Recent modalities in treatment of Chronic leg and foot ulcers

Essay

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By

Khalid Gamal Abd-Elshafy

M.B.,B.Ch.

Supervised by

Prof. Dr. Rafik Ramsis Morcos

Professor of General surgery
Faculty of Medicine-Ain Shams University

DR. Mohamed El-Sayed El-Shinawi

Lecturer of General surgery
Faculty of Medicine-Ain Shams University

Faculty of Medicine
Aim Shams University
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الطرق الحديثة لعلاج القرح المزمنة للقدم و الساق

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تحت إشراف

أ.د. رفيق رمسيس مرقص

أستاذ الجراحة العامة

كلية الطب – جامعة عين شمس

د. محمد السيد الشناوى

مدرس الجراحة العامة

كلية الطب – جامعة عين شمس

كلية الطب – جامعة عين شمس

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List of Abbreviations

MTP	Metatarsophalangeal joint
1CPT	Carboxyterminal telopeptide of type 1 collagen
ABI	Ankle-brachial index
AKA	Above knee amputation
BKA	Below knee amputation
CT	Computed tomography scans
DTH	Delayed-type hypersensitivity
FDA	Food and Drug Administration
HBO	Hyperbaric oxygen therapy
IDSA	Infectious Disease Society of America
IL	Interleukin
i-p	interphalangeal joint
LOPS	Loss of protective sensation
MESS	Mangled Extremity Severity Score
m-p	Metacarpal-phalangeal joint
MRA	Magnetic resonance angiogram
MRI	Magnetic resonance imaging
MRSA	methicillin-resistent S aureus
MSSA	methicillin-sensitive S aureus

NPWT	Negative pressure wound therapy
P1CP	procollagen carboxyterminal propeptide
PAD	Peripheral arterial disease
Pc	oxygen tension
PDGF	Platelet derived growth factor
PEDIS	Perfusion, Extent, Depth, Infection, and Sensation
PET	Positive emission tomography scanning
PMNLs	Polymorphonuclear leukocytes
STSGs	Split thickness skin grafts
Tc	Technetium bone scans
TGF-β	Transforming growth factor-beta
TNF-α	Tumour necrosis factor-alpha
US	Ultrasound scan
V.A.C	vacuum-assisted closure device
WBC	The white blood cell count

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Introduction

Ulcers are break in the layers of the skin that fail to heal. They may be accompanied by inflammation. Sometimes they don't heal and become chronic ***(Webb, 2001).***

The prevalence of active foot ulceration varies from approximately 1% in certain European and North American studies to more than 11% in reports from some African countries ***(Andrew and Boultan, 1999)***. Worldwide, every 30 seconds a lower limb is lost as a consequence of diabetes ***(Bakker et al., 2006).***

The most common cause of chronic leg ulcers is poor blood circulation in the legs. These are known as arterial and venous leg ulcers ***(Park et al., 2003).***

Other causes include: injury (traumatic ulcers),diabetes because of poor blood circulation or loss of sensation (nerve damage) resulting in pressure ulcers ,certain skin conditions, vascular diseases (stroke, angina, heart attack),tumors and infections ***(Flemming et al., 2004).***

Many varieties have been developed for the management of foot ulcers, starting from the basic wound management principles such as the care of diabetic foot ulcers in the form of strict bed rest and elevation of the lower extremity which are essential to eliminate edema and help control infection, adequate surgical debridment of necrotic tissues and drainage of purulent cavities are mandatory ***(Cianci, 1992).***

Treatment depends on the factors that cause the ulcer or have prevented healing. Some therapies for chronic leg ulcers, such as surgical debridement and split-thickness skin grafting, have been used for many years and still have a role in management. However, several new methods are also available. Among these hyperbaric oxygen, ozone, vacuum therapy, topical recombinant human platelet

derived growth factor, and human skin equivalent for use in grafting, all of which aid in healing and wound closure ***(Fleck, 2002).***

As regard the surgical plan, it should provide stable wound closure using the simplest techniques available for each part of the foot and leg. Among the surgical approaches which have been used for coverage is skin grafting techniques such as split thickness skin grafts ***(Grabb & Smith, 2005).***

Aim Of The Work

The aim of this work is to show recent management of different types of chronic leg & foot ulcers and highlights the advantages & disadvantages of various modalities of treatment.

Anatomy of the leg

Anatomy of the gaiter area:

The area just above the ankle is always the most tapered portion of the leg owing to the fact that it is almost entirely formed of tendons wrapped beneath the deep fascia, therefore exerting less specific influence on the leg contour.

More than 90% of venous ulcers are found in the gaiter area especially the medial aspect ***(Baker et al., 1991).***

The gaiter area is roughly represented by the lower third of the leg.

Callam and his colleagues (1987) define the gaiter area as a zone extending from 2.5cm below the malleoli to the point where the calf muscles become prominent posteriorly.

The orientation of the anatomical features of the gaiter area gives an idea about sites of predilection, pathogenesis and pathological features of venous ulcer, it also exerts an influence on the different lines of management in particular surgical reconstruction.

Blood Supply of the Gaiter Area:

Each Territory of skin consists of a unit of the integument supplied by arterial pedicles ***(Callam et al., 1987).***

Cutaneous vascular Territories are divided into:

A. Anatomical : The anatomical territories of a vessel is one based on observation of structure and delineated by the extent to which

the branches of that vessel ramify before anastomosing with adjacent vessels.

B. Dynamic: The dynamic territories depend on the concept of the equilibrium point. If one of a pair of abutting cutaneous vessels, was occluded then the other vessel would extend its territory into the area of decreased pressure.

C. Potential: The potential territory depends on the delay phenomenon. As used in Pedicled flaps raised on stages separated by period of about two weeks, The exact nature of these changes is unknown ***(Baker et al., 1991).***

The arterioles supplying the skin lie in the subcutaneous tissues and give off branches which form a network in the deep part of the dermis. This network gives off branches, which supply the subcutaneous tissue, sweat glands and deeper portion of the hair follicles. From the other side of this network vessels enter the dermis and form the denser subpapillary network at the junction of the papillary and reticular layers of the dermis. This gives off small branches which form loops in dermal papillae "papillary" loops. These loops are perpendicular to the surface of the skin.

The veins which collect the blood from the papillary loops from the first network of very thin vein immediately beneath the papillae, then follow a number of flat networks of gradually enlarging veins at the junction between the Reticular dermis and the subcutaneous tissue***(Baker et al., 1991).***