

# Update in Doppler ultrasound of lower limbs in case of recurrent varicose veins

## **Essay**

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## **LIST OF ABBREVIATION**

<b>AASV</b>	Anterior accessory saphenous vein
<b>ASV</b>	Accessory saphenous vein
<b>CIA</b>	Common iliac artery
<b>CFA</b>	Common femoral artery
<b>CFV</b>	Common femoral vein
<b>CIV</b>	Common iliac vein
<b>DFA</b>	Deep femoral artery
<b>DFV</b>	Deep femoral vein
<b>DVT</b>	Deep venous thrombosis
<b>EIA</b>	External iliac artery
<b>EIV</b>	External iliac vein
<b>EVTA</b>	Endovenous thermal ablation
<b>GV</b>	Gastrocnemius vein
<b>GSV</b>	Great saphenous vein
<b>HZ</b>	Hertz
<b>IIA</b>	Internal iliac artery
<b>IVC</b>	Inferior vena cava
<b>LNVN</b>	Lymph node vein network
<b>LSV</b>	Long saphenous vein
<b>MHZ</b>	Megahertz
<b>PFA</b>	Profunda femoris artery



<b>PA</b>	Popliteal artery
<b>PER A</b>	Peroneal artery
<b>PER V</b>	Peroneal vein
<b>PRF</b>	Pulse repetition frequency
<b>PTA</b>	Posterior tibial artery
<b>PTV</b>	Posterior tibial vein
<b>PV</b>	Popliteal vein
<b>SAPH C</b>	Saphenous compartment
<b>SC</b>	Superficial compartment
<b>SF</b>	Saphenous fascia
<b>SFA</b>	Superficial femoral artery
<b>SFJ</b>	Saphenofemoral junction
<b>SFV</b>	Superficial femoral vein
<b>SN</b>	Saphenous nerve
<b>SSV</b>	Short saphenous vein
<b>SV</b>	Saphenous vein
<b>SPJ</b>	Saphenopopliteal junction
<b>SFA</b>	Superficial femoral artery
<b>US</b>	Ultrasound
<b>VEGF</b>	Vascular endothelial growth factor
<b>VEGF-R</b>	Vascular endothelial growth factor receptor

## Introduction

Ligation and stripping of varicose veins has a recurrence rate of up to 40% at 5 years and 20% of all varicose vein operations are for recurrence (**Ravi et al., 2006**).

The causes of recurrence are technical or tactical in approximately 29% of the cases, whereas neoangiogenesis is responsible for 29% (**Van rji et al., 2004**).

Insufficient or incorrect surgery, e.g. too low ligation at the junction may result in an obvious cause of recurrence, if a long refluxing SFJ stump has been left (**Geier et al., 2008**).

Most of the research on recurrence after varicose vein treatment has focused on the potential pathophysiological mechanisms of neovascularization, which together with progression of the disease is considered to play an important role in recurrence in particular after a classic surgical intervention (**De Maeseneer et al., 2004**).

Postoperative clinical examination after varicose vein operations has a very poor sensitivity and specificity in detecting recurrent venous reflux, and in particular for localizing the source of reflux (**Fischer et al., 2001**).

### **Introduction & aim of work**

Ultrasound study is the most rational method for screening diagnosis in case of abnormal veins of the lower extremities in the post operative period (**tatarchuk, 2011**).

Duplex ultrasound examination is the investigation of choice in the assessment of recurrent varicose veins. It is an ideal non-invasive diagnostic tool, which demonstrates the often complicated anatomy of recurrent veins. In addition, it provides functional information about the patterns of recurrent venous reflux (**Blomgren et al., 2004**).

## **Aim of work**

- To clarify the updated role of Doppler ultrasound in identifying the possible causes and the pattern of recurrent varicose veins of lower limbs.

## Anatomy of Venous System of the Lower Limb

Most of the venous return from the lower extremities is channeled through the deep system. This system communicates with the superficial veins by means of perforating veins, so named because they perforate the musculature that separates the deep and superficial venous system. In normally functioning perforating veins, valves maintain flow in one direction, from superficial to deep. Flow in the opposite direction is always abnormal. Perforating veins are most numerous below the knee and are of clinical importance if incompetent, permitting blood to flow from the deep to the superficial system. Perforator incompetence may be associated with superficial varicosities, as well as discoloration, thickening, and ulceration of the skin (*Zwiebel et al., 2005*).

**The lower limb venous system is divided into three groups:**

- 1-Superficial system, which lies outside the deep fascia.
- 2-Deep system, which lies within the deep fascia.
- 3-Perforating system, which passes through the deep fascia and connects the superficial and deep system (*Michael, 2002*).

About 10 – 15 % of the venous drainage of the lower limb is carried by the superficial veins while the deep veins carry out the rest (***Alimi et al., 1994***).

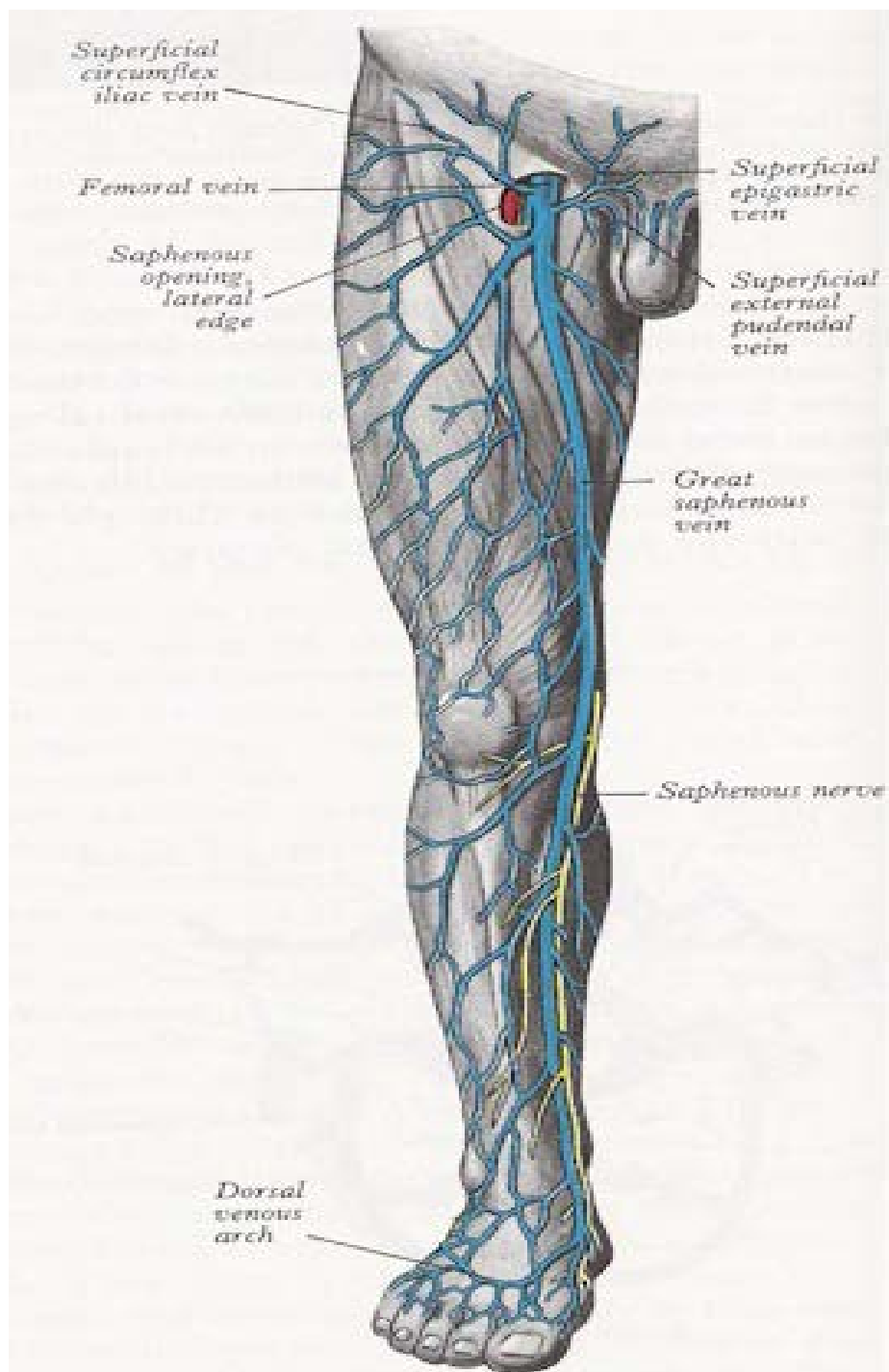
### **1-The superficial venous system of the lower limb**

#### **A) The long or the great saphenous vein:**

Of greatest concern to the physician treating venous diseases in the lower extremity is the great saphenous vein. The term saphenous is derived from the Greek word for "visible" (***Williams, 2005***).

The long saphenous vein is the longest vein in the body. It is formed by the union of veins from the inner part of the foot and the medial marginal vein and runs upwards for 1 to 1.5 inches in front of the medial malleolus of the tibia (figure 1.1) (***Decker et al., 1996***).

It extends obliquely backwards over the subcutaneous medial surface of the lower fourth of the tibia and along the medial border of the leg to the medial condyle of the femur and over the posteromedial aspect of the knee, from here it climbs slightly forwards upon the anteromedial aspect of the thigh to join the common femoral vein at the groin (***Dodd et al., 1996***).



**Figure (1.1):** Anatomy of the great saphenous vein (*Gray et. al., 2005*).