

Original Article

Outcome of different treatment modalities in old Ankle Injuries

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Ankle fractures are the most common form of fractures treated by orthopaedic surgeons. In this study we evaluated the results of late operative treatment of displaced ankle fractures. In our series, 30 patients were operated, followed up and their results were evaluated. Among them 17 patients had WEBER Type B injury (56.67%) followed by WEBER Type C (26.67%) and WEBER Type A (16.67%). Most of the cases (60%) were operated within 3-6 weeks. In most of the cases (27 cases, 90%) osteosynthesis was done and in only 3 cases (10%) ankle arthrodesis was done. More than half patients (17, 56.67%) were followed up for 13-18 months, 40% patients were followed up for 7-12 months and only one patient was followed up for 6 months. Scoring with AOFAS (American Orthopaedic Foot and Ankle Society's Ankle-Hindfoot Scale) score, at presentation the average AOFAS Score was 27.73, at 3 month postoperative it was 67.63 and at 6 months postoperative the score average was 83.33. They were all returned to their pre injury activities. In our study, we have seen that osteosynthesis is the mainstay of treatment because correction of malalignment lead to a better stance, better muscle balance and gradual correction of any foot deformities. Ankle arthrodesis is preferred as the primary procedure if extensive arthritic changes are present, there is associated old unreduced dislocations or if extensive corrective surgery will be required. In the Indian scenario, ankle arthrodesis may be preferred in manual labourers as it offers stable painfree ankle in a single procedure.

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Key words : Ankle fracture, Osteosynthesis, Arthrodesis, AOFAS Score.

Ankle fractures are considered as one of the most common fractures treated in the hospital. The overall estimated incidence of ankle fractures is approximately 100 fractures per 105 person-years^{1,2}. This rate has constantly been increasing in both active young patients and in the elderly over past several decades³.

We face a lot of cases of old, undiagnosed, neglected ankle injuries in our hospital.

Our goal is to achieve satisfactory functional recovery after judicious management of old neglected ankle injuries considering its various limitations and complications.

Our objectives are to attain painless, stable, mobile ankle joint, to attain the acceptable appearance of foot and ankle and to attain long-lasting functional improvement.

MATERIALS AND METHODS

This study was conducted in the department of orthopaedics, Institute of Post Graduate Medical Education

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& Research and SSKM Hospital, Kolkata-700020, from December 2011 to October 2013. In this prospective randomized study, 30 patients were taken into consideration. All the patients were followed up for at least 6 months (6 to 18 months).

We operated on the patients of old (>3 weeks) ankle injuries with pain, functional disability and deformity and assessed the AOFAS score at presentation.

The patients' age, sex, occupation, mode of injury, type of injury were taken into consideration. The average age of our study population was 34.03 years. The majority was male 22(73.33%), and 8(26.67%) were female. We have included the cases of age more than 18 years, ankle injury of more than 3 weeks duration, closed injuries and patient medically stable for the operative procedure. We have excluded the cases of open injuries of ankle, patients suffering from neuropathy, medically debilitated patients, patients with uncontrolled Diabetes mellitus and patients with peripheral vascular disease.

After a detailed history and thorough clinical examination, radiographs were taken in AP, Lateral and Mortise view showing the ankle and injury is classified using Danis Weber classification.

This system classifies ankle fractures into three groups, A, B, and C, on the basis of the level of the fibula fracture in relation to the tibial plafond⁴.

Then all the patients are assessed by AOFAS (American

Orthopaedic Foot and Ankle Society's ankle-hindfoot scale) score and were recorded.

Then Pre-operative anaesthetic assessment and counselling of the patients regarding procedure, advantages, disadvantages, complications and prognosis were done and put for operation. Pre-operative antibiotics (Inj. Cefuroxime 1.5 gm and Inj. Amikacin 500 mg) were given IV, 12 hours before operation, during operation and post operative 5 days and then shifted to oral Cefuroxime 500 mg for 5 days more.

ANALYSIS AND RESULTS

This study was conducted in the department of orthopaedics, Institute of Postgraduate Medical Education & Research and SSKM Hospital, Kolkata-700020, from December 2011 to October 2013. In this prospective randomized study, 30 patients were taken into consideration. Among them 22(73.33%) were male and 8(26.67%) were female. All the patients were followed up at least 6 months. We operated on the patients of old (≥ 3 weeks) ankle injuries with pain and functional disability (American Orthopaedic Foot and Ankle Society's (AOFAS) Ankle-hindfoot Scale >60) who had significant trauma predisposing to the fracture.

The average age of affected males was 34.68 years and females were 32.25 years. The male: female ratio was 2.75: 1.

Most common injuries are WEBER Type B fractures (56.67%) followed by WEBER Type C (26.67%) and WEBER Type A (16.67%).

Most of the cases (60%) were operated within 3-6 weeks. Only 4 cases were operated after 10 weeks. Most of the cases (27 cases, 90%) osteosynthesis was done and in only 3 cases (10%) ankle arthrodesis was done. More than half of the patients (17,56.67%) were followed up for 13-18 months, 40% patients were followed up for 7-12 months and only one patient was followed up for 6 months. We faced complications like infection in three cases and skin loss in two cases which needed plastic surgery. At presentation the average AOFAS Score was 27.73, at 3 month postoperative it was 67.63 and at 6 months post op the score average was 83.33.

DISCUSSION

In our study, we selected our patients by preoperative evaluation including history, clinical examination and radiographs of the affected portion. Injury is classified according to WEBER's classification and evaluation of AOFAS score was done preoperatively.

In our series, 30 patients were operated, followed up and their results were evaluated. There was male predominance (68% male, 32% female). Male female ratio was 2.75: 1. Average age at operation was 34.03 year (21-55 years). Edward Yang *et al*, in a study in 2011 had taken 43 patients with supination-external rotation injury of ankle. Out of 43, 23 were male and 20 were female and the average age was 42 years⁶. Maged M Mostafa *et al* had studied on surgical management of neglected fracture dislocation of

ankle. In their study out of 16 patients 14 were men and 2 were women and average age was 40 years⁷.

In our series, 17 patients had WEBER Type B injury (56.67%) followed by WEBER Type C (26.67%) and WEBER Type A (16.67%). In another study by Maged M Mostafa, MD and Hasan M Ali, MD in Egypt out of 16 patients, 8 had type B, 2 had type A, 6 had type C injuries⁷. So, the injury pattern observed in our study is comparable to their study.

Most of the patients (60%) presented within 3 to 6 weeks of injury, 26.67% presented within 6 to 10 weeks of injury and only 4 patients presented after 10 weeks of injury. Average delay in the presentation was 1.71 months. In a study by Maged M Mostafa, MD and Hasan M Ali, MD the average delay in the presentation was 2.2 months⁷.

In our series, we preferred osteosynthesis as the operation of choice to restore the normal ankle anatomy and function. In 90% patients were treated with osteosynthesis. Fibula was fixed with 1/3rd tubular plate or recon plate and screws. In one case, both the malleoli fixed with TBW. Medial malleolus was fixed with 4 mm cannulated cancellous screw (Figs A-F) (20 cases) or tension band wiring (7 cases). In another case one syndesmotom screw is used along with both malleoli fixation. 3 patients in our study had severe osteoarthritic changes in bones around ankle joint due to malunited bimalleolar fracture with talar tilt preoperatively. So, we chose Ankle Arthrodesis in those cases using Calandruccio clamps (Figs G-L).

Kaj TA Lambers *et al* had done a study in 2013 on long term outcome of pronation external rotation ankle fractures treated with syndesmotom screws and arthrodesis. Out of 50 patients, they had done ORIF in 48 patients and arthrodesis in 2 patients who had severe arthritic changes⁸. In another study done by B S Narayana Gowda *et al* 15 patients were taken into consideration with post traumatic arthritis. They had opted Charnley's Compression Device for arthrodesis⁹.

In our study, more than half patients (56.67%) were followed up for 13 to 18 months, 40% for 7 to 12 months and only one female patient was followed up for 6 months. Average period for follow up was 12.73 months. In other studies in this field in different parts of the world follow up period were longer. Maged M Mostafa, MD and Hasan M Ali, MD had done a study in Assiut University, Assiut, Egypt in 2011 and average follow up period was 5.5 years. B S Narayana Gowda, J Mohan Kumar *et al*; had done a study in 2012 on outcome of ankle arthrodesis in post traumatic arthritis and the average follow up period was 1-5.7 years. Because of the short span of the study our follow up period is less. A longer follow up is necessary.

In our series, 5 patients (3 male 2 female) had post operative complications of which 3 patients (10%) had infection and 2 patients had post operative skin loss over operative area. Infections were treated with IV broad

Case 1



Fig A & B — Pre-operative clinical picture showing marked deformity



Fig E — 6 Month Postoperative X-ray of ankle AP & Lateral view (Fracture united)



Fig C & D — Pre-operative X-RAY of ankle AP & lateral view



Fig F — Postoperative clinical photograph showing correction of the deformity

spectrum antibiotics and regular dressing. Skin loss was managed by Split Thickness Skin Grafting. We observed that skin loss occurred in patients of older age group. No other complications like non-union, neurovascular injury, DVT, implant failure were occurred in our study.

All the patients were evaluated with AOFAS score pre operatively and at 3 months interval postoperatively. At presentation, average score was 27.73 which was improved post operatively. Average 3 months follow up score was 67.73 & average 6 month follow up score was 83.33. At presentation all patients having AOFAS score below 60. Among them 13 had score below 30 & 17 had score 30-60. At 3 month follow up only 3 patients had score below 60. Among them 2 patients had post- op complication like skin loss. Rest 27 patients had score between 60-80. At 6 months interval 23 patients (76.67%) had score above 80 and only 7 patients (33.33%) had score between 60-80. Among them 5 patients had post op complications. Our results are comparable with other studies done by B S Narayana Gowda, *et al*⁹; EM Van Schie-Van der Weert *et al*¹¹; Jung Ho Noh *et al*¹².

The authors of AOFAS scale preferred not to correlate numeric values to Excellent, Good, Fair & Poor because they cannot identify which criterion was used for providing the overall grade, and these names could give rise to confused results¹³.

So, results were not categorized as excellent, good, fair & poor. But we could have an idea about the improvement of scores which was indicative of functional improvement of patients.

The limitation of our study is that we don't have a large patient number and a long follow up. The study would have been more analysing, if we could have compared it with other modes of management. In our study, we concentrate on old bony injuries only but soft tissue injuries are not evaluated thoroughly.

Improvement of pain & functional capabilities that were found at 3 months were improved at 18 months (max F/U) which is comparable with other workers' experience. Most studies done in this topic had used AOFAS score to assess result like we did.

CONCLUSION

In Indian scenario, it is not uncommon to see patients treated conservatively or even left untreated and presented with displaced ankle fractures several weeks after injury.

In our study, we have seen that osteosynthesis is the mainstay of treatment because correction of malalignment lead to a better stance, better muscle balance and gradual correction of any foot deformities.

Ankle arthrodesis is preferred as the primary procedure if extensive arthritic changes are present or there is

Case 2



Fig G — Pre-operative clinical photograph



Fig H — Pre-operative X-Ray showing TYPE B # (WEBER) with severe OA



Fig I — Calandruccio clamp



Fig J — Postoperative photograph of ankle arthrodesis



Fig K — Postoperative X-Ray



Fig L — 6 month follow-up.

associated old unreduced dislocations or if extensive corrective surgery will be required.

At the longest followup (18 months), patients were generally doing well with most experiencing little or mild pain & few restrictions in functional activities. They had a significant improvement in function over time. It is important to counsel patients & their families regarding their expected functional recovery after an ankle injury.

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