vein are rare, a case of abnormal course and termination of the short saphenous vein is reported here.

Case report
During a routine dissection for undergraduate medical students, an abnormal short saphenous vein in the right lower limb of a 60-year-old male cadaver was observed. The origin and course of the small saphenous vein was normal in the leg. However, instead of draining into the popliteal vein in the popliteal fossa, it continued onto the medial side of the thigh in the superficial fascia posterior to the great saphenous vein and finally it joined the great saphenous vein about a centimetre proximal to the saphenous opening. About 2 inches below its termination, the short saphenous vein was joined by a communicating vein which was connecting it with the great saphenous vein (Figure 1).

Figure 1: Dissection of the front and medial aspect of the right thigh showing the termination of small (short) saphenous vein (SSV) into the great (long) saphenous vein (GSV). A communicating vein (CV) connecting the SSV with the GSV is also seen.
**Case report**

**Discussion**

Variations in the superficial veins of the lower limb are not uncommon, particularly in their mode of termination. Considering the fact of varied drainage pattern of short saphenous vein, the earlier studies categorised its termination into three types. In type I, it drains into the popliteal vein as its normal pattern of termination. However, this type is further subdivided into two subtypes where it may completely drain into the popliteal vein or it may bifurcate to drain into both popliteal and great saphenous veins. In type II, it extends up to the thigh and it may drain into the femoral vein, veins of the posterior compartment of the thigh or into the great saphenous vein. This type is also further subdivided into three subdivisions as (a) deep veins of the thigh, (b) both the deep veins of the thigh and the great saphenous vein and (c) directly in the great saphenous vein. In type III, it drains into the leg veins without reaching the popliteal region with the further two subdivisions being (a) termination into the great saphenous vein or (b) into the gastrocnemius veins. Though this case falls under type II (c) category, the presence of communicating veins adds to the rarity of the case. This communicating branch may be regarded as an accessory saphenous vein. Moreover, type II (c) accounts for a very low percentage (5.6%) of incidences when compared to other types in this category as reported in the literature.

Embryologically, the cervical and lumbar intersegmental vessels extend into corresponding limbs and start to form an anastomosing network during the early vasculogenesis period. Later, when a single axial artery is formed, its blood returns to the cardinal system through a pre-axial vein—the great saphenous vein in the lower limb and through a post axial vein—the short saphenous vein. However, in early embryonic life, the ancestor of the short saphenous vein is the marginal fibular vein that joins the posterior cardinal vein. But later on it joins the ischiadic vein. Ongoing process of development of the lower limb favours between the great and short saphenous systems. However, alterations in any of these stages results in the variations in the outcome of anastomosis.

The thigh extension of the short saphenous vein is generally termed as Giacomini’s vein, as it was described by Giacomini. It has been reported that, when short saphenous vein insufficiency coexists, varices secondary to the presence of Giacomini vein are common. A study on Giacomini veins in an Indian population was conducted by Prakash et al., highest (92%) prevalence of this vein was observed when compared to other studies conducted on other populations by various workers. Due to the insufficiency of this vein, earlier it was thought to be of little importance in the majority of patients with varicose diseases. However, later, the ultrasound scanning study conducted by Georgiev et al., reported that it can be affected by varicose disease with reflux either upwards or downwards in the thigh to the great or small saphenous veins, respectively. Delis et al. suggested that, when the great saphenous vein cannot be harvested for any reason, the Giacomini veins can replace it during arterial bypass surgery in infra inguinal arterial reconstruction. The varied termination of small saphenous vein or its junction with the popliteal vein (saphenopopliteal junction) can be best detected by colour Doppler ultrasound method. This technique offers an advantage to the non invasive approach over the intra-operative phlebographic procedures in the operative case of the varicose vein.

**Clinical importance**

The knowledge of superficial veins of the lower limb is useful for clinicians during coronary bypass procedures, as these vessels are commonly used in such surgeries. The long saphenous vein is often harvested for grafts and used both in peripheral and coronary arterial surgery. It is therefore, essential for surgeons before harvesting the great saphenous vein to look for the abnormal drainage pattern of the short saphenous vein into the great saphenous vein either directly or through communicating veins or with the presence of the Giacomini vein.

**Conclusion**

Understanding the variant pattern of termination of the short saphenous vein is important during investigative procedures involving phlebotomies. This is because the variant termination of the small saphenous vein may contribute to recurrent varicose veins in this territory; this aspect generally makes the subject of interest in the view of varicose vein operations.

**References**