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The Outcome of the Compound Segmental Tibial Shaft Fracture Managed by the Limb Reconstruction System Fixator: A Case Report

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Abstract

PURPOSE: Limb reconstruction system (LRS) fixators have been used in the management of complex tibial fractures with severe soft tissue injuries, compound tibial fractures, and infected tibial non-union for which conventional internal fixation cannot be contemplated. Fracture union and distraction osteogenesis can be done simultaneously with these external fixators , allowing early weight bearing. Thus, a prospective observational study was done to evaluate the union rate, functional outcome and limb length discrepancy in compound segmental tibial fractures managed primarily by LRS fixators.

METHODOLOGY: A prospective observational study was conducted at Agartala Government Medical College & GBP Hospital, Tripura, India and included two patients with compound segmental tibial fracture. The patients underwent LRS fixation and followed up at 1 month, 3 months, 6 months and 1 year. Functional and radiological outcomes were assessed using the Association for the Study and Application of Methods of Ilizarov (ASAMI) criteria.

RESULTS: Union was achieved and radiological outcome was found excellent. Functional result was satisfactory. Post operative evaluation showed no pin-tract infection, loosening of pin, breakage of pin, assembly loosening, knee stiffness, ankle stiffness, neurovascular complication, limb length discrepancy, chronic osteomyelitis and delayed union. The patients achieved full range of motion at knee (0 to 135 degree), plantar flexion (0 to 45 degree) and dorsi flexion (0 to 20 degree). **CONCLUSION:** In this assessment, LRS fixators showed a favorable result in terms of fracture union and functional outcome with good healing of the soft tissues and maintenance of the limb length.

INTRODUCTION

Tibia being the most common fractured long bone represents 36.7% of all long bone fractures in adults with open fracture comprises 23.5% of all tibial shaft fracture. The lack of the muscular covering over anteromedial aspect of the tibia and poor blood supply predispose open tibial fractures to a 10–20 fold increased risk of developing infection than open fracture in any other anatomical areas and a nonunion rate as high as 28% has been reported in the literature. Limb reconstruction system (LRS) is a minimally invasive fixator, which permit effective wound management, early weight bearing and limb lengthening, working on the same principle of compression distraction histogenesis.

CASE PRESENTATION

A 23 years old male presented to AGMC & GBPH, Dept. of Orthopaedics OPD with complaints of pain and bleeding from right leg following history of alleged RTA. Xray revealed segmental fracture of tibia

and fracture of fibula. Clinical evaluation and primary wound debridement with copious amount of normal saline were done. Application of LRS was done and partial weight bearing was given with joint mobilizing exercise. After discharge, regular follow-up was done with regular xrays.

MATERIALS AND METHODOLOGY

A prospective observational study was conducted at Agartala Government Medical College & GBP Hospital, Tripura, India with compound segmental tibial fracture. The patients underwent LRS fixation and followed up at 1 month, 3 months, 6 months and 1 year. Application of rail and ring fixators was carried out in such a manner that it should be away from the site of wound to leave enough area for the soft tissue procedure/dressing. The fixator was placed in neutralization mode in compression mode to narrow the fracture gap and improve stability. Functional and radiological outcomes were assessed using the Association for the Study and Application of Methods of Ilizarov (ASAMI) criteria.

RESULT

Union was achieved and radiological outcome was found excellent. Functional result was satisfactory. Post operative evaluation showed no pin-tract infection, loosening of pin, breakage of pin, assembly loosening, knee stiffness, ankle stiffness, neurovascular complication, limb length discrepancy, chronic osteomyelitis and delayed union.The patients achieved full range of motion at knee (0 to 135 degree), plantar flexion (0 to 45 degree) and dorsi flexion (0 to 20 degree).

CONCLUSION:

In this assessment, LRS fixators showed a favorable result in terms of fracture union and functional outcome with good healing of the soft tissues and maintenance of the limb length.