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CRUSH INJURY LEG: LIMB SALVAGE

Orthopaedics

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ABSTRACT

The threat of lower limb loss is seen commonly in severe crush injury, cancer ablation, diabetes, peripheral vascular disease and neuropathy. The primary goal of limb salvage is to restore and maintain stability and ambulation. Reconstructive strategies differ in each condition such as: Meticulous debridement and skeletal stabilization early coverage in trauma, , improving vascularity in ischaemic leg. e a borderline Mangled Extremity Severity Score in some cases reconstruction can be attempted considering the overall health status of the patient and local clinical status, with preserved plantar sensitivity and satisfactory capillary perfusion .In conclusion, management of mangled extremity treatment should refer to evidence- based literature in correlation with clinical evaluation of every individual patient. Scores are helpful but should not be taken as a sole Indication for amputation. Mangled extremity is a consequence of high Energy trauma which result in combined bone and soft tissue injury associated with severe bone and soft tissue loss or destruction (1).Treatment of a mangled lower extremity represents a major challenge decision whether to amputate or attempt reconstruction is currently based upon surgical evaluation (1).

KEYWORDS

Limb salvage, debridement,open fracture, external fixation.

INTRODUCTION

Severe open injuries of limbs, especially of the tibia when associated with vascular injuries, present major challenges in management. The decision to amputate or salvage can often be a difficult one even for experienced surgeons.{1,2,3}.In the 1960s, the presence of a severe crush injury or a vascular injury was sufficient to warrant an amputation. However, the evolution of sophisticated microsurgical reconstruction techniques along with the development of modern skeletal fixation and reconstruction devices in the 1980s made limb salvage technically possible even in the most extreme cases. {4}.

METHODS AND RESULTS

We treated 59 cases of high-energy trauma of lower limbs (Gustilo, grade III), with extensive damage of soft and deep tissues, from 2010 to 2018. All of them were ischemic limbs with high risk of amputation.7 patients underwent amputation as the first choice, and 57 underwent reconstruction. Fig 1.2.3.

To evaluate the results we analyzed: length of hospital stay, total rehabilitation time, cost, clinical outcomes, failure rate for limb salvage, factors associated with poor outcome, function and quality of life, return to work, and patientchoices.8

revascularizated patients were amputate during the initial hospitalization because of failing reconstruction. The remaining 44 patients had limb salvage. In 45 patients, were used NPWT at first, and autologous blood products and Moist Wound Therapy followed by debridement and external fixation and wound coverage. Length of hospital stay is similar in all patients operated for limb salvage, followed or not by amputation. Higher rehabilitation time was 12 months.

Despite a borderline Mangled Extremity Severity Score in some cases reconstruction can be attempted considering the overall health status of the patient and local clinical status, with preserved plantar sensitivity and satisfactory capillary perfusion. In conclusion, management of mangled extremity treatment should refer to evidence-based literature in correlation with clinical evaluation of every individual patient. Scores are helpful but should not be taken as a sole indication for amputation. Mangled extremity is a consequence of high energy trauma which result in combined bone and soft tissue injury associated with severe bone and soft tissue loss or destruction (1).Treatment of a mangled lower extremity represents a major challenge decision whether to amputate or attempt reconstruction is currently based upon surgical evaluation (1,2,3,4,5).

DISCUSSION

Decision making in a clinical situation of mangled extremity is complex (6). Due to the development of surgical techniques and technologies comprehensive reconstructions are possible today in limb salvage procedures(7–12).

Although in many cases based solely on clinical examination the decision to amputate or attempt salvage is clear, in borderline cases the decision requires the utilization of different tools, such as scoring systems, that may help differentiate salvageable from non-salvageable extremities (1).There is a variety of different scoring systems designed to aid clinical decision-making, such as the MESS, the Limb Salvage Index (LSI), the Predictive Salvage Index (PSI), the Nerve Injury, Ischemia, Soft-Tissue Injury, Skeletal Injury, Shock, and Age (NISSSA)Score, the Hannover Fracture Scale-97 (HFS-97) and many others (4,13–17). The purpose of these scores is to allow accurate prediction of either the Need for amputation or the possibility of salvage. Ideally, a trauma limb-salvage score should have a perfect accuracy with a sensitivity of 100% (all amputated limbs with trauma limb-salvage scores at or above the threshold) and specificity of 100% (all salvaged limbs with scores below the threshold). Several clinical trials were conducted in order to determine the exact cut point for these scores that could be used in decision making (1). Johansen et al. reported that a MESS score greater or equal to 7 predicted amputation with 100% accuracy (4). Since delayed amputation in that study resulted in over 20% mortality from sepsis as compared to no mortality in primary amputation (4),the importance of accurate decision making is obviously of paramount importance. MESS, NISSSA, andHFS-97 scores are greatly influenced by the results of initial neurological examination, with the assumption that an acute sensory debilitation correlates with decreased limb-salvage potential and that the initial examination demonstrates the final deficiency (1).{6,7,8,9,10}.

Early soft tissue coverage of a mangled foot and ankle with Vacuum Asisted Closure (VAC) combined with silver dressings is very convenient And results in fewer complications, earlier mobilization and return to work. However, early aggressive fracture fixation and definitive soft-tissue Reconstruction may be favorable for isolated extremity fractures but may not be the safest option for the majority of patients with complex extremity fractures, many of whom have severe additional injuries.

necrotizing fasciitis is a special problem which represents a rapidly progressive infection with necrosis of the fascia and surrounding tissues and has a mortality rate up to 76%. Important clinical findings are pain, hyperpyrexia, chills, cellulitis, edema,warmth, induration, crepitus, skin necrosis and bullae .

Immediate aggressive surgical debridement (skin, subcutaneous tissue, muscle debridement,fasciotomy) and administration of high doses of antibiotics are the main steps of treatment.{10,11,12,13,14}.

In the end, functional demands and expectations of the patients, in combination with the estimated time required for the reconstructive procedures, are also critical parameters for the final decision. Primary amputation should not be considered as a treatment failure, but rather as a means of meeting the goal of treatment .{15,16,17}.

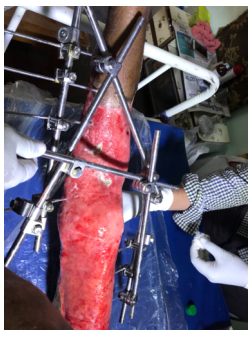
CONCLUSION

When treating mangled extremity, it is necessary to include all other patient and wound variables (1) in addition to scoring systems in order to allow improved treatment outcomes using an individualized approach to patients with mangled extremities. Consequently, there is an obvious need for comprehensive criteria proposal of mangled extremity treatment for borderline cases (1) that will take into account not only scoring systems, but also important patient and wound characteristics .

FIGURE 1

FIGURE 2

FIGURE 3



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