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

Essay

Submitted by

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Acknowledgment

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Moataz Metwally

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LIST OF ABBREVIATION

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

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

Anatomy & physiology

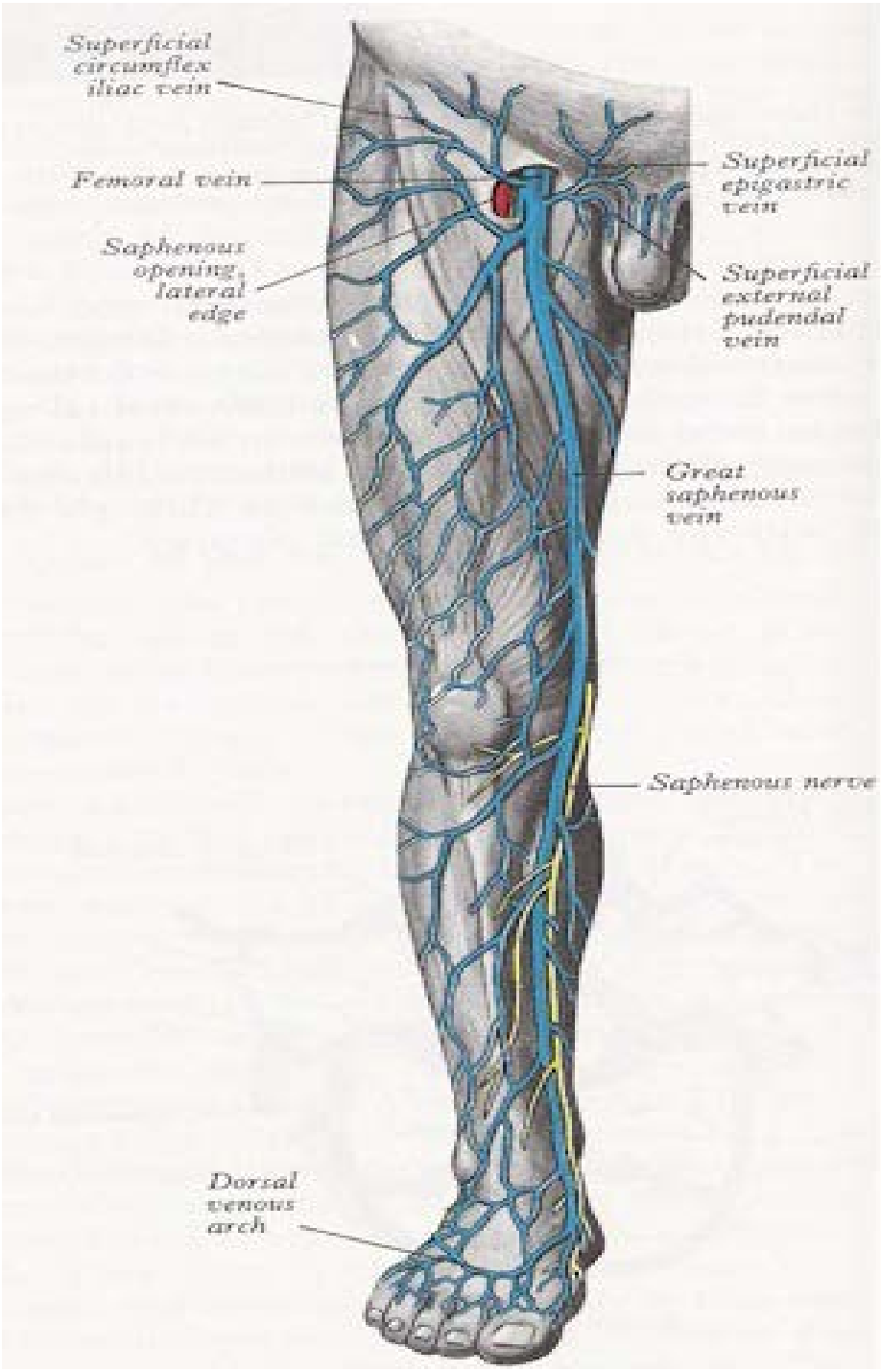

Figure (1.1): Anatomy of the great saphenous vein ***(Gray et. al., 2005).***