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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/10920

DOI URL: <http://dx.doi.org/10.21474/IJAR01/10920>



RESEARCH ARTICLE

A STUDY OF SURGICAL MANAGEMENT OF PROXIMAL TIBIA FRACTURES TREATED WITH LOCKING COMPRESSION PLATE

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Manuscript Info

Manuscript History

Received: 08 March 2020

Final Accepted: 10 April 2020

Published: May 2020

Key words:-

Proximal Tibia Fracture, Locking Compression Plate, Minimally Invasive Percutaneous Plate Osteosynthesis

Abstract

Introduction: Tibial plateau is one of the most critical load bearing areas in the human body. Fractures of tibial plateau affects knee alignment, stability and motion. Incidence of proximal tibia fractures is increasing due to increasing incidence of road traffic accidents. The recent development of locking compression plate (LCP) has revolutionized the treatment of proximal tibia fractures by overcoming the drawbacks of conventional buttress plate. The aim of the study is to evaluate the functional outcome of proximal tibial fractures fixed with locking compression plate.

Materials and Methods: This study is 15 patients involving proximal tibia fracture managed using LCP [10 patients with minimally invasive plate osteo-synthesis, (MIPO) technique and 5 patients with Open reduction and internal fixation (ORIF) technique]. We followed up all the patients until complete union of fractures.

Results: The average time for union of fracture was 16 weeks (range: 12-24 weeks). Overall 80% patients had acceptable outcome. Patients treated with MIPO technique healed earlier and more frequently had excellent results than those treated with ORIF. A total of three patients had complications (knee joint stiffness in 1, postoperative loss of reduction in 1 and infection in 1).

Conclusion: Locking compression plate system acts as a good biological fixation for proximal tibia fractures even in difficult fracture situations. MIPO technique offers short duration of procedure, less blood loss, less soft tissue injury and wound healing was better and faster healing, and better clinical outcome than ORIF in patients with proximal tibia fracture. However MIPO demands more surgical techniques.

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Introduction:-

Tibial plateau is one of the most critical load bearing areas in the human body. Fractures of tibial plateau affects knee alignment, stability and motion. Incidence of proximal tibia fractures is increasing due to increasing incidence of road traffic accidents. Fractures of proximal tibia are difficult to treat because of subcutaneous location of anteromedial surface. Majority of the fractures are due to high speed velocity accidents or fall from height where fracture results from direct axial compression with varus or valgus force and indirect shear forces. Elderly patients are likely to sustain depressed type of fractures.

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Appropriate management of fracture will be of paramount importance in maintaining mobility. The recent development of locking compression plate (LCP) has revolutionized the treatment of proximal tibial fractures by overcoming the drawbacks of conventional buttress plate.

The aim of the study is to evaluate the functional outcome of proximal tibial fractures fixed with locking compression plate.

Materials and Methods:-

We studied 15 patients involving proximal tibia fracture managed using LCP [10 patients with minimally invasive plate osteosynthesis, (MIPO) technique and 5 patients with Open reduction and internal fixation (ORIF) technique]. We followed up all the patients until complete union of fractures

Inclusion criteria:

1. a.Age>18 years of either sex
2. b.Intra articular and extra-articular fractures of proximal tibia.

Exclusion criteria:

1. a.<18 years.
2. b.Type 2,3 open fractures (gustillo Anderson)
3. c.Pathological fractures
4. d.Patient with severe comorbidities

Surgical technique locking compression pating:

Patient placed in supine and under Spinal anaesthesia,and Pneumatic tourniquet was applied after exsanguinations and time noted.

Patient was scrubbed draped and painted with betadine

Through anterolateral approach, intraarticular fractures were exposed and reduced anatomically, whereas extraarticular fractures were treated through MIPPO technique.

After achieving reduction, appropriate sized plate was taken and fracture was stabilized using cortical and locking screws. Cortical screws were put before putting locking screws.

The average time taken for surgery in case of MIPPO technique was 50 minutes (range, 40-60 minutes) and 75 minutes (range, 60-90 minutes) in case of open reduction and internal fixation.

The major intra-operative problems encountered were in case of comminuted fractures that were tried to reduce by MIPPO technique and later converted to open reduction after unsuccessful attempts.

Tourniquet was released and haemostasis secured.

Wound closed leaving suction drain insitu.

Postoperative:

Postoperatively, the patients were mobilized after removal of drains, for 2-5 days the range of motion allowed was 0-20degree, from the 5th day the range of motion was gradually allowed to be increased to 90degree or more. After suture removal on 12-14th day if no complications, full range of movement was allowed. An immediate postoperative x-ray was also done. Intravenous antibiotics were given for 48 hours in case of closed fractures and more as required in case of open fractures. Analgesics were given till adequate pain relief was obtained. The patients were advised quadriceps exercises, early active knee mobilization and non-weight bearing crutch walking, on discharge. In case of comminuted fractures with unstable fixation, external support was given in the form of slab and mobilization was started after confirming the healing process clinically and radiologically.

Follow up:

After suture removal, follow up was done at 6 weeks during which patient were clinically evaluated and an x-ray was taken to look for signs of fracture union and loss of reduction if any. The second follow up was done at 3 months during which one more x-ray was done and a clinical evaluation of union done. Based on the clinical and radiological signs of union patients were allowed partial weight bearing and gradually progressed to full weight bearing. Partial weight bearing was delayed until 6 – 8 weeks and full weight bearing allowed after 12-16 weeks if fracture union seen. The patients were then followed up at 6 months during which time the anatomic and functional evaluation was done

Results:-

Results were analysed in reference to age, gender, type of fracture, time of union, complications.

Table 1:- Demographic distribution AGE.

AGE IN YEARS	NUMBER OF PATIENTS	RESULTS
<20	2	14%
20-40	10	66%
>40	3	20%
Total	15	100%

Table 2:- Gender.

GENDER	NUMBER OF PATIENTS	%
Male	13	87%
Female	2	13%
Total	15	100%

Table 3:- Based On Type Of Fracture.

TYPE OF FRACTURE	NUMBER OF PATIENTS	%
I	3	20%
II	1	7%
III	0	0%
IV	3	20%
V	4	27%
VI	4	27%

Table 4:- Method Of Reduction.

METHOD OF REDUCTION	NUMBER OF PATIENTS	%
MIPPO	10	67%
ORIF	5	33%
TOTAL	15	100%

Table 5:- Time Of Union.

DURATION IN WEEKS	NUMBER OF PATIENTS	%
<12	0	0
12-16	13	87%
>16	2	13%

Table 6:- Range Of Movements.

RANGE OF MOTION	NUMBER OF PATEINTS	%
<120	10	67%
90-120	2	13%
<90	3	20%
TOTAL	15	100%

Table 7:- Complications.

COMPLICATIONS	NUMBER OF PATIENTS	%
NONE	11	73%
KNEE STIFFNESS	3	20%
IMPLANT FAILURE	0	0
NONUNION	0	0
INFECTION	1	7%
TOTAL	15	100%

Table 8:- Clinical Results.

CLINICAL RESULTS	NUMBER OF PATIENTS	%
EXCELLENT	10	66
GOOD	2	14
FAIR	3	20
POOR	0	0
TOTAL	15	100

CASE 1:-



PRE OP XRAY

POST OP XRAY

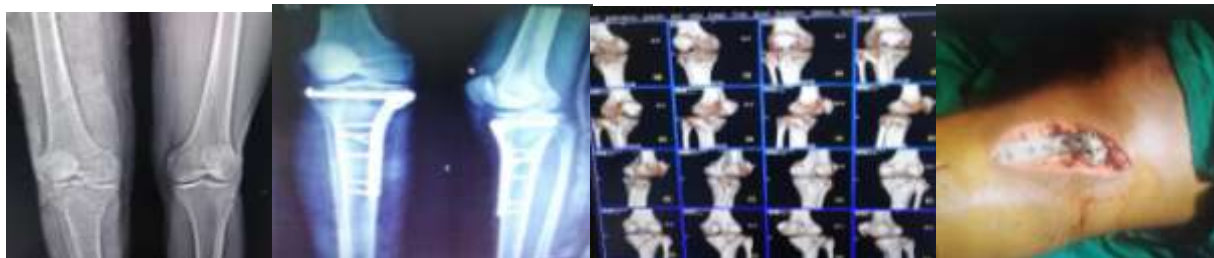


INTRA OPERATIVE

FLEXION

EXTENSION

CASE:2



Discussion:-

Proximal tibia fractures are the most common intraarticular fractures occur due to RTA. The most common mechanism resulting in fracture is valgus force with axial loading. They may be of high energy or low energy injuries. Low energy fractures are seen in osteoporotic bones and typically are depressed fractures. High energy injury results in splitting fractures. Schatzker et.al proposed classification system of condyle fractures based on fracture pattern and fragment anatomy.

Type-1: split fracture of lateral plateau

Type-2: split with depression of lateral plateau

Type-3: central depression fracture

Type-4: medial plateau split fracture

Type-5: bicondylar fracture

Type-6: plateau fracture with dissociation of metaphysis and diaphysis

Conclusion:-

Locking compression plate system acts as a good biological fixation for proximal tibia fractures even in difficult fracture situations. MIPO technique offers short duration of procedure, less blood loss, less soft tissue injury excellent, wound healing and faster and better clinical outcome than ORIF in patients with proximal tibia fracture. However MIPO demands more surgical techniques.

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