MANAGEMENT OF PRIMARY VARICOSE VEINS

ESSAY

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By

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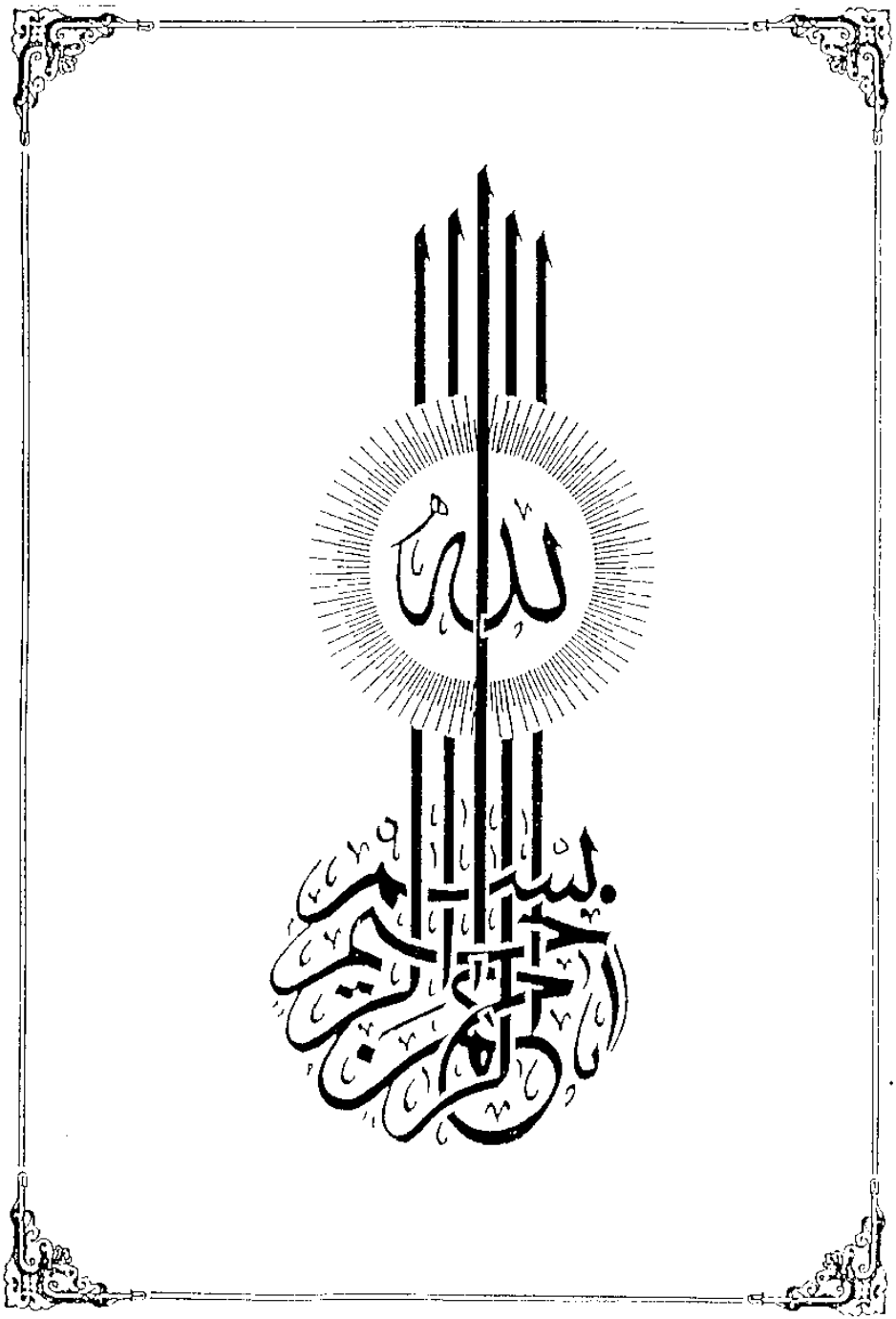

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INTRODUCTION

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Varicose veins and their complications are a common problem, specially so in the Western people; probably one in five women and one in fifteen men over the age of forty-five have them. Because the aetiology is not known, there is no prevention and with the greater longevity and increasing age of the population the problem is steadily rising. The incidence of venous diseases increases as native populations are exposed to western civilisation.

(Hobbs, 1977)

It has been estimated that there are ten times as many sufferers from chronic venous disease of the lower extremities as from arterial disease with leg symptoms. In spite of this, patients are mostly not considered to be suffering from a serious disorder and in most hospitals they are often seen and treated by younger and least experienced members of the surgical team. Few vascular surgeons take an enthusuastic interest in venous disorders and prefer to concentrate on arterial problems, which though offering more heroic and dramatic surgery, produce results which are often disappointing and sometimes cannot be related to the time and money expended.

(Dodd and Cockett, 1976)

By definition, a varicose vein is one which as a result of continuous dilatation under pressure in the course of time became elongated, tortuous, pouched, thickened, inelastic and friable, the vein loses perminently its valvular efficiency and distention and dilatation, especially in the erect position exagerates this valvular incompetence.

(Anderson and Scott, 1976)

Although primary varicose veins have been recognised for hundreds of years and although attempts at treatment were initially made 3000 years ago in Ancient Egypt and later by Hippocrates, Celsus and Galen in Ancient Greece, surgical techniques can still not be regarded as being standardised. This is reflected in the diversity of surgical methods adopted and in the continuing quest for improved techniques in attempts to avoid recurrence of varices and to obtain the best aesthetic results. (Agrifoglio, 1977)

This essay reviews the current concept of investigations and treatment of varicose veins with some emphasis on the surgical anatomy, applied physiology and etiology to enable one to understand the rationale of various forms of treatment.

REVIEW OF LITERATURE

The Surgical Anatomy of The Venous System of The Lower Limb

Much of the misunderstanding related to the treatment of venous disorders originates from inadequate or incorrect knowledge of the anatomy of the venous system of the lower limb.

Whereas surgeons in many fields have recognized the neccesity of having a sound anatomical knowledge of areas in which they are to operate, this basic philosophy has been frequently ignored in surgery of the venous system.

(Strandness and Thiele, 1981)

The anatomy of the arterial system is relatively constant, that of the venous system is subject to individual variation.

(Dodd and Cockett, 1977)

The veins of the lower limb will be considered under the following headings:

1. The structure of the vein wall.
2. The superficial veins.
3. The deep veins.
4. The valves of these veins.
5. The perforating veins.

1. The Structure of The Vein Wall:

Microscopic inspection of veins from different areas in the lower limb reveals some obvious structural difference. The wall of the superficial veins is thicker than those of the deep system with the greater saphenous vein exhibiting the greatest wall thickness. In situ examination discloses a greater capacity for vasospasm than the veins of the deep system, which in comparison have a much thinner wall and a larger lumen.

(Le Gros Clark, 1980)

The wall of the veins, like that of the arteries, is composed of three coats, the external or adventitia, the middle or media and the internal or intima. The main difference between veins and arteries lies in the comparative weakness of the muscular middle coat of the former.

(Anthony and Parker, 1972)

The external coat consists mainly of collagen fibers, largely longitudinal. In the larger veins it contains bundles of longitudinal, smooth muscle. The adventitia contains tiny blood vessels (vasa vasorium) and sympathetic nerve fibrils.

The middle muscular coat varies considerably between veins of different caliber.

Muscle fibers are well developed in the main superficial veins of the leg, the long and short saphenous, which have considerable contractile power. The media is less well developed in the smaller tributaries of these veins, which are consequently more liable to dilate and become tortuous and varicose in response to sustained high intravascular pressure. In the larger veins which include the upper femoral and the iliac veins, the smooth muscle is much reduced and in the inferior vena cava is entirely lacking. In these veins the adventitia to some extent takes over the function of the media.

The internal coat or intima consists of endothelial cells which, in the medium sized and large veins, is supported on a subendothelial layer of connective tissue. This layer is lacking in the venules and small veins. An internal elastic lamina is present in the subendothelial layer of the larger veins.

En face electron microscopy shows a pavement-like appearance of the endothelial cells which are separated by narrow intercellular junctions. They are extremely sensitive to both physical and chemical trauma but also demonstrate a marked capacity for regeneration.

In the media interspersed between the smooth muscle cells is a loose netwrok of collagen and elastin, with the elastin having a predominantly longitudinal orientation. In comparison to the arterial wall, the concentration of smooth muscle and elastin is substantially less in veins and this explains the difference in the stress strain characteristics of veins.
(Strandness and Thiele, 1981)

The Superficial Venous System

The superficial veins lie in the subcutaneous fat where they are observable in three strata. First, the thin-walled subcuticular vessels or venules, which form a considerable plexus under the skin. In varicosis venules in the skin become visible. These venules join to make a network of larger subcutaneous veins of moderate size, and are the veins which form most of the prominent superficial varices following incompetence of the main trunks. The third layer consists of the main trunks of the long and short saphenous veins which lie on the deep fascia. (Dodd and Cockett, 1976)

In the proximal half of the thigh where the subcutaneous tissues consist of a superficial fatty layer (Camper's fascia) and a deeper membranous layer (Scrapa's fascia), the major venous channels (great saphenous vein) are found deep to the scarpa's fascia. It is this fact which may be responsible for the confusion which can result at operation in locating the saphenous vein. (Thomson, 1982)

Drainage from The Toes and Foot

Each toe has four digital veins, two dorsal and two plantar. The dorsal digital veins join in the toe clefts to form the dorsal metatarsal veins which unite to form a dorsal venous arch. The dorsal arch is linked with medial and lateral marginal veins which run along the inner and outer borders of the foot.

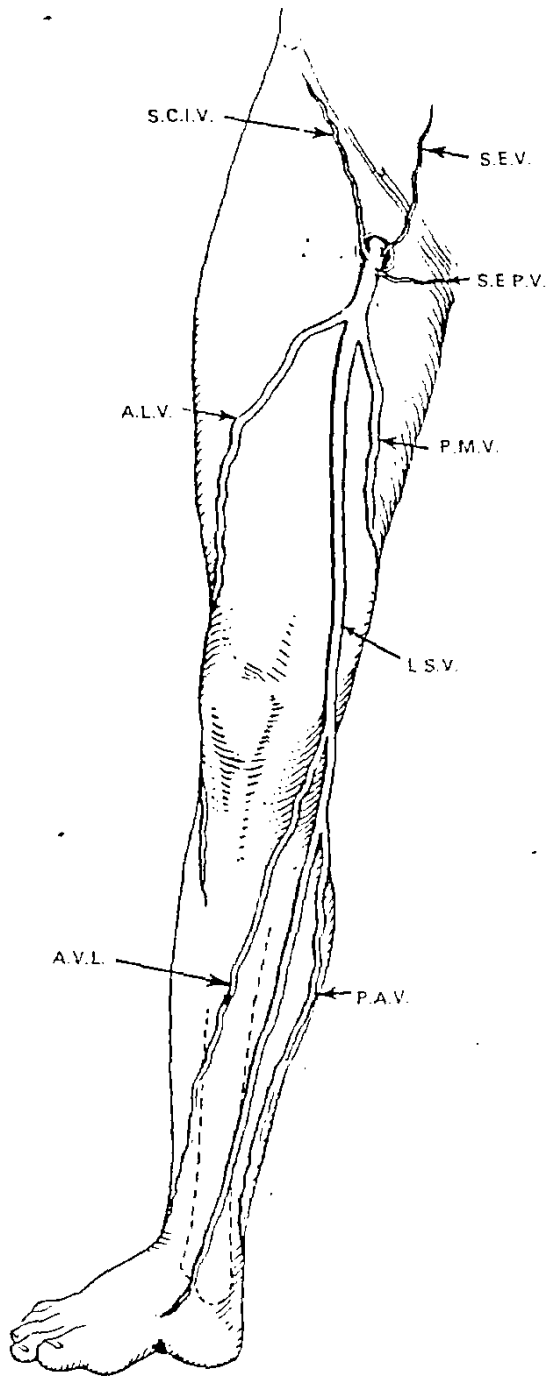

Fig. 1 The internal saphenous vein with its tributaries.
S.C.I.V. = Superficial circumflex iliac vein.
S.E.V. = Superficial epigastric vein.
S.E.P.V. = Superficial external pudic vein.
P.M.V. = Postero-medial vein.
L.S.V. = Long saphenous vein.
P.A.V. = Posterior arch vein.
A.V.L. = Anterior vein of leg.
A.L.V. = Antero-lateral vein of thigh.

(Dodd and Cockett, 1976)

Ultimately the medial part of the dorsal venous arch is continued upwards as the long saphenous vein. The lateral marginal vein, which is less well defined, communicates with the short saphenous vein by way of the venous plexus behind and below the external malleolus.

The plantar digital veins form the four deep metatarsal veins which run between the metatarsal bones and unite to form the deep plantar venous arch.

The dorsal and plantar digital and metatarsal veins communicate with each other freely at the roots of the toes. The plantar digital veins also communicate with the adjacent superficial vessels in the sole of the foot which has numerous connections extending backwards to the veins of the heel, and by twigs to the lateral and medial marginal veins.

The numerous perforating veins of the foot are valved in such a way that most venous drainage from the dorsum passes to the long and short saphenous veins at the ankle and from the plantar surface to the posterior tibial veins.

(Fegan and Pegum, 1968)

The Long Saphenous Vein (Syn. great or large saphenous vein or saphena magna). (Fig. 1)

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 infront of the medial malleolus of the tibia lying in the groove between the anterior border of the medial malleolus and the tendon of tibialis anterior muscle. It extends obliquely backwards over the subcutaneous medial surface of the lower fourth of the tibia and along the medial border of this to the medial condyl of the femur and over the postromedial aspect of the knee. From here it climbs slightly forwards upon the antro-internal aspect of the thigh and into the foramen ovale

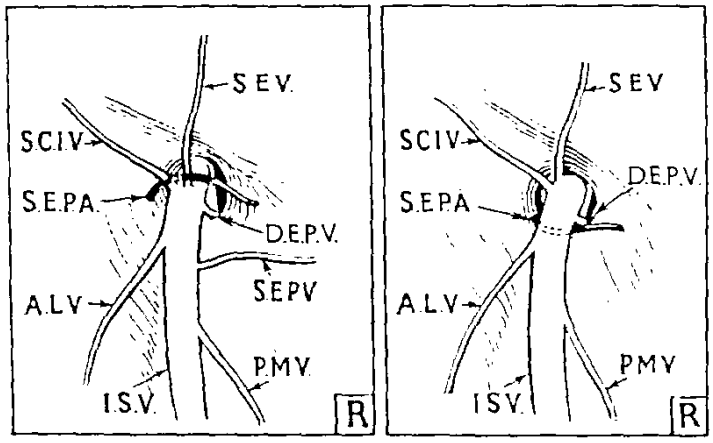

Fig. 2 Relationship of the superficial external pudic artery to the termination of the internal saphenous vein. **(Dodd and Cockett, 1976)**

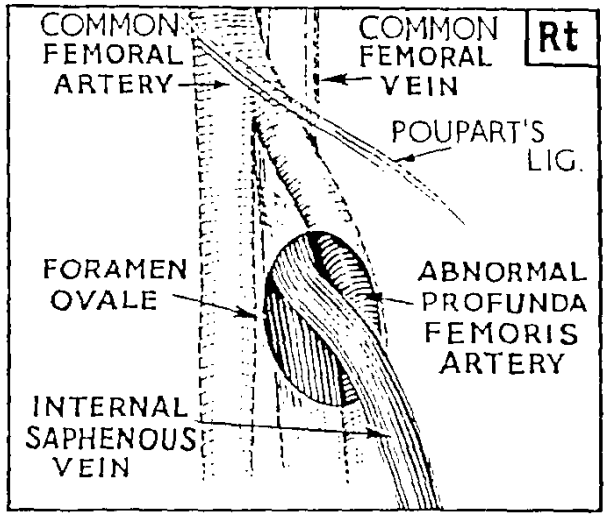

Fig. 3 Abnormally high origin of profunda femoris artery crossing the femoral vein and the termination of the internal saphenous vein. **(Dodd and Cockett, 1976)**