The Role of Duplex Guided Foam Sclerotherapy in Management of Great Saphenous Vein Varicosities

Thesis

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By

Morad Raouf Sallam

Supervised by

Prof. Hussein Kamal El Din
Professor of general surgery
Faculty of Medicine
Cairo University

Prof. Hussein Mahmoud khairy
Professor of general surgery
Faculty of Medicine
Cairo University

Asst. Prof. Khaled El Kaffas
Assistant Professor of Radiology
Faculty of Medicine
Cairo University

Asst.Prof. Ahmed Sayed Mostafa
Assistant Professor of general Surgery
Faculty of Medicine
Cairo University

Faculty of Medicine
Cairo University
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List of Abbreviations

HRQOL	Health-Related Quality Of Life
QoL	Quality Of Life
GSV	Great Saphenous Vein
SSV	Small Saphenous Veins
LSV	Long Saphenous Vein’
UIP	Union Of Phlebology
AASV	Anterior Accessory Saphenous Vein
SFJ	SFJ—Saphenofemoral Junction
SPJ	Saphenopopliteal Junction
CVD	Chronic Venous Disease
DVT	Deep Vein Thrombosis
IPVs	Incompetent Perforating Veins
CVI	Chronic Venous Insufficiency
CEAP	Clinical, Etiological, Anatomic, And Pathophysiological
VCSS	Venous Clinical Severity Score
VSDS	Venous Segmental Disease Score
VSS	Venous Severity Scoring
VDS	Venous Disability Score
CIVIQ	Chronic Venous Insufficiency Questionnaire
VEINES	Venous Insufficiency Epidemiological And Economic Study

AVVQ	Aberdeen Varicose Vein Questionnaire
CXVUQ	Charing Cross Venous Ulceration Questionnaire
HHD	Hand-Held Doppler
SVI	Superficial Venous Insufficiency
AAGSV	Anterior Accessory Great Saphenous Vein
PWD	Pulse Wave Doppler
PV	Perforating Vein
DUS	Duplex Ultrasound
UGFS	Ultrasound-Guided Foam Sclerotherapy
EVLT	Endovenous Laser Therapy
RFA	Radiofrequency Ablation
LMWHs	Low-Molecular Weight Heparins
RFA	Radio Frequency Ablation

ABSTRACT

Varicose veins is a very common problem all over the world. Surgery has been the gold standard treatment for many years, however now other less invasive options are available and sometimes more efficient.

The aim of this study was to present the technical aspect of the DGFS, and evaluate its efficiency in the management of GSV varicosities.

In this prospective study, 45 patients presenting to Kasr el Aini hospital with Great saphenous vein varicosities were treated by DGFS on outpatient basis. Foam was generated by the *Tessari* method using Policonadol 3% as sclerosent material.

One week, and 6 months post intervention follow up using clinical examination and duplex scanning was used to asses outcome and detect complications.

After 6 months period all the patients showed clinical improvement evident by significant improvement of the venous severity score. On duplex scanning 89% of the patients showed complete obliteration of the GSV and 11 % showed partial occlusion with no evidence of reflux. However 18% of patients needed reinjection during this period for one or more times to achieve this result.

No major complications were detected in this study however 20% of patients had some skin pigmentation and only 1 patient (2%) had thrombophlebitis and another one had DVT.

Key Words :

Foam Sclerotherapy - Varicose veins - Duplex guided - Great saphenous vein - Mini-invasive techniques .

INTRODUCTION

Lower extremity venous insufficiency is common and increases with age. In addition to classical symptoms, it may result in skin changes and venous ulcers. Chronic venous insufficiency has a great impact on patients' health-related quality of life and is associated with considerable health care costs ***(Nijsten et al., 2009).***

Surgical ligation of the junction with or without stripping has been the standard of care in the treatment of insufficient great and small saphenous veins. However, the recurrence rates are relatively high and surgery may be associated with serious adverse events and considerable down time; it is also cosmetically suboptimal. To improve efficacy, patients' health-related quality of life (QoL) and treatment satisfaction and to reduce serious side effects, costs, and postoperative pain, several minimally invasive techniques have been introduced in the last decade ***(Nijsten et al., 2009).***

Looking into some statistical figures, which reflect the magnitude of the problem, it's obvious that there is some variation according to region, however still is a very common problem all over the world. For instance in ***1994*** a British study by ***Callam*** showed that half of the adult population has stigmata of minor venous disease, and about 25% of the population has lower extremity varicose veins. More than 25% of people with varicose veins have insufficiency of the truncal veins of the legs.

Since varicose veins increase with age in a linear manner, the prevalence of venous insufficiency will increase considerably. Classic

symptoms of venous insufficiency are aching, discomfort, edema, and muscle cramps. Associated complications are eczema, lipodermatosclerosis, white atrophy, superficial thrombophlebitis, and venous ulcers. Venous ulcers have a prevalence of 1% to 2% in people older than 65 years of age ***(Margolis et al., 2002).***

Chronic venous insufficiency has a great impact on patients' health-related quality of life (HRQOL), which is comparable to other common diseases, and is associated with considerable health care costs ***(Nijsten et al., 2009).***

A new treatment for primary varicose veins should be minimally invasive and capable of being used on primary and recurrent varicose veins so that it can be repeated as required. There should be few significant complications and the treatment should have good efficacy in abolishing venous reflux in saphenous trunks, perforating veins and varices. Such a treatment should restore normal venous function and cure the clinical features of venous hypertension. The treatment should be accomplished at little cost and be capable of achieving both functional and cosmetic improvement with little time away from the patient's usual occupation. Surgical treatment does not comply with this definition, since it is relatively invasive and necessitates time away from work ***(Coleridge Smith et al., 2009).***

Primary varicose veins are commonly treated by saphenous stripping combined with phlebectomy of saphenous tributaries and ligation of incompetent perforating veins. The rate of recurrence of varicose veins after 5 years has been reported to vary from 20% to 80% ***(Kostas et al., 2004).***

The use of duplex ultrasound in the treatment of varicose veins allows alternative strategies to be used. Methods such as endovenous laser ablation; radiofrequency ablation and foam sclerotherapy have been increasingly used in these patients. Ultrasound-guided foam sclerotherapy has been considered particularly attractive because it avoids the need for general anaesthesia, hospital admission and long recovery times ***(Van den Bos et al., 2009).*** Few studies have been designed to compare conventional surgery and endovascular methods for the treatment of varicose veins ***(Figueiredo et al., 2009).***

Going back to the history of using Sclerotherapy to treat varicose veins, we will notice that it gained a reputation for lack of efficacy in the latter part of the 20th century, at least in part, thanks to the work of Hobbs published in 1984. His 10-year randomized controlled study showed that the clinical recurrence of varices was common in patients with truncal saphenous reflux managed by sclerotherapy ***(Coleridge Smith et al., 2009).***

Hobbs (1984) found that after 10 years, 71% of patients treated surgically for truncal saphenous incompetence had a good outcome compared with only 6% of patients treated by sclerotherapy. Recent scientific evidence has shown that liquid sclerotherapy is not very effective at eliminating truncal saphenous incompetence and failure to achieve abolition of reflux leads to early recurrence of varices.

Advances in technology led to improvements in the practice of sclerotherapy. In the 1980s ultrasound was introduced for the diagnosis of venous disease of the lower limb. In France, this ***Schadeck and Vin (1991)*** to improve the efficacy of their treatment using ultrasound

imaging to guide the placement of injections into incompetent saphenous. However, this treatment was not as successful as had been hoped.

In ***1991 Bishop*** examined a series of 55 patients in whom 89 legs had been managed by ultrasound-guided liquid sclerotherapy. He found that 57% showed residual saphenofemoral reflux and 75% of patients had great saphenous vein (GSV) reflux. The problem of recanalization of veins was encountered in up to one-quarter of patients at one year according to ***Kanter and Thibault (1996).***

The next significant advancement came in ***1995*** when ***Cabrera et al.*** suggested that foam could be created using carbon dioxide mixed with a polidocanol, a detergent sclerosant. This invention built on the work of several previous authors who had experimented with various types of foam. Foote described a method of foam sclerotherapy in 1944, which was improved by Orbach in 1950 who published a paper describing the use of a foam which he created by vigorously shaking a syringe containing air and sclerosant to produce a froth. ***Cabrera*** used sclerotherapy with foam, guiding his injections by ultrasound imaging. He called his invention 'microfoam', comprising very small bubbles in contrast to the large bubble froths that had been used previously.

Cabrera et al. published a further article in ***1997*** describing his experience in 261 legs with great saphenous varices and eight patients with vascular malformations. Some of the varicose veins reached 20 mm in diameter. He considered that foam greatly extended the range of vein sizes which could be managed by sclerotherapy. He felt that the increased efficacy of foam was attributable to it displacing blood from the treated vein and increasing the contact time between the sclerosant and the vein.

In the intervening years, several clinical series and one randomized clinical trial have confirmed that foam sclerotherapy is effective in managing truncal saphenous incompetence. No detailed follow-up beyond three years has been published ***(Coleridge Smith et al., 2009).***

Aim of The Study:

1. Illustrate the technical aspects of duplex guided foam sclerotherapy in the management of great saphenous vein varicosities

2. Identify possible complications of duplex guided foam sclerotherapy.

3. Illustrate and compare the results of duplex guidedsclerotherapy to open surgery in managing the great saphenous vein varicosities as regards the outcome and the complications.

ANATOMY

Venous anatomy is very variable in some parts but more constant in other parts of the lower limbs. Common variations in lower limb venous anatomy are described in this section, for it is necessary to understand them correctly to identify veins and diagnose disease using ultrasound imaging ***(Cavezzi et al., 2006).***

Thorough knowledge of the fascial compartments of the leg is a prerequisite of understanding the relationship between superficial and deep veins. The fascia surrounding the calf and thigh muscles separates two compartments: the superficial compartment, consisting of all tissues between the skin and the fascia, and the deep compartment, which includes all tissues between the fascia and the bones **(Figure 1).**

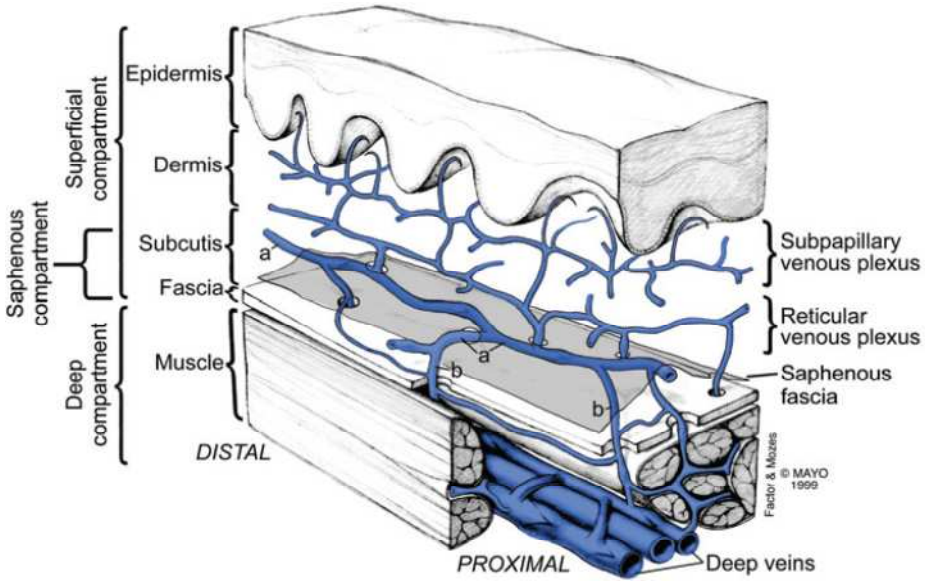

FIGURE 1: *Relationship between the fascia and veins of the lower extremity. The fascia covers the muscle and separates the deep from the superficial compartment. Superficial veins (a) drain the subpapillary and reticular venous plexuses, and are connected to deep veins through perforating veins (b). The saphenous fascia invests the saphenous vein. The saphenous compartment is a subcompartment of the superficial compartment.**(Bergan, 2007).***