POST TRAUMATIC CHRONIC LEG ULCERS

ESSAY

Submitted for Partial Fulfilment
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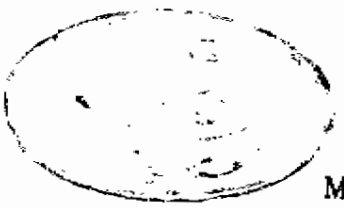

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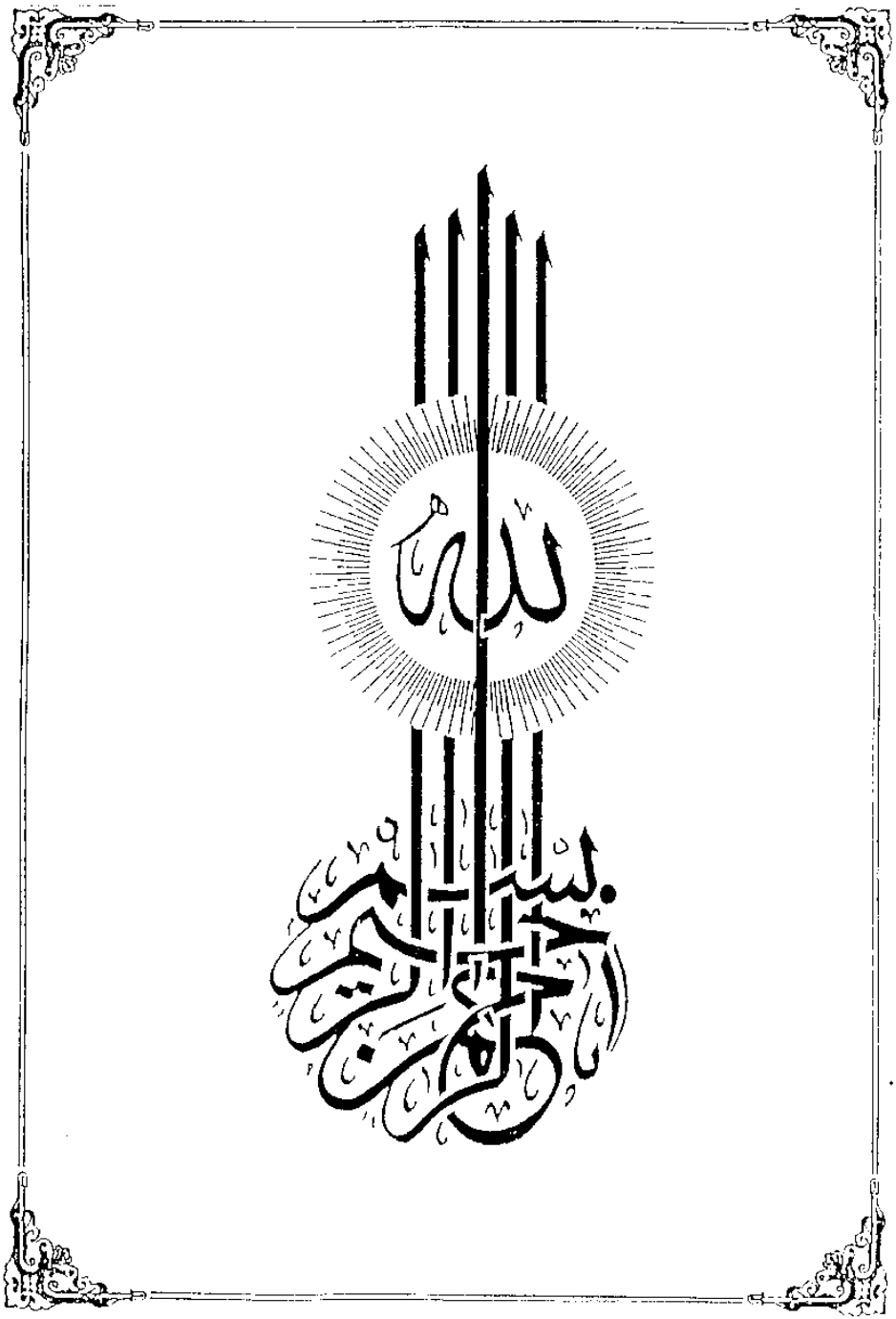
بسم الله الرحمن الرحيم

«وقل رب زدني علما»

صدق الله العظيم



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C O N T E N T S

INTRODUCTION

I N T R O D U C T I O N

Chronic ulcerations of the leg are a serious concern to both physician and patient, as they can present both diagnostic and therapeutic problem to physician. Also they are incapacitating and disabling to the patient (Dahl, 1983).

Kitahama et al. (1982) postulated that the problem of leg ulcer began in ancient times. Hippocrates (460-377 B.C.) who suffered a leg ulcer and enlarged vein, worte "In the case of an ulcer, it is not expendient to stand more especially if the ulcer be situated on the leg".

Amyriad of things can cause a leg ulcer, but the aim of this essay is to discuss the problem of the post traumatic leg ulcer, with special interest in the modern lines of treatment of chronic leg ulcer in general.

ANATOMY OF THE LEG

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Ulcerations of the leg are fairly common and can present both a diagnostic and therapeutic problem to the physician. The surgeon must be aware of the many conditions which can cause ulceration of the leg (Spittell, 1983).

Before we discuss the pathological aspects of different types of leg ulcers, we must have an idea about the normal anatomy and physiology of the leg, which will help to understand the factors which make any lesion at this part of the body very difficult to heal and most probably become a chronic one.

I. The musculoskeletal structure of the leg. (Fig.1):

The tibia and fibula are the two bones present in the leg. They articulate together, with the femur above at the knee joint, and with the talus below forming the ankle joint.

The tibia is the medial one, all its surfaces are covered with muscles except its anterior border and medial surface which are largely subcutaneous.

The fibula is the smaller and lateral one, its head is subcutaneous and rises laterally to form the styloid process. It is completely covered with muscles except its expanded lower end "lateral malleolus" which is subcutaneous (Hollinshead, 1982).

The deep fascia of the leg covers only muscles, being attached to periosteum at all subcutaneous areas of bones. Two intermuscular septa pass from its deep surface to become attached to the fibula. They enclose the peroneal compartment, between the anterior septum and the tibia lies the extensor compartment, while between the posterior septum and the tibia posteriorly lies the flexor compartment.

The deep fascia which covers the anterior compartment is thick particularly proximally where it gives origin to the tibialis anterior, so there is no subfascial plain at that area, but on the medial, posterior, and lateral aspects of the leg fascia is thin with subfascial plain. This point is very helpful in planning the fascial flaps at the leg (Thatte and Laud, 1984).

The subcutaneous surface of the tibia has subcutaneous fat attached to its periosteum. There is no deep fascia covering it, that is why this part is very liable to trauma and ulceration (Last, 1978).

II. Neurovascular supply of the leg:

The popliteal artery at the popliteal fossa divides into anterior tibial artery to the extensor muscles, and the posterior tibial artery which supplies the peroneal and flexor muscles of leg.

The nerve supply to the leg is through the sciatic nerve which gives the common peroneal nerve and the posterior tibial nerve. The common peroneal nerve divides into the anterior tibial nerve to the extensor compartment and the musculocutaneous nerve to the peroneal muscles. The posterior tibial nerve supply the flexor muscles of the leg (Hollinshead, 1982).

III. Blood supply and lymphatic drainage of skin of the leg:

To be able to deal with ulceration of the skin of the leg, we must understand the histological structure of this skin and then take an idea about its blood supply and lymphatic drainage. These informations will be of great help in understanding the reconstructive operations used in the treatment of these ulcers.

1) Histological structure of skin: Fig.(2)

The skin in general consists of two layers, epidermis and dermis. The epidermis is the outer layer, it consists

of different layers of keratinocytes. From within outwards it consists of a) A basal cell layer, b) Several layers of spiny or prickle cells, c) A granular cell layer, and d) Keratinized or horny layer.

The dermis (corium) is the second layer and is composed chiefly of fibrous connective tissue. It is divided into two compartments: A) Adventitial dermis which includes, thin zone adjacent to the epidermis "papillary dermis" and a layer which surrounds adnexal structures periadenexal dermis". B) The reticular dermis located between the above layer and the subcutaneous fat.

The corium contains the blood vessels and nerves to the skin, since the nerve endings that mediate pain are found only in the corium, partial thickness injuries may be extremely painful, whereas full thickness injuries are usually anaesthetic (Burnett, 1981).

2) The anatomy of cutaneous circulation:

- Arterial supply of skin of the leg:

The skin is vascularised from two extensive microvascular plexuses which are, 1) The subdermal plexus, is the deeper and lies in the lower reticular dermis 2) The superficial arterial plexus, which is present in the upper reticular dermis. It arborizes to supply the basal layer

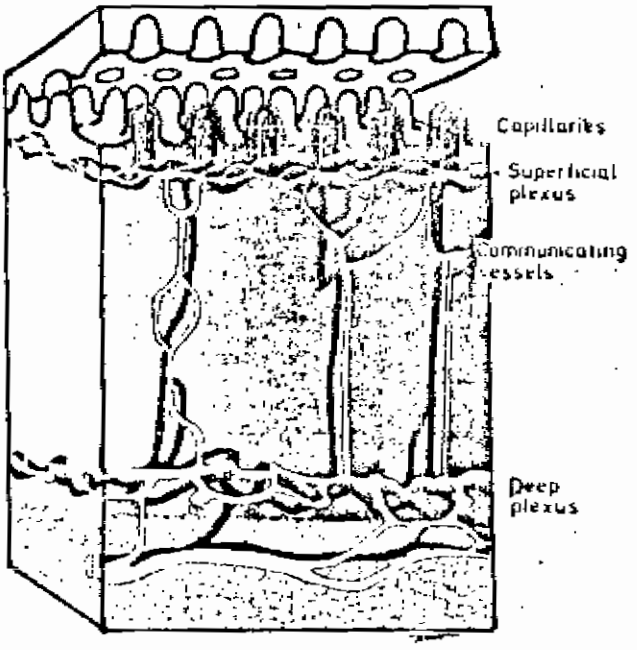

Fig.3: Dermal vasculature. (Quoted from Burnett,1981, p.483).

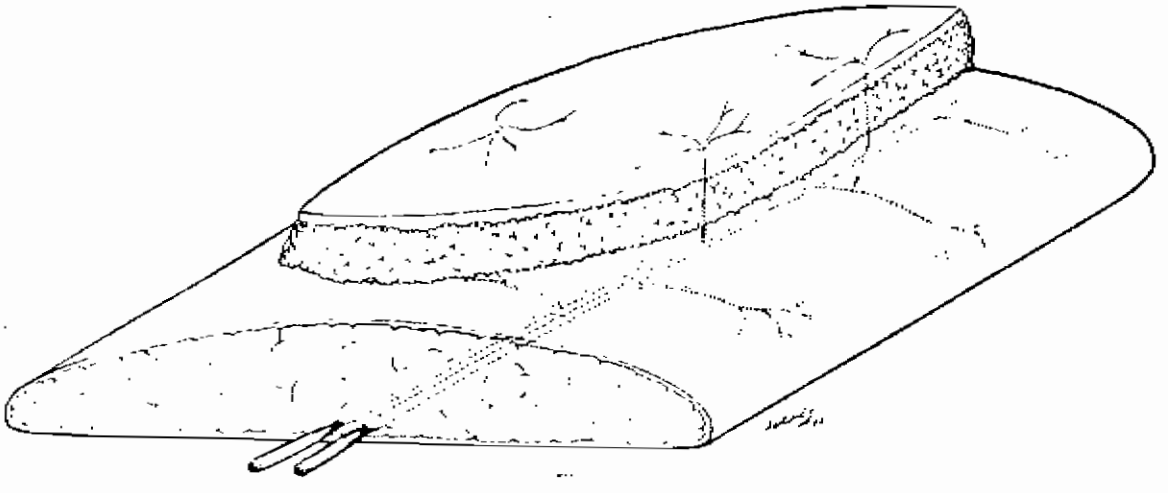

Fig.4: The musculocutaneous system of perforators (Quoted from Cormack & Lamberty, 1984, p.82).

of the epidermis and the dermal appendages. These two plexuses communicate together through vertical channels Fig. (3).

There are two patterns of the distributions of the arterial branches to the subdermal plexus, these are:

1. The musculocutaneous perforating arteries: (Fig.4):

They arise from the underlying muscles and reach the skin after traversing the subcutaneous fascia to provide the richest and extensive arterial circulation of the skin (Orticochea,1983).

2. Superficial cutaneous (axial) arteries (Fig.5):

They arise from an arterial trunk and without supplying any muscle, reach the subcutaneous tissue and follow a longitudinal course parallel to the skin. At variable distances smaller cutaneous branches ascend vertically into the subdermal plexus (Orticochea, 1983).

In the leg the arterial supply tends to course longitudinally subcutaneously after arising from the anterior, posterior tibial and peroneal arteries. It is better on the medial side of the calf, being supplied by the saphenous branch of the highest genicular artery. The medial inferior genicular, and by the posterior tibial artery (Stark, 1962).

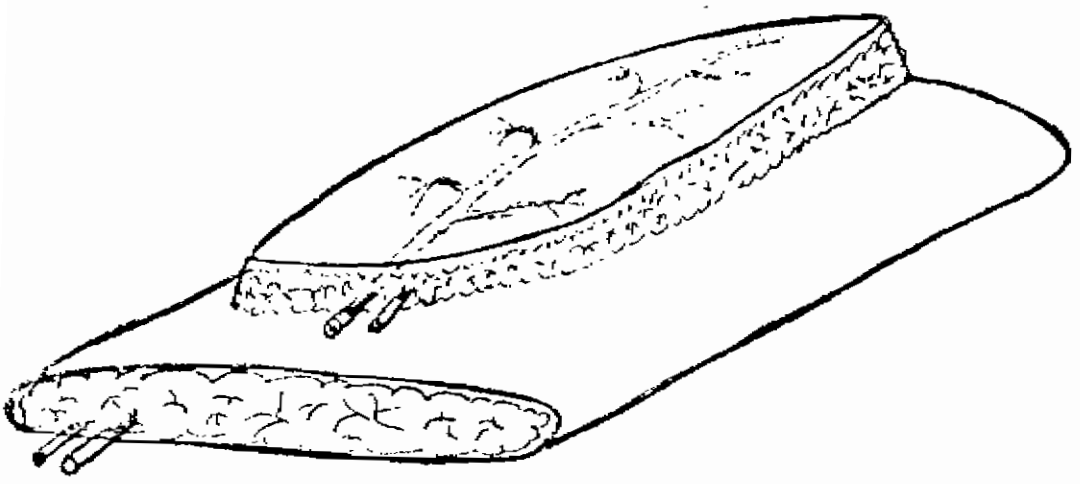

Fig. 5: The direct cutaneous system of vessels. (Quoted from Cormack & Lamberty, 1984, p.81).

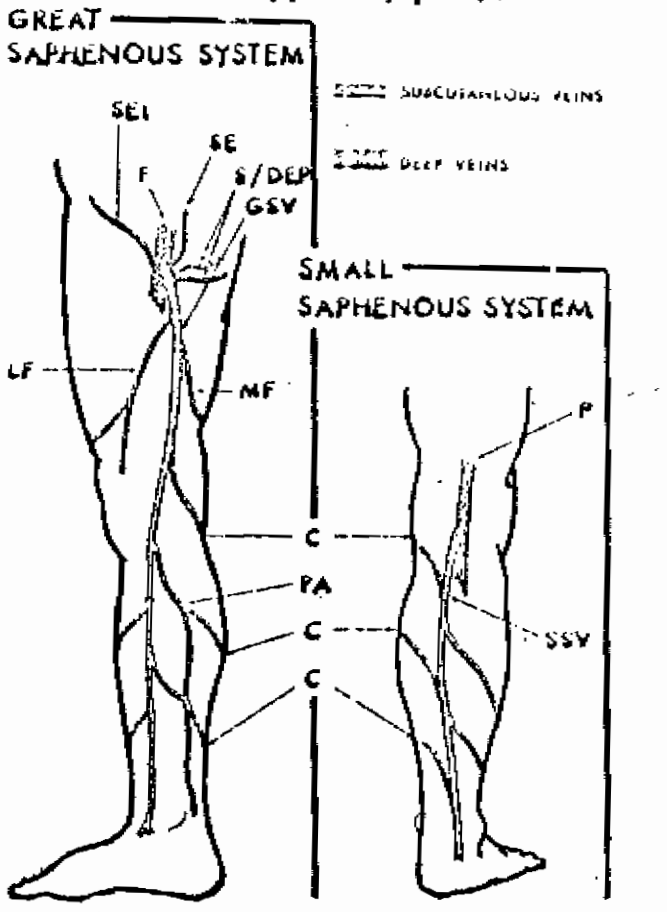

Figure 6: Diagrammatic representation of the course and tributaries of the saphenous veins. *GSV* = great saphenous vein; *SSV* = small saphenous vein; *F* = femoral vein; *P* = popliteal vein; *SEI, SE, S/DEP, LF, MF* = superficial circumflex iliac, superficial epigastric, superficial and deep external pudendal, lateral femoral, medial femoral tributaries; *PA* = posterior arch vein; *C* = short saphenous–great saphenous communicating veins.

(Quoted from Ludbrook and Jamieson, 1977, p. 1820).