

Comparative Study Between CRIF VS ORIF in Lower Fibula Fracture At Syndesmotic Level With/Without Lower Tibia Or Medial Malleolar Fracture

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Keywords: NIL

Introduction

Ankle is distal most weight bearing joint and locomotion depends upon stability of ankle mortise. The best option for management of distal fibula fracture remains unclear due to availability of various implants and different types of fractures.

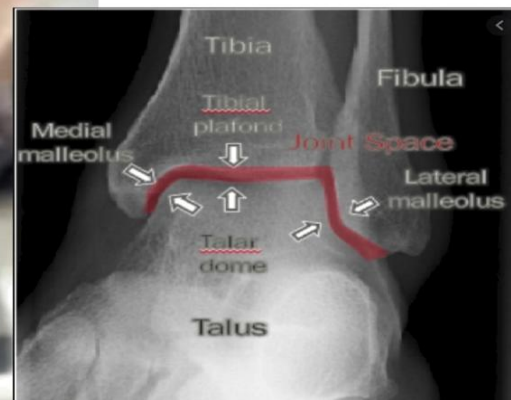
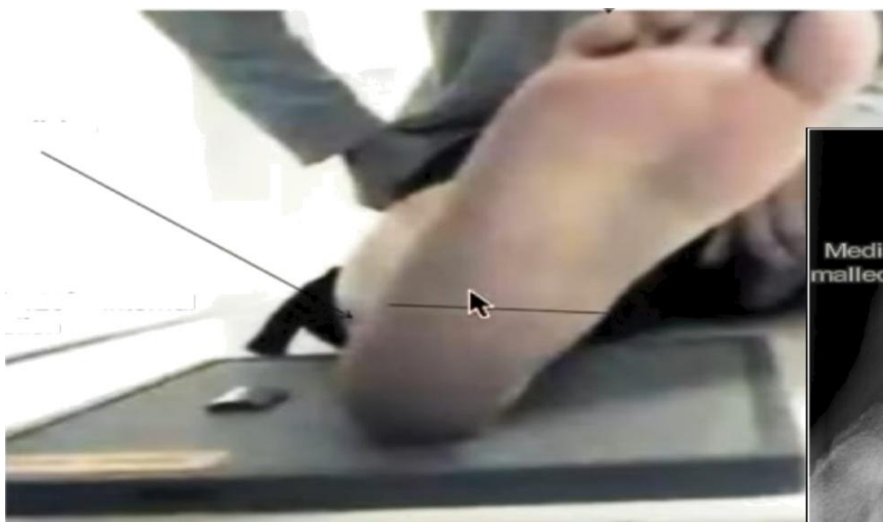
The ankle is a hinge joint and has two articulation points,

1) between distal parts of tibia and fibula

2) between tibia and talus.

Mostly weight is transferred by the tibio talar surface and only 1/6 part of weight is transferred by the fibula side. Thus mortise view is very important in case of any fracture management of the ankle joint as it shows the talar dome so greatly that weight bearing results can be assessed properly.

Any fracture line if altering distal part of the tibia forming ankle joint is called pilon fracture.



Rotational force > axial forces have more chances of malleolar fracture. Whereas axial force > rotational force have more chances of pilon fractures.

although conservatively managed before, surgical management has become standard treatment modality for these fractures .

We compared the fixation of fibula by using fibula nail and fibula plate



Danis Weber Classification

The Danis-Weber classification is a simple system for classification of lateral malleolar fractures, relating to the level of the fracture in relation to the ankle joint, specifically the distal tibiofibular syndesmosis. It has a role in determining treatment.



Classification	Description	Notes
Type A	Fracture distal to ankle joint	Often av ligament
Type B	Fracture at the level of the Tibiofibular ligaments	Tibiofibu about 50
Type C	Fracture above the ankle joint	Tibiofibu

Materials And Method

Our study was prospective, randomised, single-blinded study on the patient and 62 patient were taken for this study in which 39 patients are were fixed by nailand other 23 were fixed by plate within 1 year period from 1st SEPTEMBER 2020 to 1st SEPTEMBER 2021 in dept. of orthopaedics, Dhiraj hospital Vadodara.

Radiological investigations for this type of fracture are antero-posterior and lateral view and ct scan of the ankle joint.

Operations generally done before maximum swelling occurs or after the initial swelling was resolved. All patients received prophylactic antibiotics before surgery, as it was carried out as early as possible subsequent swelling and skin problem.

Inclusion Criteria: close fracture with or without associated with tibia fracture, age > 21 years, patient willing for treatment and who gave written consent.

Exclusion Criteria: open fracture, medically unfit patient, fracture line > 8 cm, age <21 years, tibial Pilon Fracture.

Fixation Of The Fibula Fracture

Position given : supine

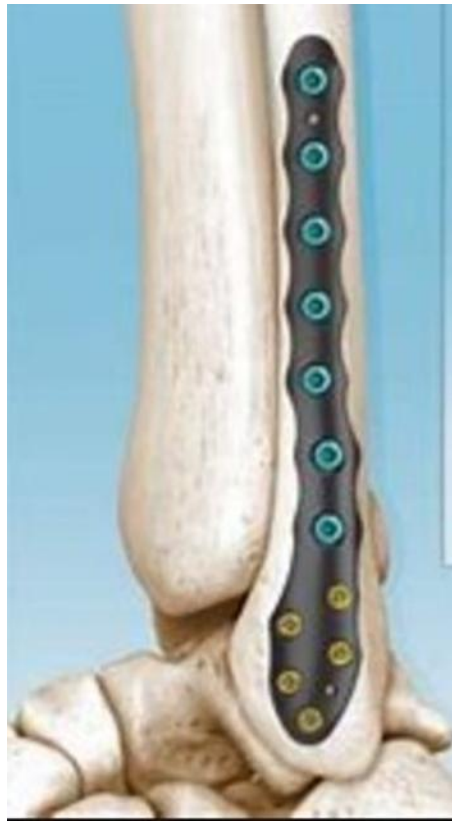


Plating

Fibula bone is usually very easy to approach. I usually prefer a postero lateral approach and like to place plate at postero lateral surface of fibula instead of lateral to avoid impingement. Three type of plates

are used: 1) 1/3 semi tubular 2) anatomical fibular plate 3)reconstruction plate. In case of semitubular plate and reconstruction plate pre bending to give valgus bend to the plate is necessary.

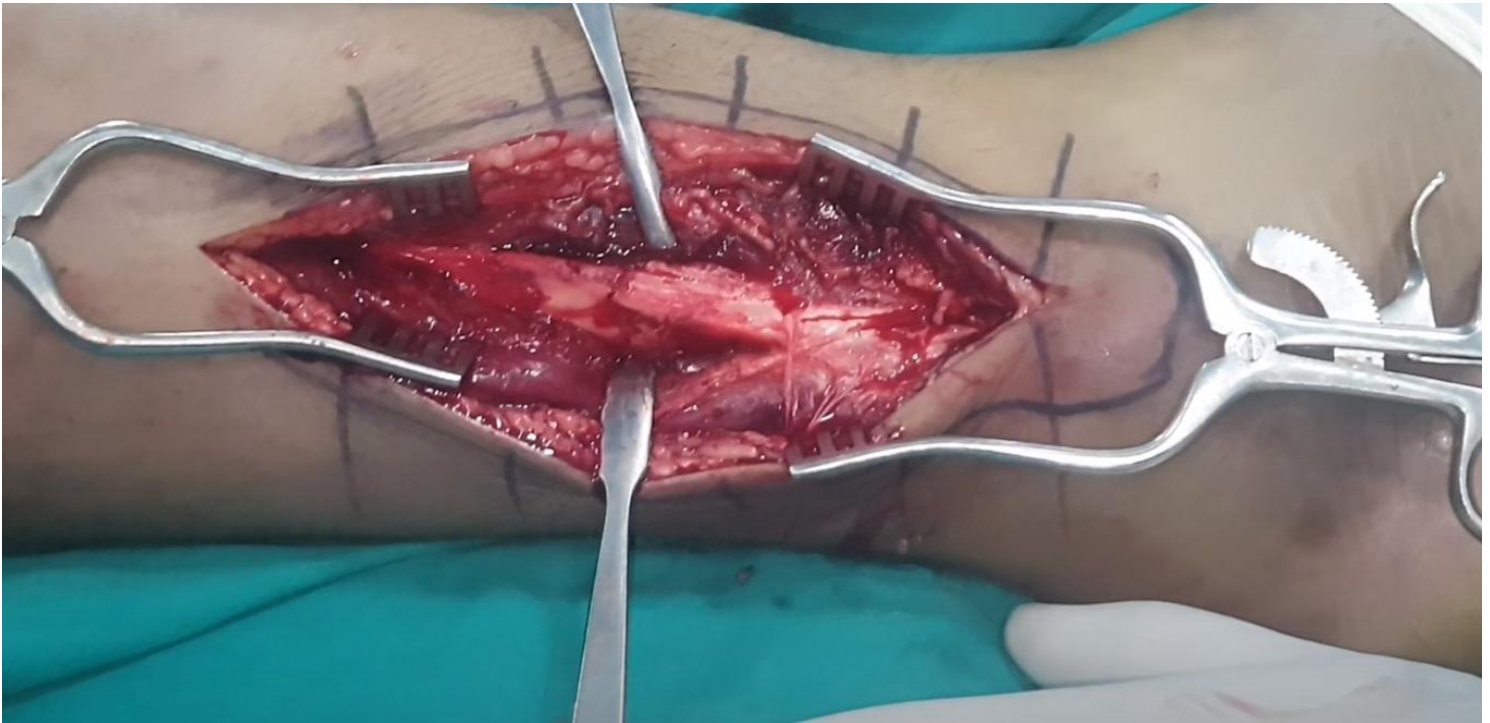




Approach:

landmark for skin incision: proximal - 10 cm proximal from tip of lateral malleoli; distal- tip of lateral malleoli.
Note that skin incision should be slight posterior as we are planning for postero lateral plate placement.





After superficial incision of skin we do soft tissue dissection, dissect superficial fascia and cauterize bleeding points, then deep fascia is dissected. Two flaps anterior and posterior are retracted by a self retaining retractor. Then with the help of a periosteal elevator we clear the fracture site. Remove hematoma and any debris present at the fracture site. Then proper wash is taken slowly as we can see the fracture line clearly and it is easy to reduce fracture.



After proper reduction , clamp the fracture site to hold reduction and plate placement done. Plate is fixed with 3 cortical screws proximally and 2 or 3 cortical screws distally. Then proper stability of fracture is checked by all movement of the ankle joint after removing clamp. then the proper wash of normal saline or ringer lactate is given. Closure done in layers: 1) fascia by 1-0 vicryl 2) subcutaneous tissue by 1-0 vicryl and 3) skin by 1-0 epimide. Proper sterile dressing is placed.

Nailing

- 1) In a transverse fracture, a fibula nail(square nail) was used.
- 2) Expose the tip of the lateral malleolus by splitting the fibres of the calcaneofibular ligament longitudinally. Insert the nail across the fracture line into the medullary canal after making an entry at the tip of the lateral malleolus with a bone awl.
- 3) Intrame
- 4) dulatory nail fixation of fibula is minimally invasive with an incision of 1 cm in length. Chances of wound infection are less as compared to plating. Chances of fracture healing are high as compared to plating.
- 5) Fibula nailing is also useful in type B weber fracture is elderly patients with

osteoporotic bones as plating is difficult in osteoporotic bones.

POST OP PROTOCOL

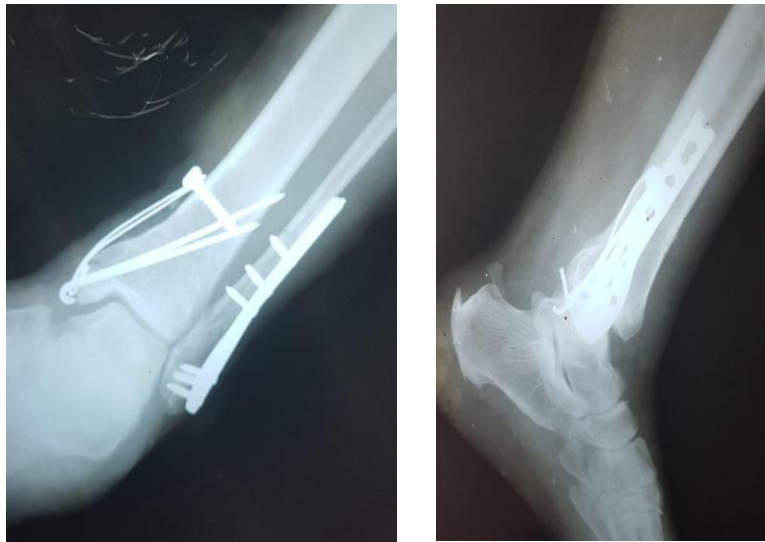
1. Postoperative immobilisation of the ankle joint was done by the below-knee slab for 15 days in case of plating.
2. Suture removal done after 15 days of surgery.
3. Below knee cast with ankle is 90* position was given for 4 weeks in fibula nail patients and after 4 week later the cast was removed and clinical examination was done to examine tenderness and movement of the ankle. Physiotherapy was explained to patients in that active movement of the ankle without weight bearing.
4. After 6 weeks x-ray were taken to check signs of fracture union and then partial weight bearing was started for a period of 4-6 weeks with crepe bandage and limb elevation and active mobilisation of the ankle joint explained to the patient.
5. Patients were then allowed to bear full weight without support after 12 weeks.
6. Regular follow-up was done at 15 days, 1 month and 3 months after discharge.

Case 1 :40/m closed # bimalleolar rt side without dnvd came to Dhiraj hospital on 17th September 2020 nd operated on 18th September 2020 and follows:

Preop:



1 month follow up



3 Months Follow Up



Case 2

47/M closed# bimallolus lt side without dnvd came to Dhiraj hospital on 23th august 2020 and operated on 24th August 2020 and follows:

Preop



1 month followup



3 months followup



Results

COMPLICATIONS	NAILING	PLATTI NG
Wound infection	4	12
Wound dehiscence	0	9
Screw breakage	Nil	6
Delayed union	0	7
Non union	0	3
Ankle stiffness	13	2
Implant irritation	12	5
Implant backout	2	6

Deformity	NAILING	PLATING
Malalignment	12	03
Varus deformity	05	01
Valgus deformity	07	02

AGE GROUP	NAILING	PLATING
21-30	9	7
31-40	10	3
41-50	7	5
51-60	3	4
61-70	4	2
>70	6	2

Conclusion

Anatomical reduction is always important in all intra articular fractures, more so if a weight bearing joint like ankle joint is involved.

The fibular length has to be maintained for lateral stability of the ankle. ankle mortise congruity, restoration of the length of the fibula and restoration of syndesmotic integrity.

The four to six week period of immobilization did not affect the final range of ankle function as most patients had achieved full range of motion by the end of 12 weeks postoperatively with active exercise regimen.

We concluded that Fibula Plating is a better method of fixation in weber type B and C fractures. Intramedullary Nailing in Fibula is a better method of fixation in weber type A fractures with respect to clinical and functional outcomes.

We also concluded that if the ligament injury has been dealt with properly and repaired and the fixation is anatomically sound, then the period of immobilization (4 to 6 weeks) does not affect the range of motion of the ankle joint in the long duration.

comminuted fracture = plate

two part fracture=nail