RECENT TRENDS IN SURGICAL TREATMENT OF CHRONIC LEG &FOOT ULCER

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التقنيات الحديثة في العلاج الجراحي لقرح الساق والقدم المزمنة

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Dedication

- To those whose always been there for me.
- In my beloved father who tought me to always do my best and expect nothing less.
- To my mother for her support and dedication and who sacrificed for me.
- To my beloved wife.
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(و قل ربي زدني علما)

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Introduction

There is no consensus definition of a leg ulcer. However, one definition that has been widely used is ‘tissue breakdown on the leg or the foot due to any cause‟. (**Cullum, 1994**)

Others have further refined these earlier definition adding ‘that a chronic leg ulcer is defined as an open lesion between the knee and ankle joint that remains unhealed for at least four weeks. (**SIGN, 1998**).

Prevalence studies undertaken both in the UK and internationally, suggest that chronic leg ulceration affects up to one percent of the population, however only 20-25% of people have an open ulcer at any time. (**Graham et al., 2003**)

Prevalence of leg ulceration has been shown to be higher in women, although prevalence increases with age for both genders. (**Margolis et al., 2002**)

Studies suggest that the majority of leg ulcers are associated with venous disease (estimates range from 40 to 80%), but other risk factors can include immobility, obesity, trauma, arterial disease, vasculitis, diabetes and neoplasia. (**Simon et al., 2004**)

Regardless of the pathology, all leg ulcers represent a failure of the underlying vessels to effectively transport blood to and from the lower limbs. Most leg ulcers are slow to heal with up to 68% of cases recurring within a two year period. (**Finlayson et al., 2009**)

Ulceration is a major risk factor for lower extremity amputation. Foot ulcers precede lower extremity diabetic amputations more than 80% of the time. (**Lawrence, 2012**)

There is no single aetiology; however it is thought that approximately 70% of people with a leg ulcer are as result of venous hypertension. Arterial or mixed arterial/venous disease is responsible for a further 20% and the remaining are from other conditions such as diabetes, rheumatoid disease, malignancy and vasculitic conditions. (**Chen & Rogers, 2007**)

Majority of chronic leg ulcer are the result of venous hypertension, arterial insufficiency, or a combination of both. Uncommon causes include lymphoedema, vasculities, malignancy, and pyoderma gangrenosum. (**Moloney & Grace, 2004**)

Careful evaluation of causative and contributory factors is of great importance in the management of patients with leg ulcers. (**Sarker & Ballantyne, 2000**)

The first step in successfully managing a patient with a leg ulcer is recognising the wound as a leg ulcer. Wounds that commonly fall into not being recognised as an ulcer are pre-tibial lacerations (or other trauma wounds) and surgical incisions where veins have been harvested for coronary bypass grafts. (**Moffatt, 2007**)

Severe arterial disease states can be clarified with angiography, e.g., digital subtraction angiography (DSA) or, alternatively, nuclear magnetic resonance imaging (MR-angiography). (**Dissemond et al., 2005**)

Not only is it time consuming and costly to treat, but there are psychological implications to the patient in that the ulcer increases social isolation through limited mobility, uncontrolled exudate and odour, together with pain. (**Lindholm et al.,1993**)

Many surgical techniques and various types of advanced dressings are used for the treament of these ulcers, assuming that the physiologic processes of tissue repair are competent and that the lesion can heal ‘‘spontaneously’’; this occurs quite frequently, but there are ulcers, usually defined as “complex”, which do not heal within an acceptable time frame, despite a correct diagnostic and therapeutic procedure, or relapse rapidly. This may be due to concomitant systemic pathologies (e.g. diabetes, immunodeficiency, cardiac failure) and/or to the presence of local factors (e.g. oedema, arterial or venous failure, infections) that inhibit the healing process. The lack of healing of the ulcer, even for years, affects the whole circumference of the leg, often involving deep structures such as aponeuroses and tendons. In such cases, a reconstructive surgical operation using skin grafts must always be considered, though it may also be difficult or likely to fail because of the position, width, and depth of the lesion(s). **(Silvestro et al., 2013)**

When dealing with large full-thickness wounds of the lower limbs, the use of reconstructive operations with autologous skin grafting is widespread. Epidermis with a superficial part of the dermis is harvested with a dermatome from an undamaged skin donor site and applied to the full-thickness wound. Being applied to the wound, capillaries of the split skin graft (SSG) form anastomoses or “plug in” into the existing capillary network to provide nutrients for graft survival; this is referred to as graft

"take". In the case of an extensive wound, donor sites are limited and in such cases, meshing techniques can be used meaning grafted skin is uniformly perforated and stretched to cover greater areas of the wound. (**Silvestro et al., 2013**).

Reconstruction of the lower extremity remains particularly challenging. Furthermore, the availability of adequate soft tissue for coverage is limited, particularly in the lower third of the leg. (**Scott et al., 2013**)

When reconstruction is necessary, several issues must be addressed, such as the size of the defect and the patient's vascular, neurosensory, and weight bearing status. For small defects, skin grafts are often the procedure of choice provided that there is adequate protective soft tissue within the bed of the defect. For small defects involving weight-bearing areas, axial innervated skin flaps and fasciocutaneous flaps have been successful in providing stable coverage. For the deeper, more extensive foot defect, the use of a muscle or musculocutaneous flap is usually necessary. (**Scott et al., 2013**)

Aim of the work

The aim of this work is to review the recent trends in the surgical management of chronic leg & foot ulcers, mainly to review lower extremity reconstruction. The goal of lower extremity reconstruction is the coverage of defects and open wounds of the leg & foot.

ANATOMY

Anatomy of Leg

The leg has several characteristics that make it unique. Humans are bipedal, thus full weight bearing in the erect position is on the two lower extremities. The full force of the weight of the body is transmitted through the legs. The muscles of the leg provide ankle function with plantar flexion, dorsiflexion, eversion, and inversion. Additional leg muscle functions include toe flexion, knee extension, and knee flexion. **(Kasabian & Karp, 2014)**

If the ankle were fused, the functional needs of the leg muscles are greatly unnecessary. Therefore, significant muscle loss of the leg can be tolerated with maintenance of bipedal ambulation. Consequently, muscle loss of the leg is not a contraindication to reconstruction and salvage. **(Kasabian & Karp, 2014)**

The hydrostatic pressures imposed on the leg increase the incidence of edema, deep venous thrombosis, and venous stasis problems. These problems are rare in the upper extremity, but common in the lower extremity. The lower extremity is also much more commonly afflicted with atherosclerosis than the upper extremity. Therefore, both venous and