بسم الله الرحمن الرحيم

Evaluation of Radiofrequency Ablation in the Management of Primary Varicose Veins

Essay

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In General surgery

By

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Abbreviations

3D	Three Dimenion
AASV	Anterior Accessory Saphenous Vein
APG	Air Plethysmo Graphy
AV	Arterio Venous
AVP	Ampulatory Venous Pressure
CEAP	Clinical,Eitiological, Anatomical,Pathological Grade
CFA	Common Femoral Artery
CFV	Common Femoral Vein
CT	Computed Tomographic
CTV	CT Venography
CW	Continous Wave
DVT	Deep Venous Thrombosis
EVL	Endovenos Laser
EVLT	Endovenous Laser Therapy
GSV	Great Saphenous Vein
LEED	Linear Endovenous Energy Density
LSV	Long Saphenous Vein
MDCT	Multi Detected CT
MRV	Magnetic Resonance Venography
PASV	Posterior Anterior Saphenous Vein
PTV	Pre Terminal Valve
RER	Rough Endoplasmic Reticulum
RFA	Radio Frequency Ablation
SFJ	Sapheno Femoral Junction
SMCs	Smoth Muscle Cells
SPG	Sapheno Popliteal junction
SSV	Small Saphenous Vein
STS	Sodium Tetradecyl Sulphate
TA	Tumescent Anesthesia
TE	Thigh Extention
TEM	Transmission Electron Microscope

TUS	Triplex Ultrasound
TV	Terminal Valve
UGFS	Ultrasound Guided Foam Sclerotherapy

Introduction

Varicose veins are one of the most common conditions requiring surgical treatment; in adult western population visible varicose veins are present in 20-25 % of women and 10-15 % of men. Common symptoms attributable to varicose veins include poor cosmoses, ache, itching and less common symptoms include haemorrhage, varicose ulcer and thrombophlebitis ***(Bartholomew et al., 2005).***

Over the centuries surgery was the standard treatment of varicose veins, drawbacks, to surgery include surgical and anaesthetic risk, postoperative ecchymosis, length of recovery, significant infection rate. High incidence of postoperative parasthesia, pain and recurrence of varicosities which may be as high as 70 % at 10 years ***(Winterborn and Earshaw, 2006).***

The challenge for surgeons dealing with varicose veins has always been balancing a cosmetically acceptable results with a low incidence of recurrence and complications ***(Teruya and Ballard, 2001)***

Less invasive treatment modalities seek to reduce risk and morbidity. These include radiofrequency ablation, endovenous laser therapy, transilluminated power phlebectomy and foam sclerotherapy.

Represent effective and possible superior alternatives to traditional saphenous vein stripping and stab avulsion of varicose veins ***(Teruya and Ballard, 2001).***

The underlying principle of RFA involves the delivery of thermal energy derived from an electric current to the venous segment to be treated. This is achieved using a bipolar endovenous catheter with a typical power of 2–4 W, which is used to generate temperatures of 85–1208C. As the procedure relies on direct contact between the RFA catheter and the vein wall, it is essential that the vein is emptied of blood during ablation (achieved using Trendelenberg position, use of

tumescent anaesthesia and extrinsic compression). There is an in-built feedback mechanism, which evaluates the vein wall impedance and can adjust the energy delivery accordingly to ensure that the fibre temperature remains consistent ***(Gohel and Davies, 2009).***

RFA is established as an acceptable and efficacious endovenous treatment modality for the treatment of varicose veins. Although many treatment variables are highly dependent on clinician preference, principles for the safe introduction of a RFA service and standards of care are proposed in this document. Clinicians performing RFA for the treatment of varicose veins should ensure accurate audit of interventions and outcomes. Further consensus is needed on the optimal post-procedural treatment regimen ***(Zan et al., 2007).***

Aim of the essay

This essay aims to evaluation of the efficacy and safety of radiofrequency in the management of primary varicose veins measured against symptom relief, patient satisfaction and clinical outcome.

ANATOMY OF VENOUS SYSTEM OF LOWER LIMBS

Venous anatomy is very variable in some parts but more constant in other parts of the lower limbs. In the past, a wide range of terms including eponymous names was used to describe lower limb veins. A recent publication by ***Caggiati et al***. unified terminology and definitions for the venous system with particular reference to the lower limb, and the present consensus is based on that presentation. It uses English terms to describe veins rather than less generally used Latin terms or eponymous nomenclature ***(Cavezzi et al, 2006)***.

Historical background:

The fascinating history of venous surgery has been the subject of many reviews and monographs. The first written record of varicose veins and suggestions on treatment were found in the Ebers papyrus around 1550 BC. The first illustration of a varicose vein, discovered in Athens at the foot of the Acropolis, dates back to the 4th century BC. It is a commonly reproduced votive tablet that shows a large leg with a serpentine varicose vein on its medial aspect ***(Majno, 1975)*.**

Fig. (1)*: Votive tablet found at the base of the Acropolis in Athens, the earliest known illustration of varicose veins* ***(Gloviczki, 2006).***

The 15th century brought new interest in venous anatomy, as illustrated in Leonardo da Vinci's drawings of the human body, and in the 16th century, the anatomy of the venous system was presented in great details in the works of Andreas Vesalius ***(Gloviczki, 2006).***

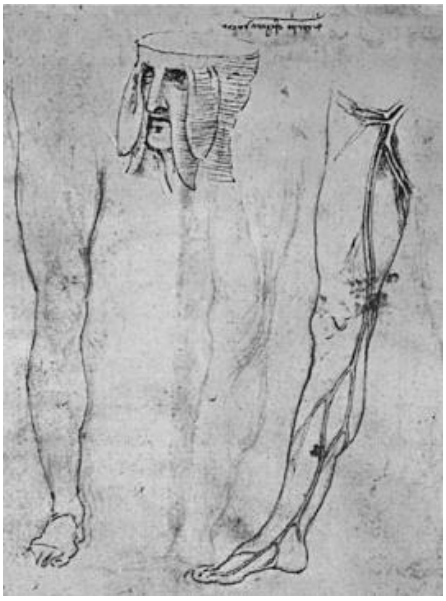

Fig. (2)*: The saphenous vein by Leonardo da Vinci* ***(Gloviczki, 2006).***

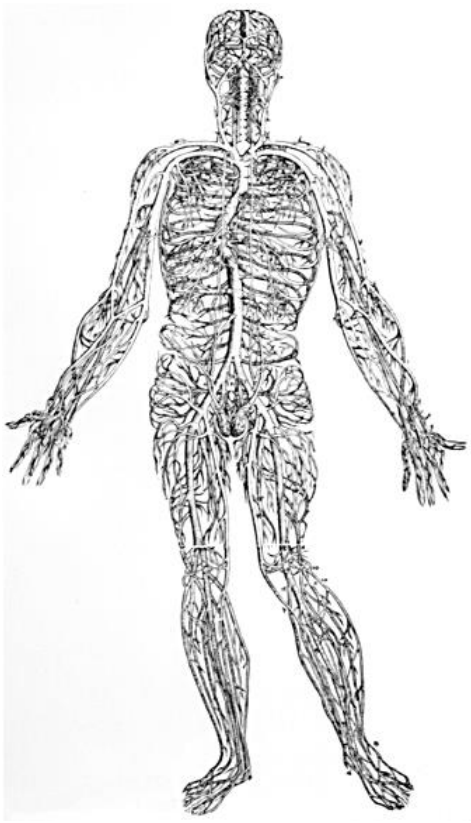

Fig. (3)*: The venous system according to Vesalius (1545)* ***(Caggiati et al., 2006).***

Developmental anatomy:

By the fourth week of the intrauterine fetal life, a swelling of the lateral embryonic body wall forms the limb buds. They are richly vascularized, where the arteries are axial, while the veins are marginal. There are a couple of veins present on each side. The anterior marginal vein is pre-axial and the posterior marginal vein is post-axial; both drain separately into the posterior cardinal vein ***(Williams et al., 1989).***

In the adult life the pre-axial vein of the lower limb become the great or long saphenous vein, which more proximally gives rise to the proximal femoral and the external iliac veins. The post-axial vein becomes the lesser or the short saphenous vein, which more proximally gives rise to the popliteal, inferior gluteal and internal iliac veins as a portion of the posterior cardinal vein ***(Williams et al., 1989).***

Histology (Microanatomy) of the veins of the lower limbs:

Veins are characterized by thin wall in comparison to arteries of similar size and by large capacitance. Wall thickness is not correlated exactly to the size of the vein, e.g. the wall is thicker in veins of the leg than it is in veins of a similar size of the arm ***(Gray's, 2005).***

Veins have walls consisting of three concentric layers:

1. The intima (tunica intima), is the inner most layer. Its main component, the endothelium which is a monolayer of flattened polygonal cells.
2. The media (tunica media), is made of muscle tissue, elastic fibers and collagen.
3. The adventitia (tunica adventitia), is the outer coat of the vessel, and consists of connective tissue, nerves and vessel capillaries. It links the vessel to the surrounding tissues ***(Gray's, 2005)***