

# Chapter 2

## Unimalleolar Fractures: Medial Malleolus Only

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### Case Presentation

This is a 40-year-old female who sustained closed injury to ankle following a twisting injury. She was brought to the emergency room for evaluation and underwent placement into a splint.

**Injury films** (Fig. 2.1) (AP, mortise, and lateral views) revealed an isolated fracture of the medial malleolus with a vertical fracture line indicating a supination adduction type of injury. Suspicion of an intra-articular step prompted us to perform a CT scan which confirmed our suspicion.

**Treatment and timing of surgery:** Surgery was planned on the sixth day after swelling subsided. Plan was to elevate the depressed fragment and apply an antilide plate over the medial malleolus.

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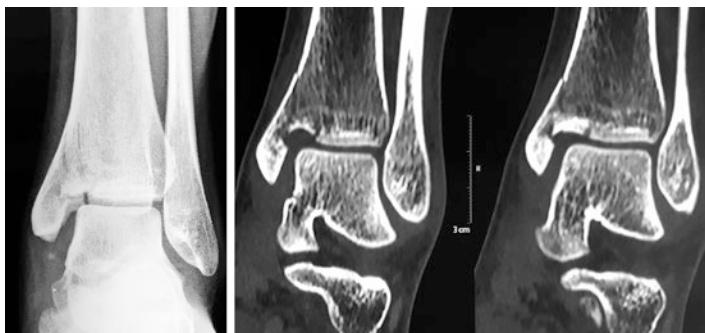


FIGURE 2.1 Anteroposterior X-ray post-injury and CT films showing intra-articular step

### *Surgical Tact*

**Position:** Supine position under spinal anesthesia.

**Approach:** A J-shaped incision curving anteriorly (Fig. 2.2) was used over the medial malleolus to gain access to the medial malleolus and the anteromedial corner of the tibial plafond.

**Fracture reduction and fixation:** A small-incision arthrotomy was done in the anteromedial part of the tibial plafond to allow a small curved mosquito forceps to be passed in to feel for the depressed fragment. The depressed fragment was elevated through the fracture site under fluoroscopic guidance and the fracture was reduced using a clamp. K-wires were used to provisionally hold the reduction. Reduction was confirmed on fluoroscopy and by feeling for the depressed fragment using a curved mosquito forceps. A T-plate was used in antiglide mode for fixation with the lower screws acting as raft screws subchondrally (Fig. 2.3).

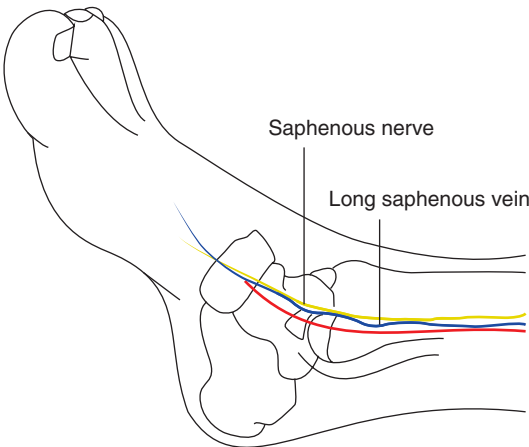


FIGURE 2.2 J-shaped skin incision curving anteriorly



FIGURE 2.3 Postoperative X-rays

### *Postoperative Plan*

A short leg splint was placed for 3 days for comfort and pain control. Range-of-motion exercises were started after 3 days. The patient remained non-weight bearing for 6 weeks after which partial weight bearing was started.

At 12 weeks, the patient was full weight bearing and had resumed household ambulation.

### *Outcome*

Follow-up radiographs at 12 weeks show healed fracture. She had residual swelling which took another 6 weeks to disappear completely. Patient returned to full function at 6 months with full ankle motion.

**Complications:** None. No plans for hardware removal.

### *Salient Points/Pearls*

- Herscovici in 2007 reported 57 isolated medial malleolus fractures and presented a classification system (Fig. 2.4). In his series, he obtained good results with conservative management of isolated medial malleolus fractures.

Four simple patterns have been described:

- A—Tip avulsions
- B—Intermediate fracture line
- C—Fracture at the level of the plafond
- D—Fracture above the level of plafond

The surgical management of a displaced medial malleolar fractures is often described in relation to its presentation as a part of bi- or tri-malleolar injuries. In such cases the recommendation is as follows:

**Type A fractures:** These are avulsion fractures of the anterior colliculus. Surgery must be aimed at fixation of the avulsed fragment. Generally the avulsed fragment is small

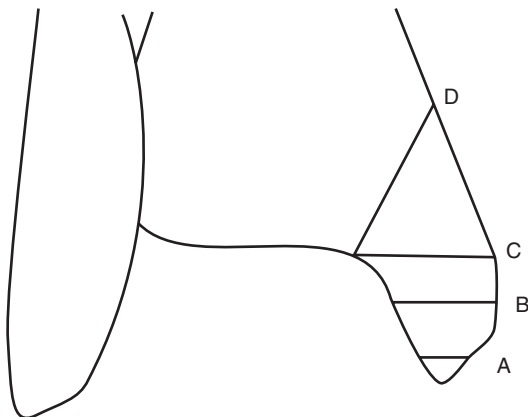


FIGURE 2.4 Classification of medial malleolar fractures

and needs to be fixed with two K-wires, supplemented with a tension band. After fixing the avulsed anterior colliculus, if there is displacement of the talus within the mortise indicating a rupture of the deep deltoid ligament, it should be repaired/reconstructed appropriately.

**Type B and C fractures:** These are avulsion injuries and should be fixed using compression screws (two if possible to prevent rotation) or tension band wiring depending on the size of fragment. Screws inserted posterior to the anterior colliculus place the posterior tibial tendon at significant risk for injury or abutment. Hence, the posterior tibial tendon should be directly visualized prior to the placement of screws in the medial malleolus when they are inserted posterior to the anterior colliculus.

**Type D fractures:** These fractures require accurate reduction of the plafond. If there is an impacted area it should be elevated. Bone graft can be used to fill in any void left after elevation. Fixation can be achieved by using cancellous lag screws perpendicular to the fracture site or by using antiglide plates.

- It is advisable to wait for the swelling to subside before operating on these fractures to reduce the chances of post-operative wound complications. It is also important to raise thick flaps.

- Care should be taken to avoid injury to the saphenous vein and nerve in the anterior aspect of the incision and the posterior tibial tendon in the distal aspect of the incision.
- Ankle range of motion should be started as soon as permissible to avoid postoperative ankle stiffness. Weight bearing is avoided till 6 weeks after surgery.

## Further Reading

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