CASE REPORT

Open Posterior Ankle Dislocation without Fracture and Its Management: A Case Report and Review of Literature

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Abstract

Background: Open ankle dislocation without associated fractures is one of the rare orthopedic injuries. Early reduction and stabilization is required to prevent neurovascular damage and further complications.

Case description: We present a case of 22-year-old male, who sustained injury to his right ankle after fall from height. On examination and X-ray evaluation, he had posterior open left ankle dislocation without any malleolar fractures. We managed with debridement, reduction of dislocation, and ankle stabilization by using ankle spanning external fixator. After the removal of the fixator, the patient is having painless ankle range of motions and bearing weight with no difficulty.

Conclusion: Although open ankle dislocations without fracture are rare injuries but early intervention is essential to prevent the complications, to salvage the foot and to get better functional outcome.

Clinical significance: Open ankle dislocation without fracture is rare entity; early reduction of dislocation with ankle stabilization and proper wound management helps in getting better functional outcome.

Keywords: External fixator, Open ankle dislocation, Trauma.

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Background

The ankle joint is a hinged synovial joint; this joint complex is formed by articulation of talus, tibia, and fibula bone. Ankle dislocation without fracture is a rare condition due to high strength of ligaments and soft tissue[1] compared to malleoli. Anteroposterior stability of ankle is provided mainly by ligaments, joint capsule, and ankle mortise formed by tibial plafond, medial, and lateral malleolus; all these factors strengthen the stability of the joint. These ankle injuries are high-energy injuries, most commonly associated with road accident, fall from height, and sports injury; however, few cases of low-energy injuries have been reported. We present a case of posterior open ankle dislocation, managed with external fixator.

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Case Description

A 22-year-old male came with complaints of pain, wound, and deformity in the right ankle after fall from height. On examination, there was a deformity at the ankle with wound measuring about 7 × 5 cm in the anterior aspect of right ankle, exposing the distal aspect of the tibia with tibial plafond, tarsals, and the dislocated tibiotalar and tibiofibular joints (Fig. 1). The whole foot was posteriorly displaced with presence of distal pedal pulses and no hypoesthesia over foot. There was no evidence of repeated ankle trauma or previous surgical procedure to the ankle present. Radiological investigation showed posterior dislocation of ankle without any associated fracture (Fig. 2). After initial resuscitation and stabilization protocols, the patient was immediately taken to the operating room for ankle reduction and stabilization. Under general anesthesia, ankle was reduced and the peripheral pulses were palpated to assess the postreduction neurovascular status. The wound was thoroughly debrided and adequate wound wash given with normal saline. Ankle was stabilized in dorsiflexion using an ankle spanning external fixator using four 4.5-mm Schanz pin in tibia and single

Fig. 1: Ankle dislocation, wound exposing the tibial plafond and deformity

calcaneal pin (Figs 3 and 4). Joint stability was confirmed with the help of fluoroscopic examination. Lateral collateral ligament and joint capsule were repaired and no tendon injury was noted. Adequate postoperative analgesia was given for pain management. Limb elevation and ice packing were given to prevent the edema. Intravenous antibiotic was given to prevent infection. Daily dressing was done under local anesthesia to enhance granulation (Fig. 5). After 1 week, when the wound became healthy, skin grafting was done (Fig. 6). The patient was mobilized with the help of walking aid and strict nil weight bearing on the affected limb for 1 week. He was discharged on postoperative day 10.

On 2nd week follow-up, the patient was advised full weight bearing; at 6th weeks, the external fixator was removed (Figs 7 and 8) and ankle range of motion exercises were started under the observation of a physiotherapist. The patient was advised regular monthly follow-up for the next 3 months.

Discussion

Ankle dislocations without concomitant malleolus fracture are called pure ankle dislocations. It is one of the rare orthopedic conditions among ankle injuries.[2] The predisposing conditions for ankle dislocation are malleolar hypoplasia, weakness in peroneal muscle, ligament laxity, etc.[3] Ankle position at a time of trauma also influences the peculiarity of this injury.

The estimated incidence is 0.065% of all ankle injury. Peraire published the first case of isolated ankle dislocation without fracture in 1913.[4] Fahey and Murphy categorized talotibial dislocation into five types on the basis of direction of dislocation by the location of most distal bone segment (talus) as anterior, posterior, medial, lateral, and superior or combined dislocation.[5] The most common injury pattern is posterior type, which occurs when the ankle is extremely plantar flexed with simultaneous axial load and forced inversion of foot. The above mechanism allows anterior extrusion of talus through mortise by rupture of anterior talofibular and calcaneofibular ligaments, leading to posterior medial dislocation.[1]

The primary goal of treatment is immediate reduction and debridement of wound with bony stabilization. Early intervention reduces the risk of neurovascular complication. Open wound required debridement and adequate wash to prevent infection.[6]

Fig. 2: X-ray ankle (lateral view) showing the posterior ankle dislocation without any fracture

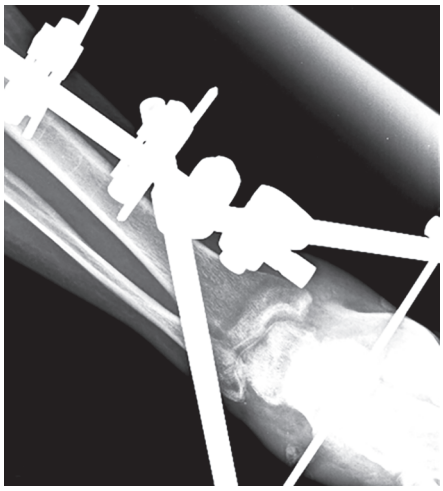

Fig. 3: Postoperative X-ray ankle after reduction and stabilization with external fixator (AP view)

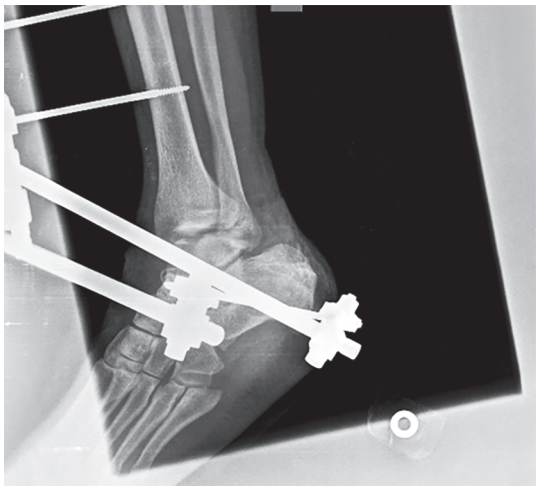

Fig. 4: Postoperative X-ray ankle after reduction and stabilization with external fixator (lateral view)

Fig. 5: Granulated wound over the ankle with external fixator *in situ*

Fig. 6: Complete healing of the wound after the skin grafting with external fixator *in situ*

Fig. 8: Clinical image of the patient showing the functional outcome

In our cases, we reduced the ankle after relaxing calf muscles and postreduction distal pulsation was checked to rule out postreduction vascular compromise. Bony stabilization was done with an ankle spanning external fixator and proper debridement and wound wash was given. Time of repair of lateral ligaments is controversial; some authors recommend treatment after debridement.[7,8] We did lateral ligament and capsule repair to obtain good outcome. After good granulation, the wound was covered with full-thickness skin grafting. Younger age patients, early reduction of dislocation, and the absence of neurovascular injury provide better outcome as compared to old patients, delayed reduction, and vascular injury, which negatively impact the prognosis of the patient. The major complications are wound infection, neurovascular compromise, ankle stiffness, etc. Our patient recovered well with full range of ankle motion without pain and discomfort.[8,9]

Conclusion

Although open ankle dislocations without fracture are rare injuries but early intervention is essential to prevent the complications, to salvage the foot and to get better functional outcome.

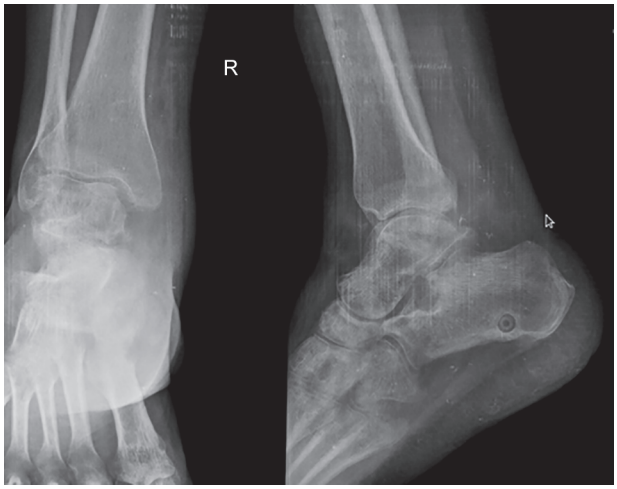

Fig. 7: X-ray ankle AP and lateral views after the external fixator removal, showing the congruent ankle joint

Clinical Significance

Open ankle dislocation without fracture is a rare entity; early reduction of dislocation with ankle stabilization and proper wound management help in getting better functional outcome.

Consent Statement

A written informed consent was obtained from the patient for publication of this article.

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