



EVALUATION OF THE FUNCTIONAL OUTCOME IN EXTRA-ARTICULAR DISTAL THIRD TIBIA FRACTURES MANAGED BY MIPPO TECHNIQUE USING DISTAL TIBIA LOCKING PLATE.

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INTRODUCTION

Distal tibia fractures represent a significant challenge to most of the surgeons even today. They constitute 1-10% of all lower extremity fractures. Operative treatment is indicated for most tibia fractures caused by high energy trauma, which allows early mobilization, avoids shortening and other complications associated with prolonged immobilization. Conventional ORIF have been associated with complications like infection and delayed or non-union due to devitalization of bony fragments and additional damage to the soft tissues. Intramedullary nails often do not provide enough stability¹.

Recently, the trend is towards use of a Locking compression plate for treatment of fractures of the distal part of the tibia. Minimally invasive percutaneous plate osteosynthesis (MIPPO) is a technique which aims to reduce iatrogenic soft tissue injury and damage to bone vascularity, as well as preserving the osteogenic fracture hematoma². The purpose of this study was to evaluate the functional outcome, duration of union, advantages and complication following use of MIPPO with LCP for meta-diaphyseal fractures of distal tibia.

MATERIALS AND METHODS

This prospective study conducted in MVJMC included 240 patients treated by MIPPO.

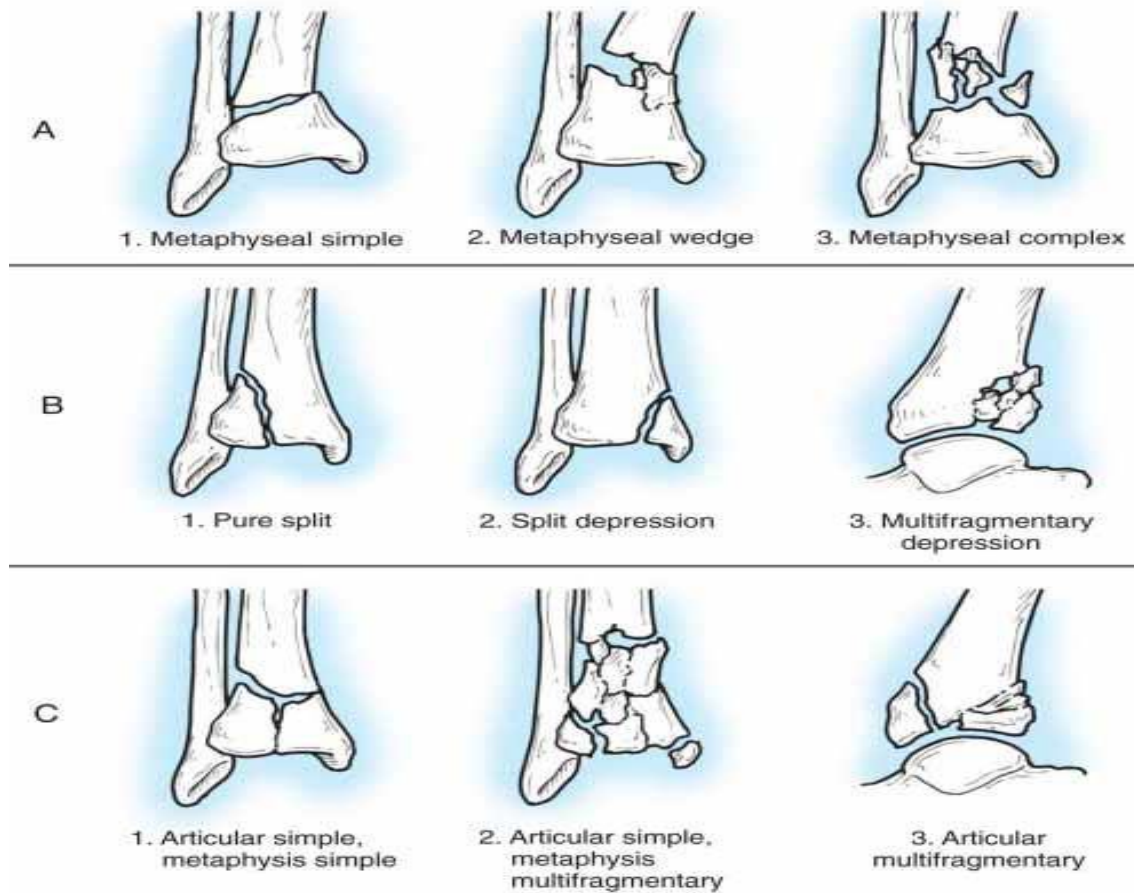
• Inclusion criteria

1. Adults (aged >18 years) males and females.
2. Type-A #s according to AO classification.

• Exclusion criteria

1. Open fractures.
2. Type-B&C #s according to AO classification

AO/OTA CLASSIFICATION



SURGICAL TECHNIQUE:

Medial approach is used for the MIPPO technique. LCP inserted from distal to proximal through epi-periosteal tunnel between periosteum and intact soft tissue, fixed by locking screws³. In associated fibula fractures, fibula was fixed first.

INSTRUMENTS:



POST-OPERATIVE REGIMEN:

- Analgesics & Antibiotics.

- DVT prophylaxis.
- Early non-weight bearing mobilization, ankle range of movement exercises - post op DAY 1⁴.

FOLLOW UP

The pts were followed up at intervals of 2wks, 4wks, 6wks, 3mnts, 6mnts, 10mnts and 12mnts to assess the radiological union. Pts were assessed at the end of follow-up by **Ovadia and Beals scoring system**⁵ which includes both objective and subjective evaluation of the patients.

OVADIA AND BEALS SCORING SYSTEM

- **Subjective criteria:-** Pain, Return to work, Recreational activity, Limited walking, Pain medication, Limp.
- **Objective criteria:-** Ankle/subtalar motion, Tibio-talar alignment, Tibial shortening, Chronic swelling, Equines Deformity.

SUBJECTIVE CRITERIA:-

Rating	Pain	Return to work	Recreational activity	Limited walking	Pain medication	Limp
Excellent	None	Same work	Normal	No	None	None
Good	Mild	Same work	Mild modification	No	None	None
Fair	Moderate	Modified	Significant modification	Yes	Non narcotic	Occasional
Poor	Severe	Unable	None	Yes	narcotic	Yes

OBJECTIVE CRITERIA:-

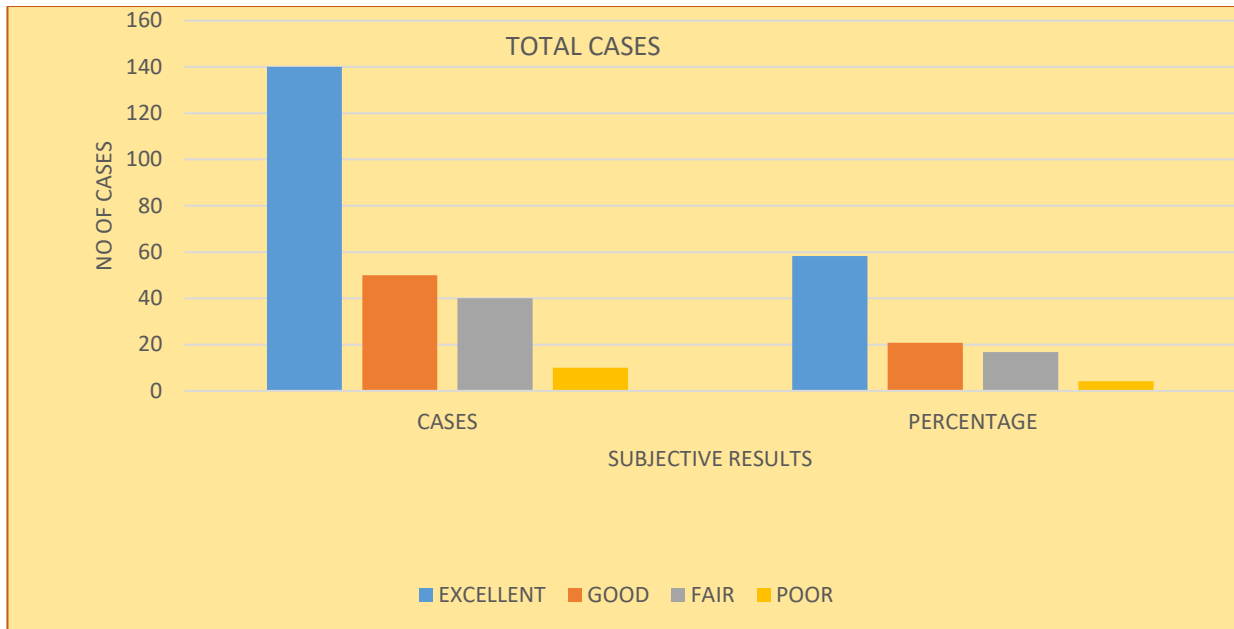
Rating	Ankle/ subtalar motion	Tibiotalar alignment	Tibial shortening	Chronic swelling	Equines Deformity
Excellent	>75% normal	Normal	None	None	None
Good	50-75%	Normal	None	Minimal	None
Fair	25-50%	<50 angulation	<1cm	Moderate	None
Poor	<25%	>50 angulation	>1cm	Severe	Present

RESULTS

- The mean age of the study group was 40.8 yrs (Range 22-58yrs).
- MALE= 160 pts; FEMALE= 80 pts.
- This study included 170 patients (70.8%) sustained injury following RTA and 70 patients (29.1%) sustained injury following fall from height.
- Out of the 240 cases studied, 50 are A1, 80 are A2, 110 are A3.
- 160 out of 240 cases studied had an associated fracture of the lower 3rd of fibula and 80 had upper 3rd fibula fracture.
- All the #s united with an average of 22wks.
- Fractures of 60(25%) pts united in 18wks, 80(33.3%) pts united in 20wks, 80(33.3%) pts united in 24wks and 20(8.3%) pts united in 26wks.

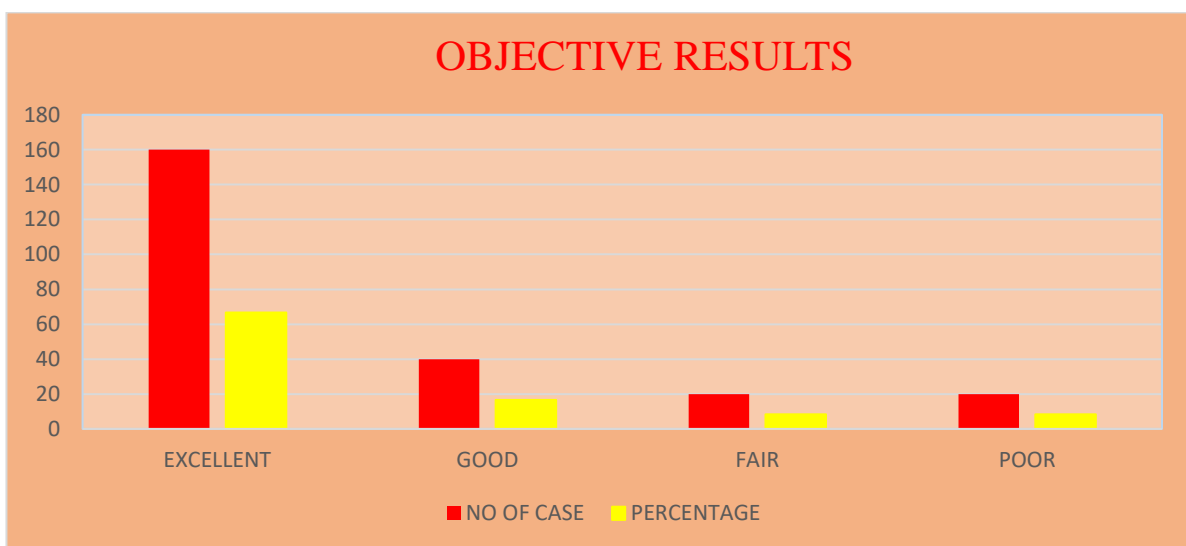
SUBJECTIVE RESULTS

RESULTS	NO OF CASES	PERCENTAGE
EXCELLENT	14	58.3
GOOD	5	20.8
FAIR	4	16.7
POOR	1	4.2



OBJECTIVE RESULT

RESULTS	NO OF CASES	PERCENTAGE
EXCELLENT	160	66.7
GOOD	40	16.7
FAIR	20	8.3
POOR	20	8.3



POST-OPERATIVE COMPLICATIONS

1. 10 pts developed superficial skin infections.
2. 30 pts had ankle stiffness, which ranged from restriction of ankle movement from 20-40%.

RADIOGRAPHS:-PRE-OP:



POST-OP:



FOLLOW-UP:24wks



DISCUSSION:

- Fractures of the distal tibia were among the most difficult fractures to treat effectively.
- The primary goal of operative treatment is to anatomically align the fracture fragments while providing enough stability to allow early motion.

- This is achieved with minimal bony and soft tissue devascularization in order to decrease the complications resulting from the surgery.
- Gao *et al*⁶. studied 32 adult pts with very short metaphyseal fragments in fractures of distal tibia treated with a polyaxial locking system. The polyaxial locking system shown results of 87.3% excellent to good functional out come.
- Hazarika *et al*⁷. studied a series of 20 pts of distal tibia fracture treated using LCP through MIPPO technique, which showed 87.5% of good to excellent results.
- At the end of the our study of 24 pts treated, 14(58.3%) pts had excellent outcome, 5(20.8%) had good results, 4(16.7%) had fair outcome and 1(1.2%) had a poor result.
- Cory collinge *et al*⁸. had an average union of 21wks and Abid mushtaq *et al*. had an average of 22wks. Our study had an average fracture union of 22wks.

CONCLUSION

- According to this study, 240 pts with distal tibia fracture(extra-articular) treated with MIPPO technique, states that this method has resulted in strong and effective stabilization of the fractures.
- This provided good stability, allows early range of motion at ankle and fracture union⁹.

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