

Research Article

Amputation Or Reconstruction: Assesment of Long-term Outcome And Patient's Satisfaction In Severe Lower Limb Trauma

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Abstract

Back ground: Complex and severe lower limb injuries pose a difficult situation for reconstructive surgeons. there is no consensus on the standard criteria to decide about amputation or limb salvage,

Objectives: Objective of the study was to compare the patient satisfaction in those undergoing amputation versus reconstruction in severe lower limb trauma.

Methodology: Record of patients presenting to the accident and emergency department of Liaquat National Hospital, with limb threatening lower limb injuries during July 2016 to July 2018 were included. Patients were categorized in two groups; A) Patients who underwent primary amputation B) Patient who underwent salvage surgery. We reviewed the patients at least one year after the last procedure and assessment Performa (evaluating gait, skin and joint conditions and sensation) and patients' satisfaction questionnaire were filled.

Results: Out of 50 patients that were included, 28 patients underwent primary amputation while 22 patients had limb salvage procedure. There was no significant difference in patients' satisfaction in terms of pain, function, social activities and quality of life who under -went undergoing amputation or limb salvage.

Conclusion: A well planned and thoroughly judged primary amputation is a sensible option in certain cases with severe lower limb trauma(MESS score > 7) keeping in mind long-term patient's morbidity and satisfaction.

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Introduction

Complex and severe trauma to lower limbs poses a difficult situation for reconstructive surgeons in management of such injuries. In such limb threatening injuries, no standard criteria regarding amputation or salvage has been described in literature.¹⁻⁴ With recent advances in orthoplastics, more options of limb salvage have become available to surgeons.⁵ However, when opting for limb salvage, need for multiple reconstructive surgeries, longer duration of hospital stay and longer time to return to occupational activities and additional costs must be taken into consideration.

Despite best of efforts by the reconstructive team, the

outcome of limb salvage remains variable, if not disappointing and has been found to be associated with higher complication rates such as infection, fracture, malunion or nonunion etc and necessitating need of delayed amputation.

Primary amputation has the advantage of single surgery, limited hospital stays, cost effective, decreased patient morbidity, early rehabilitation and, with proper prosthesis, early return to work but all at the cost of loss of limb. Patient fully understanding the need of amputating limb rather should be of utmost importance as the burden of decision lies on both the surgeon and the patient.

The objective of our study is to observe the functional outcomes and short/ long term complications in patients

undergoing either amputation or limb salvage surgery after severe lower limb trauma and to compare the patient satisfaction in both groups and to compare their overall quality of life and return to work. MESS scoring system⁶

Mangled Extremity Severity Score (MESS)			
Type	Characteristics	Injury	Points
1	Low energy	stab wound, simple closed fx, small-caliber GSW	1
2	Medium energy	Open/multilevel fx, dislocation, moderate crush	2
3	High energy	shotgun, high-velocity GSW	3
4	Massive crush	Logging, railroad, oil rig accidents	4
Shock Group			
1	Normotensive	BP stable	0
2	Transiently hypotensive	BP unstable in field but responsive to fluid	1
3	Prolonged hypotension	SBP <90mmHg in field and responsive to IV fluids in OR	2
Ischemia Group			
1	None	Pulsatile, no signs of ischemia	1
2	Mild	Diminished pulses without signs of ischemia	2
3	Moderate	No dopplerable pulse, sluggish cap refill, paresthesia, diminished motor activity	3
4	Advanced	Pulseless, cool, paralyzed, numb without cap refill	4
Age Group			
1	<30y/o		0
2	>30 <50		1

MESS score: six or less consistent with a salvageable limb. Seven or greater amputation generally the eventual result.

From Helfet DL, Clin Orthop 1990 256:80

has been used to evaluate the severity of injury (figure 1)

Figure 1: Mangled Extremity Severity Score (MESS)

Methods

It was retrospective cohort study conducted on patients presented to the accident and emergency department of Liaquat national hospital and medical Centre, with limb threatening lower limb injuries during July 2016 to June 2018. MESS scoring system was used to evaluate the severity of injury and patients with a MESS core >5 were included in the study. Patients who were unstable for reconstruction, Poly trauma patients with other life-threatening injuries and patients having previous uncontrolled co-morbidities were excluded from study.

All the patients presented with lower limb trauma, meeting the inclusion criteria were included in the study. Patients were categorized in two groups; A) Patients who underwent amputation, B) Patient who opted for limb salvage surgery that is salvage group.

We reviewed the patients at least one year after the last procedure and assessment Performa (evaluating gait, skin and joint conditions and sensation) were filled. Patients were asked to rate their satisfaction with their respective surgical procedure on a scale of 1 to 10. We used SPSS version 22 for data analysis. Quantitative variables like age and satisfaction score were presented as mean (Sd).

Results

Forty patients fulfilled the inclusion criteria. Mean age was 30.2 ± 7.2 years (Range 16 to 54 years). Average MESS score was 7.1 with minimum score of 5 and maximum of 10. Mechanism of injury is summarized in table 1. Thirty-two patients had fractures of both tibia and fibula fracture and 2 fracture of tibia alone. There were two patients with fracture of calcaneum and 4 had fractures of metatarsals. Twenty-eight patients out of 40 patients underwent direct amputation as their primary surgical procedure. We salvaged limbs of 12 patients by multiple surgical procedures. However, eight patients in which limb was salvaged, underwent delayed amputation. Reconstruction done by multiple procedures in salvage group is shown in table 2. In amputation group 16 patients had above knee amputation while in 12 patients below knee amputation was done. Complications face by salvaged group included wound infection in 4 patients, partial graft loss in 2 patients while 4 patients suffered with chronic ulcers in salvaged limb. Average satisfaction score with procedure in salvage group was 4.9 while it was 5.8 in amputation showing more contentment in amputation group. The patients who could walk on their salvaged or prosthetic limbs were more satisfied (average score 5.7) as compared to those who were not able to bear weight (average score 3.0). Similarly, patients who returned to their previous work are more satisfied with average score of 6.2 compared to score of 3,6 in those patients who are not able to continue their previous work.

Table 1: Mechanism of Injury in Patients

Mechanism of injury	Number of patients
Road traffic accident	20
Bomb blast injuries	12
Machine crush injury	4
Gun shot	4

Table 2: Reconstructive Options Utilized

Reconstructive option	No. of patients
Primary closure of wound	2
Skin grafting	4
Skin grafting + local flaps	2
Free flaps	4

Discussion

The decision to either salvage a traumatic limb or undergo amputation remains a tough one and the burden lies on both the surgeon and the patient with no current evidence to suggest either strategy being superior to the other⁷.

In our center, a combined orthopedics and plastic surgery teams' approach is adopted when patients with such complex lower limb injuries present in the emergency department. After proper counseling of merits and demerits of both salvage and primary amputation and need of delayed amputation if salvage surgery fails, patient and his attendants are asked to take decision regarding the management plan.

In our study, we reviewed patients in both the groups in terms of satisfaction with the treatment plan, cost of treatment, hospital stay, return to work and overall quality of life and found that patient who underwent primary amputation reported better outcomes and overall satisfaction rates as compared to limb salvage group. Douglas et al³ reported similar outcomes in patients with major lower extremity trauma.

When reviewing number of patients when returned to work after treatment, it was found that 56% of patients with primary amputation resumed their previous work as compared to 35% of patients in limb salvage group. Average duration of patients returning to work after intervention was also reported to be more in salvage group as compared to the amputation group.

Hoogendoorn et al⁸ reported higher incidence of complications in limb salvage group. This is consistent with our study. The incidence of complications in limb salvage group were higher and included recurrent ulcers, infections, need of multiple hospital visits with multiple surgeries and delayed return to normal activities. Eight patients even ended up in secondary amputation after failure of treatment.

In contrast, patients who had primary amputation, be it above or below knee, had earlier return to job activities once prosthesis were applied as soon as the wound healed. With the advances in lower limb prosthesis, rehabilitation of amputees has become easier. Patients are able to perform their daily activities and return to work is earlier.

Conclusion

In conclusion, a well-planned and thoroughly judged primary amputation in selected patients is a sensible option in severe lower limb trauma as it results in early return to work and more patient satisfaction as compared to limb salvage surgery.

Conflict of Interest *None*

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