ARIPET	ORIGINAL RESEARCH PAPER		Orthopaedics
	A STUDY OF CLINICAL OUTCOME OF SURGICAL MANAGEMENT OF DISTAL TIBIA FRACTURE WITH LOCKING COMPRESSION PLATE		KEY WORDS:
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INTRODUCTION		Pre-operative Planning:	

Distal tibial fractures represent a significant challenge. They are only 1-10% of all lower extremity fractures. Treatment of distal tibia fracture was difficult before invention of LCP.Because nail, ordinary DCP failed to provide required stability.Invention of locking plates has revolutionalised treatment of distal tibia fractures even with small amount of bone, because of their versatality of fixed angular stability and specific designs which allow Morenoofscrews in distal fragment

Imaging:

Standard radiographs are AP, lateral, and mortise views of the ankle.

Advantages of locking compression plates:

- An LCP plate can be used as an internal fixator and permits stable bridging over shattered zones.
- The LCP system permits the combination of conventional and locking screws
- Locking the screw into the plate to ensure angular as well • as axial stability eliminates the possibility for the screw to toggle, slide or be dislodged & thus strongly reduces the risk of postoperative loss of reduction.
- Multiple angle stable screw fixation in the epiphyseal & metaphyseal region, allows for fixation of many fractures that are not treatable with standard devices.
- Improved biology for healing, there is absolutely no interference with periosteal blood supply. Maintained bone perfusion decreases infection rate, bone resorption, $delayed \& {\it non-union}, \& {\it secondary} \ loss of reduction.$
- Better fixation in osteoporotic boneNo or less need for primary bone graft
- Advantage in osteopaenic bone or multi fragmentary fractures

Disadvantages of locking compression plates

- The surgeon has no tactile feedback as to the quality of screw purchase into the bone as he tightens the screw.
- Current locking plate designs can be used to maintain fracture reduction but not to obtain it
- Inability of the surgeon to alter the angle of the screw within the hole & still achieve a locked screw.
- Any attempt to contour locked plates could potentially distort the screw holes & adversely affect screw purchase.

METHODOLOGY

This is a retrospective study from FEBRUARY 2019 TO AUGUST 2021.20 Adult patients with fractures of lower third tibia admitted to V.M.M.C AND H.has taken for this study.

Inclusion Criteria:

- Adults (aged more than 18 years) males and females 1
- 2 Tibial fractures involving lower 1/4th having less than 7
- 3 Complex fractures of the lower third of tibia

Exclusion Criteria:

- 1 Patients aged below 18 years.
- Patients medically unfit for surgery.
- 3 Patients with compound fractures

Pre-operative Planning:

- Status of soft tissues most of time decides timing of surgery like presence of blisters, abrasions, amount of oedema all this things taken into consederation.
- If soft tissue injury is less we take patient as early as possible for ORIF.
- If soft tissues are compromised surgery will be postponed for 5-10 days till wrinkle sign appears.

Implant Selection

- According to x-ray, CT fracture geometry asessed
- Most of fractured can be treated with lower medial anatomical LCP
- Recon locking plate has to be kept to fix additional fragments in a buttress mode to fix fibula if it is involving lower7cmoffibula.

SurgicalTechnique

- All patients operated under SA, under torniquet control
- Close reduction done, quality of reduction checked under CARM control
- If there is good reduction, we did MIPPO, through 5cm distal tibial incision without exposing fracture site after isolation of great saphaneous vein.
- If fracture site not reduced properly incision extended above and anatomical reduction done without stripping periosteoum.
- Plate position confirmed in AP and LAT view.
- Ideal plate position is lowest screw should be just above tibial plafond and should be parallel to it.
- Atleast there should be 4 screws in distal fragment.
- In LAT view plate should be in centre of bone both in prox. and distal end, it has to be checked under C-ARM position secured with k-wires.
- Ordinary cortical screws are applied first before putting locking screws
- 3.5mm Locking screws introduced into distal end,it should be verified for its lenghth and placement.
- Proximally longer plates are selected to ensure screw density ratio.

Operative Photographs



Incision



Reduction Of Fracture And Positioning Of Plate

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16

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Proximal Fixation



Checking Under Image Intensifier



Complete Skin Closure Of Operative Wound

Arumugam 59y/m Preoperative



Postoperative



Postoperative

- Active toe,ankle,knee mobilisation started from post op day 1.
- IV antibiotics given for 3-5 days.
- Patient kept strict non weight bearing till 8 weeks.

Follow Up

- Regular follow up of 1 month done.
- At the end of 2nd month after seeing early radiological signs of union partial weight bearing with walker allowed.
- Full weight bearing allowed only after complete radiological union which is usually around 3-4 months.

RESULTS

- The present study consists of 20 cases of fracture of the distal metaphyseal end of tibia. All the cases were fixed using locking compression plate. The study period was from JAN 2012 to DEC 2013.
- 1 Age distribution-The age of the patients ranged from 23-62 years with the fracture being most common in the 4th and 6th decade and an average age of 42 years
- 2 Sex Distribution-Out of 20 patients, 14 (70%) patients were males and 6 (30%) patients were females showing male preponderance because of traveling and working in fields and factories
- **3** Side affected-There were 14(70%)patients with right distal tibia fracture 6(30%)patients with left distal tibial fractures.
- **4** Mode of injury-In our study, 14(70%) of patients sustained injury following road traffic accidents is 6(30%) patient sustained injury following fall.

Fracture Characteristics-

- Fracture Pattern- The fracture pattern was classified based on Rudie & Allgower classification for fractures of distal tibia of the 20 cases studied, 4 (22%) cases were Al, 7(35%) were A2,9(43%) were A3.
- 6. Duration of Surgery- Of the 20 cases treated with locking compression average it took 1 hr duration
- 7. IMPLANT USED-out of 20 pts for 10 cases done medial plating alone,
- Except in 5 cases fibula plating done in others Additional plating in tibia is required in 3 cases.
- Duration of fracture union-Out of 20 patients 15 patients united well in 3 months,5 patients went for delayed union it took 6-9 months.
- **9. Infection**-There was no deep infection in our study,3 patients went for superficial wound problems which settled in 1 month without any additional procedure.

CONCLUSION

- LCP is versatile implant for addressing distal tibial fracture.
- If principles of LCP fixation practiced meticulously and soft tissue issues adressed properly we can achieve good to excellent results.