Amputees have Better Quality of Life than who had Limb Salvaged in Grade Iii B and Grade Iii C Crush Injury

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ABSTRACT

Background: *Trauma to the extremities represents one of the most common injury patterns seen in emergency medical and surgical practice. As extremity injuries are evaluated, each of four functional components (nerves, vessels, bones, and soft tissues) must be considered individually and together. If three of these four elements are injured, the patient has a "mangled extremity". In this article we are going to assess the quality of life of patients who had crush injury to the leg.*

Methods: *Both retrospective and prospective study of 60 patients who had Grade III b and Grade IIIc open fractures of the lower limb. Study was done in Sri Ramachandra Medical College between Jan 2012 and Jan 2015. Patients who had crush injury to their lower limbs with Mangled Extremity Severity Score of seven and above were included. We followed Gustillo and Anderson classification system for fractures classification. Mangled Extremity Severity Score for all the patients were calculated. SF12 quality of life questionnaire was used to assess the patients during follow-ups.*

Results: *The Mean PCS (physical component summary) score in SF 12 quality of life questionnaire for Amputation group and Limb Salvage group were 39.05 and 29.91. The Mean MCS (mental composite summary) score for Amputation group and Limb Salvage group were 43.10 and 36.05.*

Conclusion: *The quality of life of patients who underwent amputations was statistically significant when compared to patients who had their limb salvaged.*

Keywords: *Amputation, Limb salvaged, Crush injury, Mangled extremity, Open fracture*

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INTRODUCTION

Trauma to the extremities represents one of the most common injury patterns seen in emergency medical and surgical practice. As extremity injuries are evaluated, each of four functional components (nerves, vessels, bones, and soft tissues) must be considered individually and together. If three of these four elements are injured, the patient has a "mangled extremity"[1]. Achieving the best outcome in patients with severe extremity injuries requires a multidisciplinary approach with oversight by the general or trauma surgeon and commitment from other specialists including orthopedic, vascular, and plastic surgeons, as well as rehabilitation specialists. In most instances, limb salvage can be attempted even if the patient has a mangled extremity. However, at times, the injury to the extremity is so severe that primary amputation at the initial operation is required. In this article we are going to evaluate whether amputees have better quality of life than who had limb salvaged in grade III b and grade III c crush injury.

MATERIALS AND METHODS

Both retrospective and prospective study of 60 patients who had Grade III b and Grade IIIc open fractures of the lower extremity limb. Study was done in Sri Ramachandra Medical collage between Jan 2012 and Jan 2015. Patients who had crush injury to their lower limbs with Mangled Extremity Severity Score of seven and above were included. Patients were followed up for a minimum period of one year. Patients who had associated crush injury of foot and any other long bone injury were excluded from the study. We followed Gustillo and Anderson classification system[2,3] for fractures classification. Mangled Extremity Severity Score[4,5] for all the patients were calculated. Thirty-two patients had primary amputations while 28 of them had their limbs salvaged. Patients age varies from 20 to 65 yrs. Mode of injury in 56 patients were road traffic accidents while two had train and motorboat accident. SF12 quality of life questionnaire was used to assess the patients during follow-ups.

RESULTS

Patients in limb salvage group had a mean MESS score of 7.8 while amputated group had 9.5. Primary guillotine amputation was done in all patients in the amputation group. Patients in salvage group underwent primary wound debridement and external fixator in day one. Subsequent procedures like secondary wound debridement, split skin graft,

flap cover were done depending upon the wound condition. The mean SF score for Physical component summary was 39.05 and mental component summary was 43.10. Parameters comparing amputated and limb salvage group were tabulated as per Table 1. In limb salvage group the mean SF score for physical component summary was 29.91 and mental component summary was 36.80. In limb salvage group 16 patients had nonunion, 2 had osteomyelitis, 10 had equinus deformity of foot, hypothesia of foot in 12 while hyperthesia of foot in 6 patients and all patients had either knee/ankle stiffness. In amputated group 2 had wound dehiscence, 2 had stump neuroma and 2 phantom limb sensation and infection.

DISCUSSIONS

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[6,7,8]. Surgeons began undertaking prolonged attempts at reconstruction, and patients who sustained severe Grade III B and C open tibia fractures were subjected to two to three years of hospitalization; multiple surgeries, sometimes up to 20 surgeries including debridement, fixation attempts, soft tissue cover procedures, and bone grafts, were performed[8]. Despite such heroic but not very wise efforts, failures were common because of infection, nonunion, soft tissue cover failures, and delayed secondary amputation[9,10,11]. In the process, many patients lost their jobs, families, savings, and most importantly, their self-image and self-respect. As a result of secondary amputation, not just the limb is lost, but the patients and their families are frequently devastated and destroyed physically, psychologically, socially, and financially. It became obvious that technical advances

Can be double-edged swords, and prolonged attempts at salvage may actually be a triumph of technique over reason[12]. In attempting salvage, the question therefore is not whether you can but whether you should or not. There is good evidence that patients with primary amputation and who have been rehabilitated well not only perform better but are also saved of the agony of multiple surgical procedures and severe financial strain[12-17].

An attempt to quantify the severity of the trauma and to establish numerical guidelines for the decision to amputate or salvage the limb has been proposed by many authors. These include the MESS, the PSI, the LSI, the nerve injury, ischemia, soft tissue injury, skeletal injury and age of the patient (NISSA) score and the Hanover fracture scale-97[18]. Modern techniques have made limb salvage possible but many have expressed skepticism regarding the long-term disability associated with limb salvage. Several authors have reported a quicker time to recovery and reduced long-term disability with amputation[19] although others disagree[20]. Dougherty[21] described the functional outcome of transtibial amputees from the Vietnam War. All had been treated in the same specialist centre with intensive multidisciplinary involvement at every stage from amputation to prosthetic training. However, their patients were very different from ours in that they were young highly trained military personnel. Their mean length of follow-up was 28 years, giving more time to adapt to life with the prosthesis. Amputation due to injury is relatively rare and is the cause of only 10–20% of lower-limb loss in the developed world[22]. Approximately 55% of civilian lower limb amputations for trauma are below knee amputation, 40% above knee amputation, less than 5% knee disarticulation and 1% bilateral amputations.[23,24]

Almost all of the limb-salvaged patients had pain and swelling of their legs, needing ambulatory aids for mobilization. None of the patients had gone back to her pre injury occupation status. Patients in the limb salvage group have had significantly less than satisfactory functional outcome compared to patients who have had primary amputation. The studies of Georgiadis et al[25] and Bondurant et al[26] had similar results like our study. Delay in choosing option of amputation was associated with significant increase in number of surgical procedures, duration of hospital stay, rate of sepsis and non-union and overall disability. The patients whom had primary amputation had better functional outcome in terms of being able to do their activities of daily living and getting back to pre-injury occupation, compared to patients who had their limb salvage[27]. From the Table 2 it is evident that in amputation group the mean PCS and MCS scores were higher in comparison to the Limb salvage group. The quality of life of patients who underwent amputations was better when compared to patients who had their limb salvaged.

Table 1: Different parameters between amputated and limb salvage group

S. No	Parameter	Amputated Group	Limb Salvage Group
1	Infection	0	90%
2	Hospitalisation	20 days	142 days
3	Number of Surgeries	3	7
4	Weight Bearing	Full	Partial
5	Pre injury occupation status	80%	18%

Table 2: Mean Physical and Mental component summary

Group		Mean
PCS	Amputation Group	39.05
	Limb Salvage Group	29.91
MCS	Amputation Group	43.10
	Limb Salvage Group	36.05

CONCLUSION

Amputation, although never the primary goal of the physician, may well be the procedure of choice in some cases. By proceeding with primary or early secondary amputation, it is often possible to quickly return a healthy productive individual back to society rather than have the patient suffer from a chronic nonfunctional state. From the above observation it is evident that quality of life of amputees are better than those who had their limb salvaged.

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