Radiofrequency Ablation of the Great Saphenous Vein versus Conventional Surgery in Treatment of Venous Ulcers

Thesis

Submitted for Partial Fulfillment of Master degree in General Surgery

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Mohamed Sami Elsehly

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List of Abbreviations

Abb.	Full term
AASV	*Anterior Accessory Saphenous Vein*
ABI	*Ankle Brachial Index*
CEAP	*Clinical, Etiological, Anatomical, pathological*
CT	*Computed Tomography*
CVD	*Chronic Venous Disease*
CVI	*Chronic Venous Insufficiency*
DVT	*Deep venous Thrombosis*
EVLA	*Endo Venous Laser Ablation*
GSV	*Great Saphenous Vein*
L&S	*Ligation & Stripping*
MDCT	*Multi-detector CT*
PASV	*Posterior Accessory Saphenous Vein*
PPG	*Photo Plethysmography*
PVs	*Perforating Veins*
RCT	*Randomized Controlled Trial*
RFA	*Radio Frequency Ablation*
SSV	*Short Saphenous Vein*
STS	*Sodium Tetradecyl Sulfate*
SV	*Saphenous Vein*
VCSS	*Venous Clinical Severity Score*

ABSTRACT

Background: Chronic venous disease (CVD) is the most common venous disorder. It is caused by venous hypertension due to either reflux, outflow obstruction or both.

Aim of the Work: To analyze the benefit of Radiofrequency ablation of the great saphenous vein versus conventional surgery in healing of venous ulcers.

Patients and Methods: This randomized controlled clinical trial was conducted in the vascular surgery unit at the study was conducted at Ain Shams University Hospitals and Nasser institute hospital in Cairo under supervision of thesis supervisors with Follow up at 2, 4 and 6 months. The study included 40 patients (20 patient for EVLA & 20 patient for conventional Surgery) suffering from primary varicose veins with venous ulcer. Our range of age was 18-51 years.

Results: The present trial confirmed that both surgery and RFA are highly efficacious. Both resulted in significant decrease in venous ulcer size and improvements in the objective severity of venous disease.

Conclusion: RFA is less time consuming than stripping as regard operation time. As regard hospital stay RFA was done as one day surgery cases as they were done under local anesthesia, in stripping group almost patients discharged on the next day as they had been done under spinal anesthesia.

Keywords: *Radiofrequency Ablation - Great Saphenous Vein - Conventional Surgery - Venous Ulcers*

INTRODUCTION

Chronic venous disease (CVD) is the most common venous disorder. It is caused by venous hypertension due to either reflux, outflow obstruction or both ***(Chiesa et al., 2005).***

The treatment of patients with varicose veins results in a considerable workload and financial burden. Visible varicose veins occur in up to 40% of men and 32% of women. This resulted in approximately 37, 500 operations being performed in the year April 2005 to March 2006 in England alone. Approximately 20% of these operations are for recurrent varicose veins ***(Brittenden et al., 2015).***

The frequency of more severe chronic venous signs like eczema, pigmentation, lipodermatosclerosis or venous ulceration reaches a prevalence of about 3% in men and women. Varicose vein without skin changes can be found in about 20% of general population. Cosmetic concern related to varicose vein themselves and any skin changes ***(Nael and Rathbun, 2009).***

Diagnosis of primary varicose veins: By patient history, physical examination and duplex scanning has become the method of choice for the investigation of venous reflux. It combines the assessment of anatomic structure and the function evaluation of blood flow to enable quantification of reflux duration in specific superficial and deep vein segments. In addition, as a non-invasive and repeatable method of measurement ***(Weiss, 2001).***

Treatment of primary varicose veins: Conservative measures include leg elevation to reduce oedema, venotonic drugs and elastic stocking. Sclerotherapy either traditional injection or foam sclerotherapy. Measures include stripping with early and late complications. Endovenous measures include radiofrequency and laser ablation ***(Mao et al., 2012).***

Venous ulcer, also known as stasis ulcer, is the most common etiology of lower extremity ulceration. Venous ulcers are often recurrent. Open ulcers can persist from weeks to many years ***(Briggs and Nelson, 2003).*** Although the overall prevalence is relatively low, the refractory nature of these ulcers increase the risk of morbidity and mortality, and have a significant impact on patient quality of life ***(Ruckley, 1997).***

The primary risk factors for venous ulcer development are older age, obesity, previous leg injuries, deep venous thrombosis, and phlebitis. On physical examination, venous ulcers are generally irregular, shallow, and located over bony prominences ***(Abbade and Lastória, 2005).***

Conventional treatment of the incompetent great saphenous vein has been surgical high ligation and stripping, combined with local phlebectomies. During the past decade, minimally invasive techniques, including ultrasound-guided foam sclerotherapy (UGFS) and endovenous laser ablation (EVLA) have gained popularity in the treatment of varicose veins, and have largely replaced surgery ***(Venermo et al., 2016).***

Aim of the Work

The aim of this work is to analyze the benefit of Radiofrequency ablation of the great saphenous vein versus conventional surgery in healing of venous ulcers.

Chapter 1
SURGICAL ANATOMY OF THE LOWER LIMB VENOUS SYSTEM

Veins of Lower Limb

The veins may be classified into three groups: superficial, deep and perforating which passes through the deep fascia and connects the deep and superficial system ***(Michael et al., 2002).***

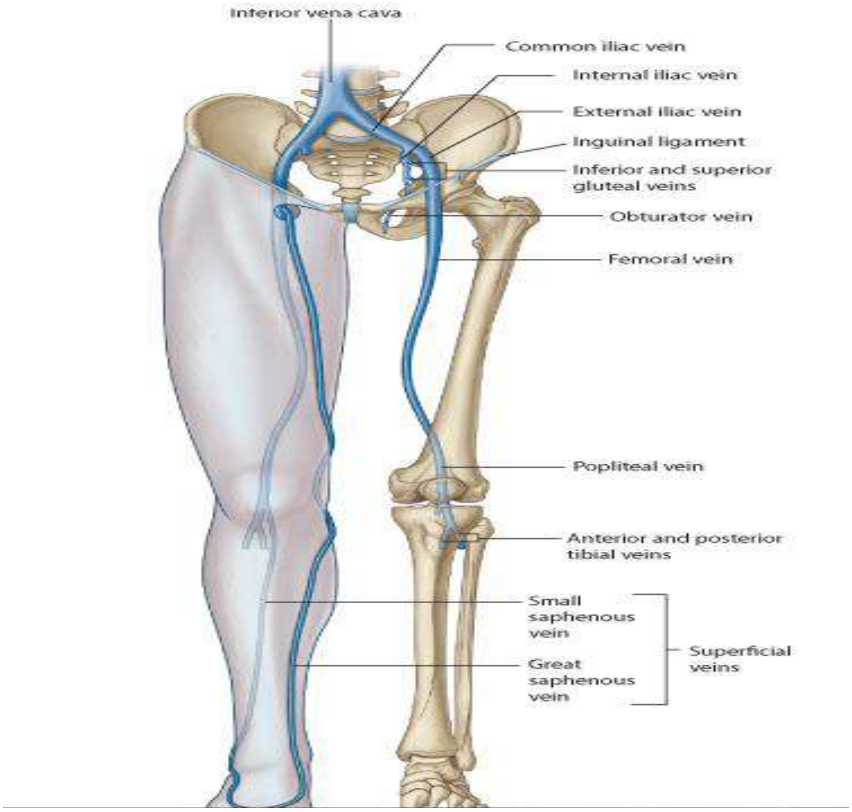

Figure (1): The venous network of the lower limb ***(Gray, 2005).***

Superficial Veins

Superficial veins lie in the superficial fascia, on the surface of deep fascia. Superficial veins include the great and small saphenous veins, and their tributaries. Distal parts of the veins contain more valves than proximal. A large proportion of their blood is drained into deep veins through the perforating veins ***(Standring S, 2005).***

1. The long or the great saphenous vein: (Saphena magna)

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 ***(Decker et al., 1996).***

It extends upward along the antero-medial aspect of the leg and thigh to join the common femoral vein at the groin. joins the femoral vein at the saphenous opening 4 cm below & lateral to the pubic tubercle ***(Dodd and Cockett, 1996).***

The typical ultrasonic “saphenous eye” appearance of GSV in the mid-thigh level marks as the easiest diagnostic approach of its location while the “Egyptian eye” view which shows the appearance of GSV in the transverse view between the superficial and deep fascia is used to distinguish the GSV

from other tributaries. It contains about 10-20 valves. There is one valve that lies just before the vein pierces the cribriform fascia and another at its termination into the femoral vein ***(Ramesh Rao, 2013).***

Morphologically, duplicated GSV and persistence of accessory GSV are two most clinically significant anatomical variations of GSV ***(Chen et al., 2009).***

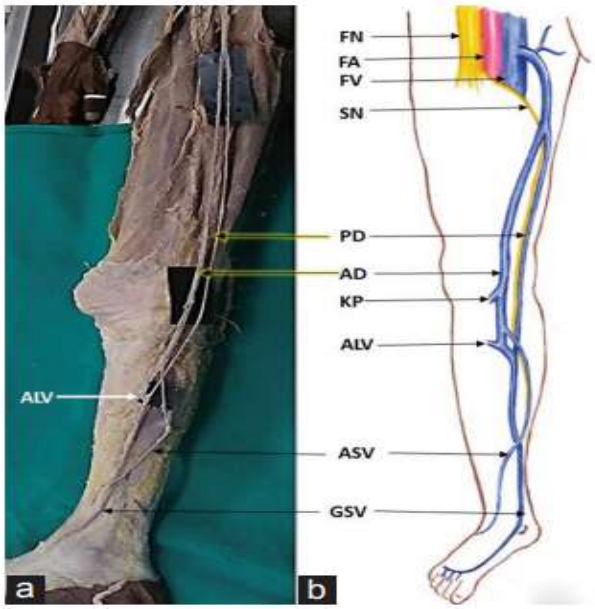

Figure (2): Gross morphology (a) with a comparative schematic diagram (b) showing the bifurcation of the great saphenous vein into anterior and posterior divisions; the presence of anomalous superficial vein. Knee perforator vein and anterior leg veins draining into anterior division. FV=Femoral vein, FN= Femoral nerve, FA= Femoral artery, SN= Saphenous nerve.