



TRIMALLEOLAR FRACTURE DISLOCATION OF ANKLE – A CASE REPORT

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ABSTRACT

Ankle fracture is a very common type of fracture frequently encountered in orthopaedic practice.¹ Most ankle fractures are isolated malleolar fracture, accounting for two-thirds of fracture, with bimalleolar fractures occurring in one fourth of patients and trimalleolar fracture occurring in remaining 5-10% cases.² Trimalleolar fracture involves fracture of medial malleolus, fibula and posterior lip of articular surface of tibia associated with subluxation or dislocation of tibiotalar joint.³ Main aim of treatment of ankle fractures is anatomical ankle joint restoration and in majority of the cases it is achieved by open reduction and internal fixation.³ Trimalleolar fracture require open reduction more often than any other type of ankle fracture.³ The result of treatment of trimalleolar ankle fracture-dislocation usually are not as good as the results obtained for bimalleolar fracture.³ We report a case of primary open reduction and internal fixation of type 3A open trimalleolar ankle fracture-dislocation in 42 year old patient with excellent outcome in terms of function and fracture union .

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INTRODUCTION

Ankle fractures are among the most common injuries treated by orthopaedic surgeons. Management of these fractures depends on careful identification of the extent of bony injury as well as soft tissue and ligamentous damage.^{4,5,6} The key to successful outcome following rotational ankle fracture is anatomic restoration and healing of the ankle mortise.^{8,9,10} The management options based on the classification systems of Lague-Hansen,¹¹ whose sentinel work on the mechanistic classification of these injuries remains the standard more than 50 years later, and the AO-Orthopaedic Trauma Association (OTA) system based on the work of Weber and Danis.^{12,13} The vast majority of ankle fractures are sustained via a rotational mechanism. Patients presenting with ankle pain will in general provide a history of trauma. The mechanism of injury is often as benign and low-energy as an awkward step off a curb but may also be associated with a high-energy motor vehicle accident. No matter what the mechanism of injury, a consistent and through history and physical examination is required to fully characterize the injury and develop a treatment algorithm. The majority of ankle fractures can be diagnosed on plain radiographs using the AP, lateral, and mortise views. Most ankle fractures are isolated malleolar fracture, accounting for two-thirds of fracture, with bimalleolar fractures occurring in one fourth of patients and trimalleolar fracture occurring in remaining 5-10% cases.²

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Trimalleolar fracture involves fracture of medial malleolus, fibula and posterior lip of articular surface of tibia associated with subluxation or dislocation of tibiotalar joint.³ Main aim of treatment of ankle fractures is anatomical ankle joint restoration and in majority of the cases it is achieved by open reduction and internal fixation. Trimalleolar fracture require open reduction more often than any other type of ankle fracture.

Case Report

A 42 year old male presented to the emergency department six hours after a road traffic accident with pain, swelling and open wound over the left ankle. The distal end of tibia and fibula were exposed. On clinical examination the diagnosis of Gustilo-Anderson's Type III A ankle fracture dislocation was made. In the emergency room the dislocation was reduced, thorough wash was given and ankle was temporarily splinted and radiographs of the ankle in antero-posterior, lateral and mortise views were taken. Radiological diagnosis of trimalleolar fracture of right ankle of was made where there was a comminuted lateral malleoli fracture at the level of syndesmosis, vertical shear fracture of medial malleoli fracture and posterior malleoli fracture involving about 10% of the articulating surface.

Patient was hemodynamically stabilized and was planned to be taken up for emergency wound debridement and external fixator application OR open reduction and internal fixation of medial and lateral malleolus with plates and screws depending upon the intra operative soft tissue condition. After clearance from anesthesia team patient was taken up for surgery.

Patient was positioned supine after spinal anesthesia with pneumatic tourniquet in-situ. Ankle and foot were painted and draped. Debridement of ankle wound done and washed with normal saline, hydrogen peroxide and chlorhexidine. As there was minimum contamination and good soft tissue coverage with minimum skin loss; intra-operatively the decision for open reduction and primary fixation was made. Posterio-lateral approach through the open wound was used for the fibula first exposing the fracture site and fixing the fibula with 7 holed semi-tubular plate (3.5mm) and screws. Medial malleolus exposed with medial incision and fracture site exposed and reduced with 7 holed semi-tubular plate (3.5mm). As the posterior malleoli fracture was very small fragment, it was decided not to fix it. Anatomical restoration of ankle joint and the plates placement confirmed under fluoroscopy. Incisions closed in layers and tourniquet deflated after compression dressing. Posterior below knee slab applied.

Patient was mobilized non-weight bearing for 6 weeks with below knee slab. After 6 weeks ankle mobilization was started and toe touch weight bearing was started. At 3 months full weight bearing was started and ankle mobilization was continued. At 6 months follow up radiology showed complete bony union with excellent restoration of articular congruity of ankle joint with near normal ankle range of movements. Clinically patient shows 85 score depicting excellent function of ankle joint according to scoring system of Kaikkonen *et al.*

Primary open reduction and internal fixation of type 3A trimalleolar ankle fracture-dislocation is not commonly done for the fear of wound complications and infection. In the present case we observed a successful functional and anatomical outcome of primary internal fixation. A thorough wound debridement with good skin condition at that level benefits from primary fixation and helps in early mobilization and better rehabilitation.

In the present case we see good range of ankle movements and the fracture union, so we consider the wound debridement as the most important step in management of such injuries. Anatomical reduction and fixation of lateral malleolus is important for achieving the length and ankle stability, which also simplifies the fixation of medial malleoli.



CONCLUSION

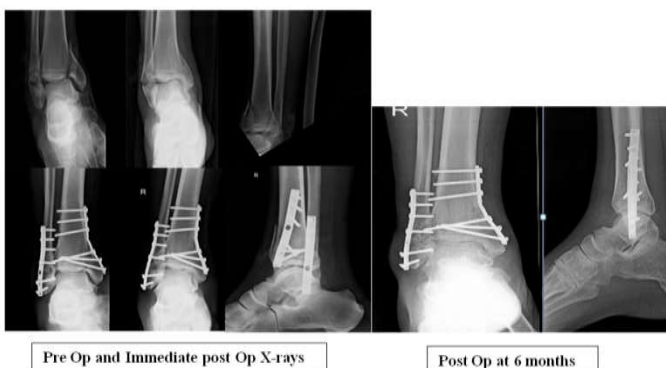
Primary open reduction and internal fixation of type 3A open ankle fractures shows excellent results in terms of bony union and return of function when there is good soft tissue coverage with minimal skin loss after a thoroughly done wound debridement. Otherwise ankle spanning external fixator is a best option till the soft tissues heal.

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A) Type 3A fracture dislocation of right ankle
B) Post-reduction in ER
C) Wound post-suture removal
D) Wound at 6 months
E) Medial Wound at 6 months



Pre Op and Immediate post Op X-rays

Post Op at 6 months

DISCUSSION

Ankle fractures are very common traumatic injury. The incidence of ankle fractures were reported to be 107 fractures per 100,000 persons per year.¹⁵ Koval *et al* reported 14.2 were trimalleolar fracture in the investigation into 33704 ankle fractures.¹⁶ Open trimalleolar fracture is usually treated with debridement and ankle spanning external fixator application.

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