MANAGEMENT OF OPEN FRACTURES OF THE LOWER EXTREMITY. HOW VACUUM SEALING TECHNIQUE AND EXTERNAL FIXATION AFFECT THE OUTCOME.

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CERTIFICATION

The undersigned certify that he has read and hereby recommend for acceptance by the University of Dar es salaam a dissertation entitled:
Management of open fractures of the lower extremity. How vacuum sealing technique and external fixation affect the outcome, in partial fulfilment of the requirements for the degree of Master of Science Orthopaedic and Traumatology.

Dr. L. M. Museru
(SUPERVISOR)

Date: Dec 13th '97

DECLARATION AND COPYRIGHT

I declare that this dissertation is my own work and it has not been submitted in any other university or academic institution for a similar or any other award

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DEDICATION

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ABSTRACT

TITLE: Management of open fractures of the lower extremity. How vacuum sealing technique and external fixation system affect the outcome.

SUBJECT: Patients with fractures of the lower extremity in whom thorough wound debridement, copious irrigation, vacuum sealing application and external fixation was the main stay of treatment.

OBJECTIVE: To study and analyse the quality of various operative management of soft tissues and skeletal injuries of the lower extremity.

SUMMARY:

Amputation has been the main stay of treating open fractures up to the middle of the 19th century. This had resulted in considerable disability and great missery,especially in developing countries in terms of poor rehabilitation, and problems of prosthesis procurement. High infection rate, prolonged healing times and hospital stay, have greately hindered a normal life in victims with severe open fractures. Technology development in the western community today, has tremendously revolutionised open fracture treatment not only from amputation to limb salvage but also development of methods which prevent or lower infection rate, achieve short healing time short, duration of hospital stay, as well as short occupational re-intergration time.

Among 116 patients studied at the Traumatology department of the University of Ulm Germany, about 90% were treated by serial vacuum sealing after standard and serial debridement with thorough irrigation. Prophylactic antibiotic (cefuroxime) was administered to all patients and external fixation

was performed in 30% of patients, of which 16% were the Ilizarov ring fixation. Under the above protocol, the overral amputation rate was as low as 6%. It is concluded that the above protocol of open fracture treatment is associated with a high rate of limb salvage, low complication rate, short healing time and short duration of hospital stay. That undeniable fact outweighs the relatively expensive procurement of such surgical material necesary to establish this important protocol at the Muhimbili Orthopedic Institute.

CONTENTS

1. INTRODUCTION

1.1 DEFINITION

An open fracture is one in which there is a break in the skin and underlying soft tissue and this leads directly into or communicates with the fracture and its hematoma[35, 43]. "Compound fracture" is a non specific term and it is now rarely used[43]. Sometimes the diagnosis of an open fracture can pose a problem because the wound may be a considerable distance from the fracture site[38,47]. However when a wound occurs in the same limb segment as a fracture, the fracture should be considered open until proved otherwise[46]. The prognosis in open fractures is determined primarily by the amount of devitalised soft tissue and by the level and type of bacterial contamination[10, 33, 46]. These two factors are the primary determinants of the outcome.

1.2 HISTORICAL PERSPECTIVE

Over the issuing centuries an open fracture meant not only amputation but also death from sepsis [10,43,55,140,229]. The surgery of open fractures remained until the middle of nineteenth century, as the surgery of amputation[54].Amputation itself carried a very high mortality rate usually from haemorrhage and sepsis. In 1842, Malgaine[147] found that the overall mortality rate for amputation was 30%, whereas for major amputation was 52%, and for the thigh alone 60%. In the Franco-Germany war of 1870 to 1871 the mortality rate for all open fractures was 41%[43]. In the American civil war of