

Original Research

Different treatment modalities for the management in lower fibula with medial malleolus fracture- A comparative study

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ABSTRACT:

Background: Common symptoms of a malleolar fracture are deformity around the ankle, swelling, hematoma, bony tenderness, instability and pain on attempting to walk. The present study compared different treatment modalities for the management in lower fibula with medial malleolus fracture. **Materials & Methods:** 48 patients of lower fibula with medial malleolus fracture of both genders were divided into 2 groups of 24 each. Group I comprised of patients managed with plating and group II patients were managed with nailing. Deformity and complications were compared between both groups. **Results:** Deformity such as malalignment was seen in 1 and 5 patients in group I and II respectively, valgus deformity in 3 and 6 in group I and II respectively and varus deformity in 2 in group I and 7 in group II patients. Common complications were screw breakage in 2 in group II, wound infection seen 1 in group I and 3 in group II, wound dehiscence 2 in group I and 1 in group II, ankle stiffness 1 in group I and 2 in group II, non- union 3 in group I and 4 in group II and delayed union 2 in group I and 5 in group II. The difference was significant ($P < 0.05$). **Conclusion:** Plating found to be better in terms of less post-operative complications than nail.

Key words: Medial malleolus fracture, Nailing, Plating.

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INTRODUCTION

The ankle is a hinge joint and having two articulation points, between distal parts of tibia and fibula and between tibia and talus. The ankle joint is most important joint for weight bearing purpose for which supportive movement occur between sub talur joint (between talus and calcaneum) and at ankle joint. Mostly weight is transferred by tibio talar surface and only 1/6 part of weight is transferred by fibula side. Thus, mortise view is very important in case of any fracture management of ankle joint as it shows talur dome so greatly that weight bearing results can be assessed properly.

Common symptoms of a malleolar fracture are deformity around the ankle, swelling, hematoma, bony tenderness, instability and pain on attempting to walk in the presence of such symptoms, clinical examination follows the principles of "look-feel-move". The biomechanics of the subtalar joint are such that violent inversion (supination) of the hindfoot

produces external rotation of the talus, causing a fracture of the distal fibula or a rupture of the lateral ligament. If talar rotation continues, the medial malleolus is avulsed and the deltoid ligament may rupture. The anterior tubercle gives origin to the anterior syndesmotoc ligament and at the posterior tubercle the very strong posterior syndesmotoc ligaments are attached. The important facts about malleolar fractures are intraarticular injuries. Soft-tissue injury is common as the bones are subcutaneous. Uni malleolar fractures are the most common (68%), followed by bi malleolar fractures (25%) and tri malleolar fractures (7%). The present study compared different treatment modalities for the management in lower fibula with medial malleolus fracture.

MATERIALS & METHODS

The present study was conducted among 48 patients of lower fibula with medial malleolus fracture of both

genders. All patients were informed regarding the study and their written consent was obtained. Data of patients such as name, age, gender etc. was recorded. All patients were divided into 2 groups of 24 each. Group I comprised of patients managed with

plating and group II patients were managed with nailing. Deformity and complications were compared between both groups. Results thus achieved were statistically analysed. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Method	Plating	Nailing
M:F	10:14	13:11

Table I shows that group I had 10 males and 14 females and group II had 13 males and 11 females.

Table II Age wise distribution of cases

Age Group (Years)	Group I	Group II
20-30	5	3
30-40	4	5
40-50	6	4
50-60	5	7
>60	4	4

Table II shows that age group 20-30 years comprised of 5 patients in group I and 3 in group II, 30-40 years had 4 in group I and 5 in group II, 40-50 years had 6 in group I and 4 in group II, 50-60 years had 5 in group I and 7 in group II and >60 years had 4 patients in each group.

Table III Assessment of deformity

Deformity	Group I	Group II	P value
Mal-alignment	1	5	0.02
Valgus deformity	3	6	0.05
Varus deformity	2	7	0.01

Table III, graph I shows that deformity such as malalignment was seen in 1 and 5 patients in group I and II respectively, valgus deformity in 3 and 6 in group I and II respectively and varus deformity in 2 in group I and 7 in group II patients. The difference was significant (P< 0.05).

Graph I Assessment of deformity

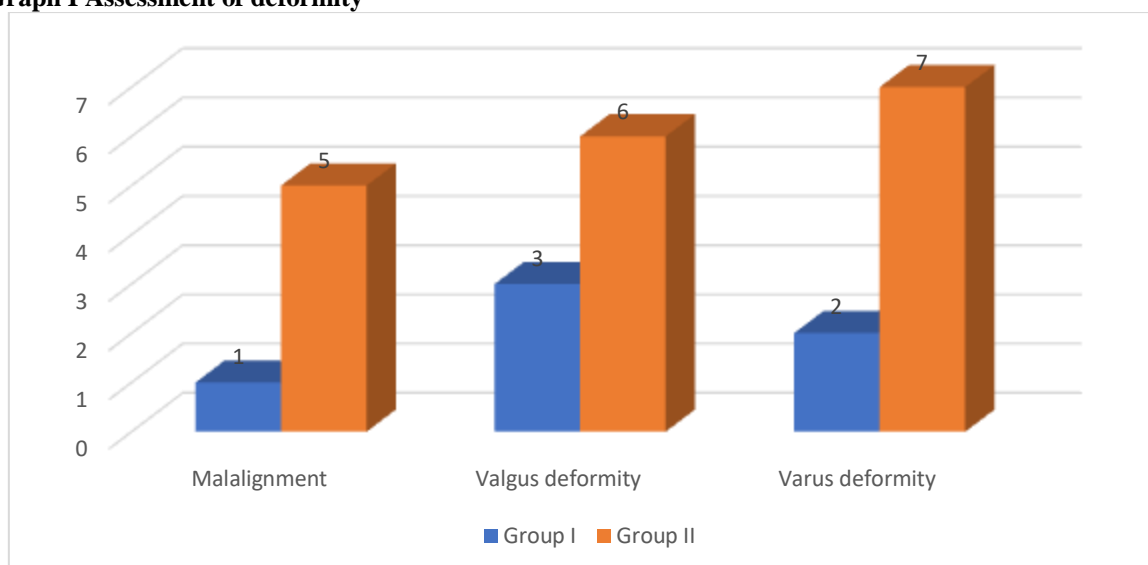
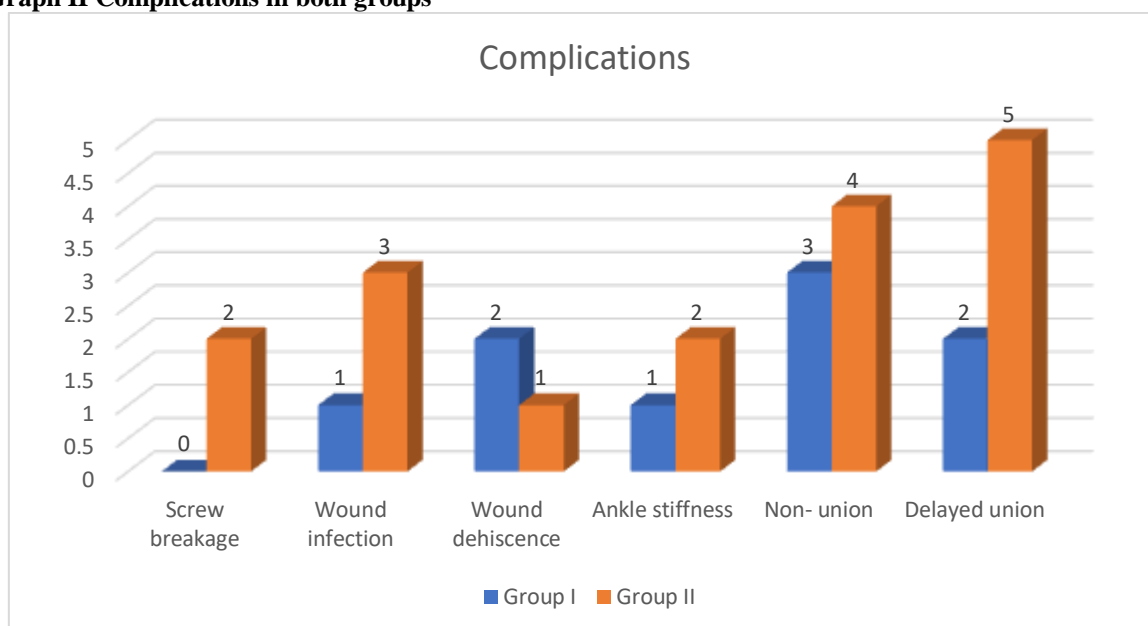


Table IV Complications in both groups

Complications	Group I	Group II	P value
Screw breakage	0	2	0.02
Wound infection	1	3	0.05
Wound dehiscence	2	1	0.17
Ankle stiffness	1	2	0.17
Non- union	3	4	0.91
Delayed union	2	5	0.01

Table IV, graph II shows that common complications was screw breakage in 2 in group II, wound infection seen 1 in group I and 3 in group II, wound dehiscence 2 in group I and 1 in group II, ankle stiffness 1 in group I and 2 in group II, non- union 3 in group I and 4 in group II and delayed union 2 in group I and 5 in group II. The difference was significant ($P < 0.05$).

Graph II Complications in both groups



DISCUSSION

Ankle fractures are extremely common and represent nearly one quarter of all lower-limb fractures. Techniques for fixation of displaced fractures of the lateral malleolus have remained essentially unchanged in recent decades. Centre of ankle joint is 3-4 mm lateral to centre of inter malleolar axis which is significant in case of extra medullary guidance for tibia piece in TKR from which mechanical axis of lower limb passes. Any fracture line if altering distal part of tibia forming ankle joint is called pilon fracture. And for this kinda fractures mortise view is most important to see talar dome which is main weight bearing part of ankle joint ligaments, capsule and other muscular structures around ankle joint gives stability to ankle joint and thus type of injury is very important in history as rotational injury will give soft tissue damage and ankle sprain. With this rotational injury if axial force will added than it would cause fracture at ankle joint. With rotational force > axial force, there are more chances to cause malleolar fracture and with axial force > rotational force, there are more chances for pilon fractures. Ankle injury

commonly seen frequently in road traffic accident and fall down from height. Ankle fractures are very common skeletal fractures it is important because weight is transmitted through it and locomotion depends on joint stability although conservatively managed before, internal fixation as become standard treatment modality for these fracture. The present study compared different treatment modalities for the management in lower fibula with medial malleolus fracture.

We found that group I had 10 males and 14 females and group II had 13 males and 11 females. Age group 20-30 years comprised of 5 patients in group I and 3 in group II, 30-40 years had 4 in group I and 5 in group II, 40-50 years had 6 in group I and 4 in group II, 50-60 years had 5 in group I and 7 in group II and >60 years had 4 patients in each group. Coifman evaluated the use of fibula intramedullary nailing based on minimal invasive surgical approach. Thirty-nine cases treated with fibula intramedullary nailing between the years 2014–2016 were retrospectively studied.¹¹ A fibular nail was utilized for the treatment of various ankle fractures either as

the sole method of fixation or combined with another method. Patient charts were reviewed for fracture patterns, comorbidities, quality of reduction, complications and additional surgeries. Out of 39 cases in the study cohort, 37 were closed fractures while 2 had an associated medial malleolus open injury. According to Weber classification of lateral malleolus fractures, 20 cases were type B, 18 cases type C, and one case of a pathologic fracture type B like fracture. Quality of reduction was based on previously published criteria. It was determined to be good in 32 cases, fair in 5 cases and poor in 2 cases that were revised intraoperatively to plate fixation. Overall no systemic complications occurred. Eight patients have undergone additional surgeries, namely hardware removals. In two cases, the nail was later revised to a different fixation method: one case to a plate, due to secondary displacement at 2 weeks, and one to an intramedullary tibiototalcalcaneal arthrodesis secondary to hardware failure and Charcot neuroarthropathy.

We found that deformity such as malalignment was seen in 1 and 5 patients in group I and II respectively, valgus deformity in 3 and 6 in group I and II respectively and varus deformity in 2 in group I and 7 in group II patients. Common complications was screw breakage in 2 in group II, wound infection seen 1 in group I and 3 in group II, wound dehiscence 2 in group I and 1 in group II, ankle stiffness 1 in group I and 2 in group II, non-union 3 in group I and 4 in group II and delayed union 2 in group I and 5 in group II.

Shah et al¹² compared complication and functional modalities in fixation of fibula in total of 62 patient in which 39 patient were operated by CRIF and 23 patient operated by ORIF Results: There was significant difference in rate of union as plating was found superior to nailing there were less complication in nailing as compare to plating and better functional score found with nailing.

The limitation of the study is small sample size.

CONCLUSION

Authors found that plating found to be better in terms of less post-operative complications than nail.

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