

## The Functional Outcome of Tibial Plateau Fractures (Schatker Type V & VI) with Locking Compression Plate

R. B. Uppin\*, Rajeshwar Singh Sidhu\*\*, Shivraj P. Patil\*\*\*

**Author Affiliation:** \* \*\* \*\*\*Department of Orthopaedics, KLE' University's J.N Medical college & Dr Prabhakar Kore Hospital and MRC, Belgaum.

**Reprint Request:** R. B. Uppin, Professor, Department of Orthopaedics, K L E Universitys J N Medical College, Belgaum, Karnataka India.  
E-mail: uppinrajendra@rediffmail.com

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### Abstract

High energy complex tibia plateau fracture due to intra-articular are usually associated with injury to ligaments, capsule and other soft tissues surrounding the joint. They present multifaceted problems of difficulty of achieving accurate joint reconstruction. It also contributes to other complications i.e. infection, fixed flexion deformity, knee stiffness. These complications make treatment of tibia plateau fractures a difficult task for an orthopaedic surgeon. This study was undertaken to evaluate and explore locking compression plate fixation in tibia plateau fractures, which is expected to provide a stable fixation with minimum exposure, early mobilization, less complications and a better quality of life.

**Keyword:** Tibialplateau; Intra-Articular Fracture; Locking Compression Plate.

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### Introduction

High energy complex tibial plateau fracture due to intra-articular are usually associated with injury to ligaments, capsule and other soft tissues around the joint. They present multifaceted difficulties in achieving accurate joint reconstruction. Various classification systems are available for classifying these fractures including Schatzker classification system and AO classification [1-3]. The Schatzker classification system for tibial plateau fractures, which divides these fractures into six types, is widely recognized by orthopaedic surgeons to assess the initial injury, plan management and predict prognosis.

Proximal tibial locking compression plate is based on biomechanical principle of external fixators and internal fixators since the angle-stable interface between the screws and the plate allows placement of the plate without any contact to the bone giving

the advantage of preserving the periosteal blood supply and bone perfusion. Thus significantly less soft tissue dissection may be required resulting in preservation of the local blood supply and enhancing the healing of the fracture [2]. The complications are more probable to result from high energy than from low energy fractures. The management of these fractures remain controversial because the rate of complications is high regardless of treatment. The reported complications include: wound breakdown, deep infection, deep vein thrombosis, compartment syndrome, non-union, myositis ossificans, peroneal palsies, hardware failure, and arthro-fibrosis. Moreover, extensive surgery on a severely comminuted fracture may result in less than optimal internal fixation and a need for postoperative immobilization, often resulting in the joint being neither stable nor freely movable. (6) In our study we hereby study the functional outcome of proximal tibial fractures treated with locking plates.

## Materials and Methods

This was a prospective study for evaluation of tibial plateau fractures managed with locking compression plates. The study included 20 cases of fracture of tibial plateau presenting to the emergency and OPD of KLE' University's J.N Medical college & Dr. Prabhakar Kore Hospital, Belgaum The results were compiled and analyzed using *sanders 40 point functional evaluation scale*.

The surgical approach to complex tibial plateau fractures was individualized on the basis of particular fracture configuration. Three standard approaches [9] were used including:

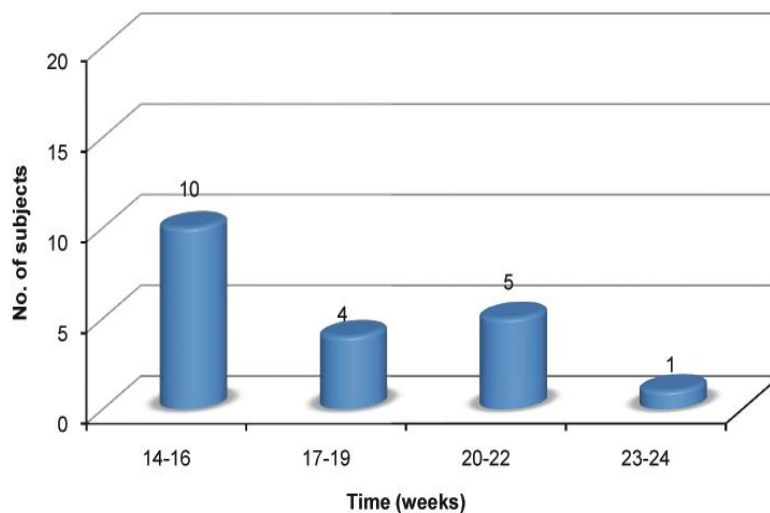
- Antero-lateral-parapatellar approach,
- Posteromedial approach.

Regular follow up of the patient in OPD with X-rays was done. All long term complications like non union, mal union, angular deformity, implant breakage, shortening or infection were recorded. Secondary surgical procedures which were done in the patients were also analyzed. The patient was under follow up till the bony union of the fracture occurs or up to 6 months, whichever is earlier. The final result was based on the functional and radiological outcome.

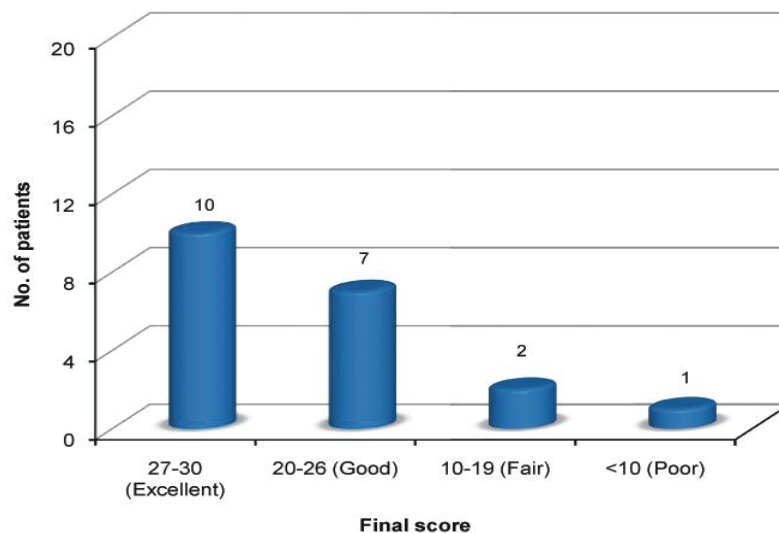
## Results

In case of highly comminuted fractures, i.e, Schatzker Type V & VI, Dual plating (*Lateral L.C.P and Medial buttress plate*) was applied in (14) 30%

**Graph 1:** Graph showing time taken for union



**Graph 2:** Graph showing functional outcome using sanders knee score



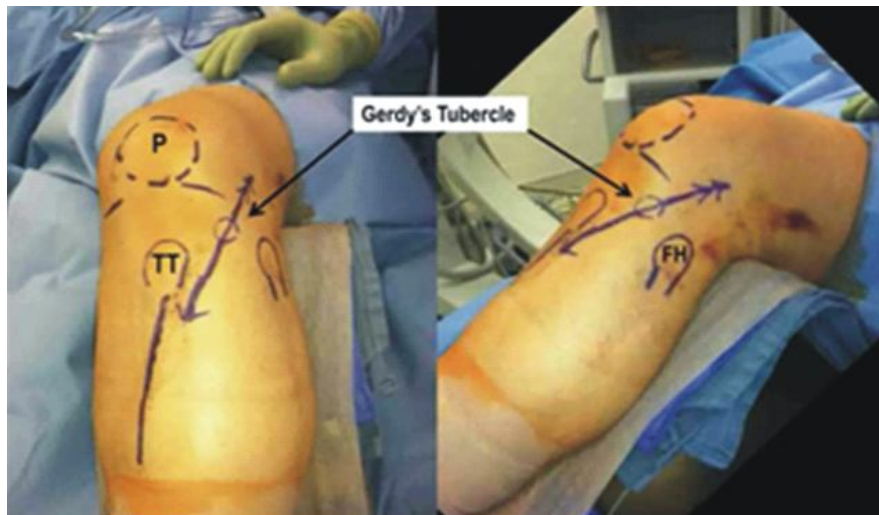
**Pre operative planning**

XRAY, CT and 3d reconstruction

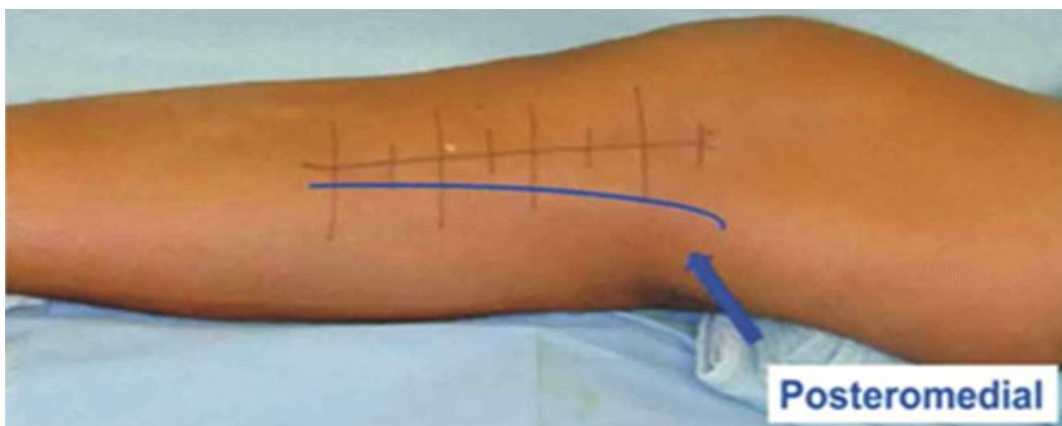


**Intra-operative planning**

Lateral Incision



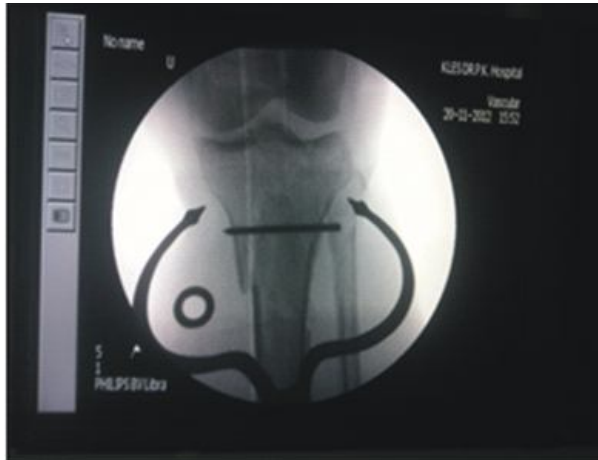
Medial Incision



**Intra Operative Steps Using Fluoroscopy**

**Intra Operative Steps**

Articular surface restored using tenaculum clamp  
With knee flexed over wooden plank



**Lateral View**

Articular surface restored using, 6.5 mm  
Cannulated cancellous screws



**Lateral Locking Plate Application**



**Medial Buttress Plate Application**



Pre op x-ray

**Result-Excellent case**



Post op

Follow up



6 weeks

3 months

6 Months



Flexion

Functional results



Extensio



of the cases, (6 cases), (2 Type V & 4 Type VI) were operated with Lateral Locking plate. The healing process was determined both clinically and radiographically. In our study the mean time to union was 17.6 weeks, with 50 % of fractures uniting in 14-16 weeks. Complication in the form of infection was observed in two cases (10%). Also there were four cases of compartment syndrome and one case each of malunion. Additional procedure of cortico-cancellous bone grafting (in four patients) in view of depressed fracture fragments. This was done in the primary setting itself. Sanders score was applied to analyze the functional outcome among the cases. After evaluation it was observed that 85% of patients had done good to excellent performance. Two patients had fair results and one performed poorly.

### Conclusion

Locking plate is a sound option for the treatment of bicondylar tibial plateau fractures. It provides stable internal fixation with a low rate of complications and very good clinical results [10]. Thus, proximal tibial locking plate is a good device to stabilize the fractures of proximal tibia especially when used in conjunction with meticulous intra operative handling of soft tissues and active participation of the patients in rehabilitation programme [7-9]. No method can be used routinely for all fractures, and each patient must be evaluated individually. Although the initial results in patients with variety of fractures with locking plates are encouraging, it is increasingly evident that failures do occur. In summary, locking compression plate is an efficient bone stabilization device even in cases with soft tissue injuries.

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