

Case report**A DUPLICATED GREAT SAPHENOUS VEIN AND CLINICAL SIGNIFICANCE FOR VARICOSITY****Waseem Al Talalwah^{1*}, Roger Soames²**¹*Department of Basic Medical Sciences, College of Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia*²*Centre for Anatomy and Human Identification, College of Art, Science and Engineering, University of Dundee, Dundee, United Kingdom***RESUMEN**

En varios estudios se ha relacionado la vena safena magna doble con dilataciones varicosas. Durante una clase de disección de pre-grado de la extremidad inferior se encontró una doble vena safena magna unilateral en el miembro inferior izquierdo de un cadáver masculino. La incidencia de esta variación fue del 1,3% de todos los especímenes muestra. En este trabajo se reporta la variabilidad del drenaje venoso de las extremidades inferiores para mejorar la conciencia para los radiólogos vasculares y proporcionar además una opción adicional en la cirugía de bypass de la arteria coronaria para evitar las várices iatrogénicas.

Palabras clave: *doble vena safena magna; venas comunicantes safenas; várices iatrogénicas.*

ABSTRACT

A double great saphenous vein has been associated with varicosity in a number of studies. During routine undergraduate dissection of the lower limb a unilateral double great saphenous was found in the left lower limb of a male cadaver. The incidence of this variation was 1.3% of all specimens. This paper reports the variability of lower limb venous drainage to increase the awareness for vascular radiologists and provide further an additional option in coronary artery bypass surgery to avoid iatrogenic varicosity.

Keywords: *Double great saphenous vein; saphenous communicating veins; iatrogenic varicosity.*

INTRODUCTION

The lower limb has superficial and deep venous systems. The superficial system includes the great and short saphenous veins, which drain into the femoral and popliteal veins (deep venous system) respectively. The superficial veins of the lower limb are found in subcutaneous tissue and consist of reticular veins in addition to the great and short saphenous veins and their tributaries. The saphenous fascia and muscularis fascia form a closed space referred to as the saphenous compartment containing the saphenous vein, facial septa, fatty tissue, saphenous artery and the saphenous nerve (Caggiati and Mendoza, 2004).

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Received: 10 February, 2014. **Revised:** 23 February, 2014. **Accepted:** 10 March, 2014.

The great saphenous vein ascends on the medial side of the thigh terminating by draining into the femoral vein after penetrating the cribiform fascia of the saphenous opening and femoral sheath. During its course it receives tributaries from the foot via the medial marginal vein as it passes anterior to the medial malleolus, ascending on the medial side of the calf and into the thigh. In the calf it communicates with the small saphenous vein, as well as the deep anterior and posterior tibial veins. In the thigh, it receives many tributaries from the superficial veins of the medial and posterior compartments (Standring, 2005). Furthermore, the great saphenous vein

possesses between ten and twenty valves (Standring, 2005).

Prior to passing through the saphenous opening the great saphenous vein receives the superficial epigastric, superficial iliac circumflex, and superficial external pudendal veins. In cases of external iliac vein thrombosis, the great saphenous vein has an essential role in returning blood to the heart via communications between the femoral and axial systems: the thoraco-epigastric veins join the superficial epigastric vein and run on the lateral side of the trunk.

The current study aims to describe the double great saphenous vein variation in relation to iatrogenic varicosity.

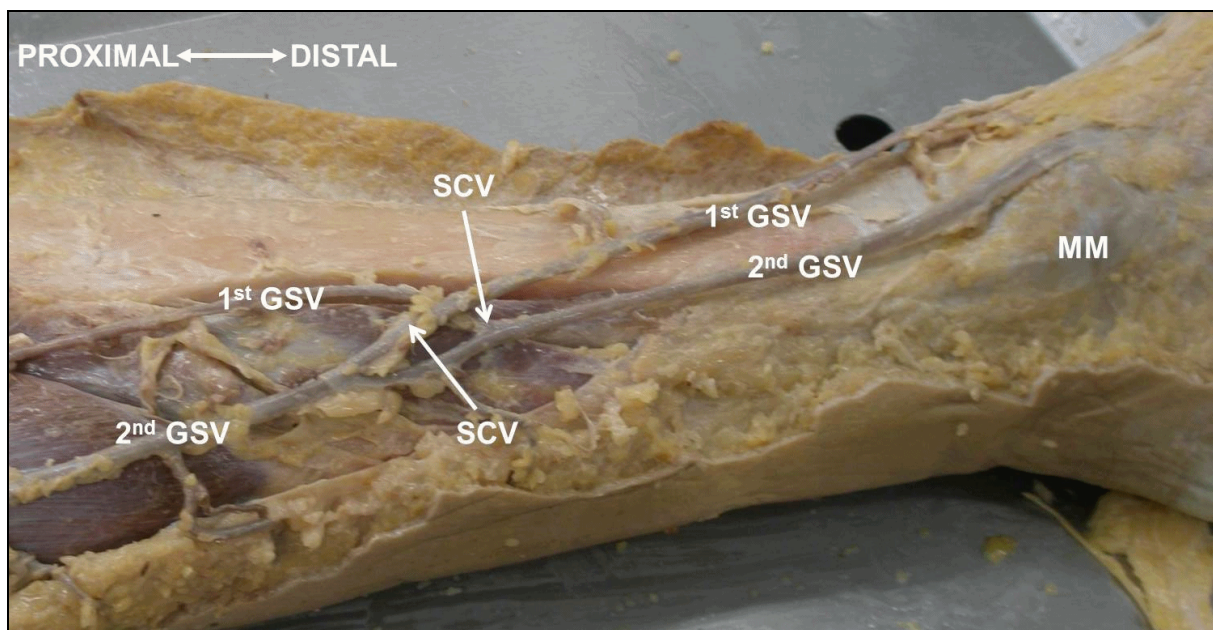


Figure 1 - Double saphenous vein crossing ankle joint. Both great saphenous veins start on the dorsum of the foot and ascend the limb. In the calf there are two saphenous communicating veins (LSV. Lateral saphenous vein, 1st GSV. First great saphenous vein, 2nd GSV. Second great saphenous vein, SCV. saphenous communicating vein).

CASE REPORT

The current study presents a rare venous variation observed 1 of 39 cadavers (16 males, 23 females: 78 lower limbs) during dissection and examination of the venous drainage of lower limb. The dissection was of the entire lower limb to study the entire course of the great saphenous vein and its tributaries. The left limb of a 59 years old Caucasian male cadaver presented with a double (duplicate) great saphenous veins both of which commenced on the dorsum of the foot

running anterior to the medial malleolus. In the calf both veins ascended, being joined to each other by two communicating veins at the mid-calf level (Figure 1), passing medially at the knee joint. In the mid-thigh the two veins communicated, following which each decreased in size. In the proximal thigh, a lateral accessory saphenous vein joined with the double saphenous veins to form a single saphenous trunk which then drained into the femoral vein (Figure 2).

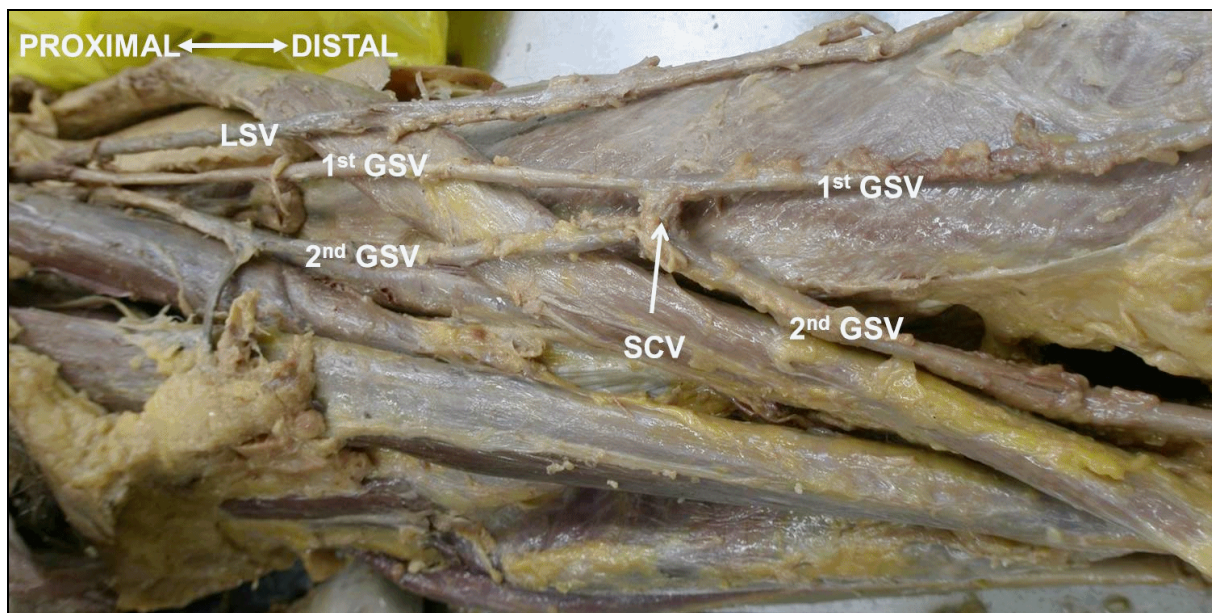


Figure 2 - Double great saphenous veins ascending medially in thigh. After a mid-thigh communication, both saphenous veins become hypoplastic and drain into femoral vein via a single trunk (LSV. Lateral saphenous vein, 1st GSV. First great saphenous vein, 2nd GSV. Second great saphenous vein, SCV. saphenous communicating vein).

DISCUSSION

Historically, anterior and posterior accessory saphenous veins are short veins superficial to the saphenous fascia, which run parallel to the great saphenous vein. They have variable incidence (Daseler et al, 1946), but serve as a communication in cases of obstruction. On presentation great saphenous venous variability differs from accessory veins in their anatomical features: great saphenous variations show a complete course throughout the entire lower limb. Based on series case reports of double great saphenous veins there appears to be an association with varicosity (Kosinski, 1926; Glasser, 1943; Daseler et al, 1946; Haeger, 1977). The incidence of double great saphenous vein ranges from 1% to 52% (Shah et al, 1986), with the incidence of duplication from thigh to calf being 19.41% (20 of 103 cases). Based on a recent review study done by Kockaert et al (2012), the double saphenous vein incidence ranges from 1% to 20% whereas his investigation shows this incidence ranges from 1.6% to 2% . A double saphenous vein system of the entire lower limb is rare with an occurrence of 0.97% (1 of 103 cases) in which both veins started independently from the dorsum of the foot crossing the calf region and terminating into anterior thigh region (Corrales et al, 2002): in the present study the incidence was 1.3% (1 of 78 limbs).

Great saphenous vein duplication is more frequent in males than females, and is more common unilaterally than bilaterally and in the thigh than in the leg (Corrales et al, 2002). In the current study, the duplication was unilateral and in a male cadaver.

Varicose veins frequently occur unilaterally, mainly in females and involve the great saphenous vein (García-Gimeno et al, 2009). Furthermore, hypoplasia of the great saphenous vein is reported to occur in the proximal thigh in 3% of healthy limbs (Caggiati and Mendoza, 2004). In the current study, it occurred in 1.3%. Hypoplasia may lead to physiological compensatory dilation of its tributaries; therefore hypoplasia of the great saphenous vein makes it highly predisposed to varicose disease due to the overload on accessory saphenous veins (Caggiati and Mendoza, 2004). In one study it was the lateral accessory saphenous vein that was the cause of the varicosity (Garner et al, 2003). In the current study, the size of the double saphenous veins decreased in size from distal to proximal during its course in the thigh and together with the lateral accessory saphenous vein formed a single trunk which then drained into the femoral vein (Figure 2). Furthermore, there was no medial accessory vein associated with hypoplasia of both great saphenous veins, thereby increasing the risk of varicosity of the lateral accessory saphenous vein in case of removal of one of the duplicate great saphenous

veins. Therefore to prevent varicosity vascular surgeons might help to avoid removing the communications between the vessels to allow blood to flow in different directions.

Therefore, the present study provides additional knowledge for vascular radiologists and surgeons, who might consider using one of them as a replacement option in cardiac surgery. Surgeons also need to be aware of the communications between veins before removing a selected vein to avoid the future development of lower limb varicosities. The observations of this study and the clinical considerations should decrease the complications of lower limb surgery or procedures by increasing the clinician's awareness leading to the prevention of iatrogenic varicose veins.

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ACKNOWLEDGMENTS

We would like to thank the entire staffs working in Centre for Anatomy and Human Identification who provide the necessary facilities for the preparation of the paper as well as King Saud bin Abdulaziz University for Health Sciences.