Original Research Article

A study of loss of DALY seen in the patients of open tibia fracture treated with External versus Internal fixation

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Abstract

Background: Compound fracture of the tibia is one of the most common injuries encountered by any orthopaedics center. **Aims and Objectives:** To study loss of DALY seen in the patients of open tibia fracture treated with External versus Internal fixation. **Material and Methods:** Between June 2012 to November 2013, 30 patients with open tibia fracture treated with external fixation and 30 treated with internal fixation were included in the study. The ethics committee approved the study plan informed consent was obtained from all patients before the operation. patient with age>15 years, patient presenting with grade II, IIIa and IIIb open tibia fracture decided to be treated with fixation were included into study while Patient having associated vascular injury , Fracture involving epiphysis, Patients not willing for surgery , Closed fractures were excluded from the study. Once a patient with open tibia fracture is admitted the standards treatment protocol was followed. Statistical analysis done by unpaired t test. **Result:** The mean DALY Lost for wound healing for External fixation was 3.26 Months while for Internal fixation was 1.06 months (P<0.05), The mean DALY Lost for clinical union for External fixation was 7.92 months while for Internal fixation was 4.57 months(P<0.05)The mean DALY Lost for Radiological union for External fixation was 8.39 months while for Internal fixation was 4.89 months (P<0.05). **Conclusion:** It can be concluded from our study that Internal fixation was superior to External fixation in comparison with DALY Lost as significantly higher DALY lost was in External fixation as compared to internal Fixation.

Keywords: DALY Lost, Internal fixation (ORIF), Externalfixation (MIPO).

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INTRODUCTION

Compound fracture of the tibia is one of the most common injuries encountered by any orthopedics center. There was a great evolution in the management of compound fracture of any bone from plaster of Paris (POP) with window, continuous traction, pin and plaster, external fixation, ring fixation, and hybrid fixation to primary locked intramedullary (IM) nailing. The main concern in compound fracture is soft tissue management.[1,2] Nowadays, with better understanding of soft tissue management, primary fixation of fracture site is advised without further insulting the already damaged soft tissue.[2,3,4] However, diaphyseal compound fractures of tibia are well managed by primary locked IM nailing[5,6,7,8,9] with soft tissue coverage procedure simultaneously depending on the soft tissue defect.[2,3,4] Metaphyseal proximal and distal compound fractures of the tibia are still the area of concern for most of the

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orthopedic surgeons. The known method of management of compound metaphyseal fracture is continuous skeletal traction, which leads to joint stiffness and high dependency of patient on others. Other methods are external fixation either tubular[10,11,12,13] ring fixators[14,15,16] or hybrid fixators,[17] external fixator followed by IM nailing in staged procedure,[18] and external fixator followed by minimally invasive percutaneous plate osteosynthesis (MIPPO) plating again in staged manner.[22]

MATERIAL AND METHODS

Between june 2009 to November 2010, 30 patients with open tibia fracture treated with external fixation and 30 treated with internal fixation were included In the study. The ethics committee approved the study plan informed consent was obtained from all patients before the operation.patient with age>15 years, patient presenting with grade II, IIIa and IIIb open tibia fracture decided to be treated with fixation were included into study while Patient having associated vascular injury, Fracture involving epiphysis**,** Patients not willing for surgery, Closed fractures were excluded from the study. Once a patient with open tibia fracture is admitted the standards treatment protocol was followed. Statistical analysis done by unpaired -t-test.

RESULT

Table 1: Wound healing (DALY Lost)

Wound healed at (in Months)	External fixation	Internal fixation
Mean	3.26	1.06
Variance	3.71	0.48
Observations	28	29
Pooled variance	2.07	
T stat	5.76	
P(T<=t) two-tail	3.91E-07	
t critical two-tail	2.004	

The mean DALY Lost for wound healing for External fixationwas3.26Months while for Internal fixation was 1.06 months. t-Test: Two-sample Assuming Equal variance, here p value is highly significant indicating wound healing IF occurs more quickly which is significant as compared to EF.

Table 2: Clinical union

Clinical union (in months)	External fixation	Internal fixation
Mean	7.92	4.57
Variance	7.42	2.3
Observations	14	23
Pooled variance	4.202307	
T stat	4.840116	
P (T<=t) two-tail	2.6E-05	
T critical two-tail	2.030108	

The mean DALY Lost for clinical union for External fixation was7.92 months while for Internal fixation was 4.57 months. t-test: two-sample assuming Equal variances, Here p value is significant indicating clinical union after internal fixation occurs in a shorter duration which is significant as compared to EF.

Table 3: Radiological union

Radiological union(months)	External fixation	Internal fixation
Mean	8.39	4.89
Variance	6.47	1.98
Observations	14	23
Pooled variance	3.65	
T stat	5.410678	
P (T<=t) two-tail	4.62E-06	
T critical two-tail	2.03	

The mean DALY Lost for Radiologicalunion for External fixation was 8.39months while for Internal fixation was 4.89months.t-Test: two-sample assuming Equal variances, Here p value is very significant indicating radiological union after internal fixation occurs in a shorter duration which is significant as compared to EF.

DISCUSSION

The optimal treatment of unstable distal tibia without articular involvement remains controversial, despite the variety of treatment options which have been suggested for these injuries, including nonoperative treatment, external fixation, intramedullary nailing, and plate fixation. However, each of these treatment options has certain defects. Nonoperative treatment may be complicated by loss of reduction and subsequent malunion; external fixation of distal tibia fractures may result in insufficient reduction, malunion, and pin tract infection; there is some concern about the use of IMN in distal tibia fractures; ORIF results in extensive soft tissue dissection and may be associated with wound complications and infections. In recent years, numerous reports have argued that the MIPO technique is a safe and worthwhile method of managing such fractures, whilst avoiding some of the complications associated with conventional open plating methods. However, some studies have also revealed defects of the MIPO technique. Hasenboehler *et al.*[18] reported that although MIPO seems more advantageous for soft tissue and bone biology, prolonged healing times were observed in simple fracture patterns. Khoury *et al.*[19] pointed out that for the MIPO technique, reduction should be performed cautiously due to the tendency of sagittal plane malreduction. Therefore, whether the virtues of the MIPO technique exceed ORIF is not clear. Tibial plafond fractures are severe injuries that have an extraordinarily high incidence of morbidity. Historically, these patients were treated with medial-based open reduction and internal fixation (ORIF) of the tibia with bone grafting as needed to accomplish the goal

of restoration of the distal fibula length and the articular surface.[20-23] According to reports in Europe, this treatment had excellent results and low complication rates.[23,24] The orthopedic literature reporting this treatment protocol for plafond fractures showed good results for Internal Fixation with low complication rates.[24] In our study we have found that The mean DALY Lost for wound healing for External fixation was 3.26 Months while for Internal fixation was 1.06 months (P<0.05), The mean DALY Lost for clinical union for External fixation was 7.92 months while for Internal fixation was 4.57 months (P<0.05) The mean DALY Lost for Radiological union for External fixation was 8.39 months while for Internal fixation was 4.89 months (P<0.05).

CONCLUSION

It can be concluded from our study that Internal fixation was superior to External fixation in comparison with DALY Lost as significantly higher DALY lost was in External fixation as compared to internal Fixation.

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