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Functional outcome of precontoured locking compression plate fixation of tibial plateau fractures in adults

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Abstract

Tibial plateau fractures are one of the commonest intra articular fractures. These injuries encompass many varied fracture configuration that involve medial, lateral or both tibial plateau with varied degree of compression and articular displacements. Articular reconstruction and stable fixation of tibial plateau fractures and its various subtypes continue to represent a surgical challenge. Only few trials have studied results following angular stable plate fixation. In our prospective longitudinal study of 20 subjects with follow up of six months using Rasmussens knee scoring system found a statistically significant difference in the functional outcome with the use of angle stable locking compression plate.

Keywords: Tibial plateau fractures, Rasmussens knee score, Schatzker classification, precontoured angular stable locking plate, radiological union, malunion

Introduction

Presently the majority of tibial plateau fractures are secondary to high speed motor vehicle accidents and fall from height. The direction, magnitude and location of the force, as well as the position of the knee at impact, determines the fracture pattern, location, and degree of displacement. Fractures of tibial plateau occur as a result of strong valgus or varus forces combined with axial loading. Younger patients with good bone tend to have split fractures with less depression and elderly patients with osteopenic bone have a greater component of compression with a less prominent split fragment. Their management is challenging because of the severe displacement of the bony fragments, the concomitant depression and impaction of the cancellous sub-chondral bone, and the inevitable associated cartilage injury. Often there are associated complications, i.e. compartment syndrome, cartilage destruction, soft-tissue envelope damage, post-surgery infection, knee instability, stiffness, early or late post traumatic arthritis. The aim of surgical treatment is to restore both mechanical axis alignment and articular surface. In this study, we have used 3.5 mm pre-contoured locking compression plate (LCP) for fixation. Although many existing reports describe treatment results after tibial plateau fractures (mostly with conventional plating), very few studies have investigated results of tibial plateau fracture fixation using angle-stable implants. The drawbacks of more recent studies are small patient numbers and missing data for functional outcome or information about the used implant type.

Materials and Methods

Twenty adult patients with tibial plateau fractures operated using precontoured locking compression plates during the period of 2015-2016 at Southern Railway Headquarters Hospital, Chennai were recruited and followed up for a period of six months. The primary outcome was assessed by Rasmussen's knee Scoring system and the results were analysed with statistical tools.

Results

In our study the mean Rasmussen's knee scoring was 38.45 at the end of six months. Rasmussen's knee scoring was excellent in 06 patients, good in 13 patients and fair in 1

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patient. Average time taken for radiological union was 16 weeks. We found a statistically significant difference (p value 0.000) in Rasmussen's knee scores between the first month, third month and sixth months indicating improvement in functional status of the patient over a period of six months after surgery. There were no cases of implant removal due to malunion despite having had this complication in one of our case (05%).

Conclusions

Based on our study, we recommend the use of precontoured locking compression plates for tibial plateau fractures. These plates also avoid the need for intra operative contouring and potentially eliminate the necessity of a second surgery for implant removal. Sterile precautions, early surgery, perfect anatomical reduction and early postoperative rehabilitation are needed to achieve favourable results.

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