

## Management and Clinical Outcome of Trimalleolar Fracture of Ankle: a case report

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**Objectives:** Ankle fractures are one of the most common lower limb fractures, where account for 9% of all fractures. Most ankle fractures are isolated malleolar fractures, while trimalleolar fractures occur in the remaining 7-11% cases. The trimalleolar fracture involves fracture of the medial malleolus, fibula and posterior lip of articular surface of the tibia, associated with subluxation or dislocation of tibiotalar joint and rupture of one or more ligaments. These fractures are commonly caused by a twisting mechanism. The management of the trimalleolar fracture is by open reduction and internal fixation due to its unstable position. The postoperative outcome is evaluated by using the American Orthopedics Foot and Ankle Society (AOFAS) scoring system.

**Case presentation:** A 38-year-old woman was admitted to the ER with chief complain a painful left ankle after a motor vehicle accident. She was previously riding a motorcycle, then stopped at the traffic light with left leg stepping on the road. Her left leg was hit from behind by a moving car. On the physical examination at the left ankle region, there was laceration with size 5x1x1cm at the anteromedial side. There was also swelling around the left ankle with no deformity. From the palpation, there was tenderness around the left ankle and a. dorsalis paedis was still palpable with capillary refill time < 2 seconds. We performed the ankle X-Ray which considered as a fracture of distal os. tibia and os. fibula. We diagnosed this patient as a closed fracture of the left ankle with a classification of Lauge-Hansen supination external rotation (SER) injury. We did an ORIF, and the patient has been doing rehabilitation for 12weeks. We evaluated the outcome by the AOFAS scoring system, resulting in 85out of 100.

**Results:** The incidence of ankle fractures is approximately 187 fractures per 100,000 people each year, where the percentage of trimalleolar fracture occurs in 7 to 11% cases. Many of stable fractures are reduced by conservative treatment and the other unstable displaced and open fractures require open reduction internal fixation. From anamnesis, physical examination and radiographic imaging, we diagnosed this patient as closed fracture of left ankle Lauge-Hansen supination external rotation (SER). SER injury is the most common occurring among Lauge-Hansen's categories, where firstly in the first stage the anterior inferior tibiofibular ligament (AITFL) was injured. Then in the second stage, an oblique/spiral fracture of the distal fibula occurred. With more force, the posterior inferior tibiofibular ligament (PITFL) was injured or the posterior malleolus was fractured in third stage. Finally, in fourth stage, the medial malleolus was fractured or the deltoid ligament was injured. We considered the fracture as unstable trimalleolar fracture, therefore we performed ORIF by using plate for lateral malleolus, wires for medial malleolus and screw for posterior malleolus. The patient was kept non-weight-bearing for a total of nine weeks postoperatively. We did a 3-months follow-up by clinical outcome and ankle X-Ray. The clinical outcome was measured by AOFAS scoring system and showed a good result which is 85/100. This result is in accordance with the previous study in 2014 which showed a quick recover of adults in activity limitation in the first 3 months following the fracture.

**Conclusion:** Trimalleolar fracture is a rare case which needs a challenging management to achieve the goal of reduced and stable fixation. Understanding the trauma mechanism is essential for good reduction and internal fixation. The concern of treatment and clinical outcome evaluation are needed to prevent complications, e.g. non-union, joint stiffness and secondary osteoarthritis.

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