

DIVERGENT FRACTURE-DISLOCATION OF THE ANKLE: A CASE REPORT AND LITERATURE REVIEW

Abdel Amar Adam Bababody*, R. Badaoui, M. Boussaidane, Y. Benyas, J. Boukhriss, D. Benchebba and B. Chafry

India.



*Corresponding Author: Abdel Amar Adam Bababody

India.

Article Received on 29/01/2024

Article Revised on 19/02/2024

Article Accepted on 09/03/2024

ABSTRACT

A divergent fracture dislocation of the ankle is a rare injury secondary to a high-energy accident with axial forces dislocating the talus in the tibio peroneal mortise accompanied by syndesmosis injury. It is most often associated with a fracture of the fibula. We report one case, its mechanism, management, short-term outcomes and the review of literature.

KEYWORDS: Ankle, Fracture, Dislocation, Syndesmosis.

INTRODUCTION

The ankle fracture-dislocation is common in trauma. The posterior and internal varieties are the most common types. Divergent tibio talar fracture-dislocation is an exceptional pathological variety; a few similar cases have been published and reported in the literature.

following a road accident. He was the victim of a fall from a bicycle with his right foot stuck in forced inversion, causing closed trauma to the right ankle. Clinically, the right ankle was deformed with protrusion of the internal malleolus, slight edema, without skin lesion or opening, or neurovascular deficit (Fig1).

CASE REPORT

A 18-year-old man, with no particular surgical medical history or defects, was admitted to the emergency room



Fig. 1: ankle deformation.

The radiographs showed a dislocation of the upper ankle joint with an intact tibia and a supra-syndesmotomic fibular

fracture (Fig2).



Fig. 2: Radiographs showing a central and superior dislocation of the ankle joint with an intact tibia and a suprasyndesmotomic fibular fracture.

An emergency reduction by external maneuver was successfully carried out (Fig3)



Fig. 3: X-ray of the ankle immediately after reduction.

The patient was sent to the operating room for fibula osteosynthesis using a third tubular plate associated with a 3.5 mm syndesmotomic cortical screw passing through the plate (Fig4).



Fig. 4: Postoperative x-ray.

Intraoperative fluoroscopy after fixation of fibula showed increased medial joint space between the medial malleolus and the talus indicating a rupture of the deltoid ligament, that was repaired by absorbable sutures, ankle and foot in slight plantarflexion and inversion. The immobilization was carried out by a plaster boot.

Syndesmotomic screw and plaster were removed at six weeks. The patient underwent rehabilitation for 2 months and achieved almost normal ankle mobility. At 6 months post injury he had a pain free and returned to his previous work.

DISCUSSION

Ankle dislocation without associated fracture is a rare injury. Around thirty cases have been reported in the literature since 1913.^[1] These injuries usually result from high-energy trauma. Fahey and Murphy^[2] classified ankle fracture dislocations into five types: anterior, posterior, medial, lateral, superior (diverging), or any combination of these directions.

Posterior and internal ankle dislocations are the most common.^[3] Superior or divergent tibiotalar dislocations are rare, they can occur with or without associated fracture.^[4] The mechanism of these injuries generally results from axial force of the foot in plantar flexion and inversion as demonstrated by Fernandez^[5] in cadaveric studies. There is a sequential rupture of the anterolateral joint capsule, the anterior talofibular ligament, the calcaneofibular ligament followed by a syndesmotomic lesion. Edwards and DeLee^[6] proposed a classification of distal tibiofibular diastasis without fracture. They identified four types of frank diastasis of the ankle: type I lesions consisting of one side of the distal fibula and subluxation without plastic deformation of the fibula; type II characterized by lateral subluxation of the distal fibula with plastic deformation. Type III is a posterior rotatory subluxation of the fibula; type IV is the superior

dislocation of the talus between the tibia and the fibula, leading to a major diastasis.

Diagnosis can be difficult in an obese patient, or in cases of significant swelling. Neurovascular status should be assessed by palpation of the dorsal foot and posterior tibial pins and if necessary by computed tomography angiography. Neurovascular injuries have been reported in approximately 10% of cases of ankle dislocations.

In terms of treatment, it is necessary to perform early reduction to relieve pressure on the soft tissues and neurovascular structures, under general or even local anesthesia. Closed injuries, treated by closed reduction, can be operated on within 6 to 12 hours, restoring the fibular length by osteosynthesis and repairing the ligamentous structures to stabilize the anatomical reduction. In most cases, reduction of the fibular fracture reduces the talus. Osteochondral lesions lead to poor clinical outcomes despite anatomical reduction and stable fixation; they are more common in cases of high-energy trauma. Intraoperative exploration of the dome of the talus should be performed when osteochondral damage is suspected.^[7] Furthermore, some authors such as Mourgues^[8] recommend temporary locking of the tibiotalar joint with a Steinman nail, however complications such as arthritis have been reported. The others fixed the syndesmosis with a screw for six weeks.

The quality of recovery and a lower incidence of complications mainly depend on the treatment. After surgery, the patient is kept weight-bearing, usually in a plaster boot, for 6 to 12 weeks until healing of the fracture is visible on follow-up radiographs.^[9] Physical therapy and range-of-motion exercises help restore joint flexibility. The treatment results are good in most cases. Certain elements have a poor prognosis^[10] such as a delay in treatment, a rupture of the anterior tibial artery, ligamentous lesions at the bottom of the peroneal ankle, and especially lesions of the integument with the appearance of necrotic areas which present a risk of 'arthritis. Minimally invasive surgical techniques and external fixation are used in these cases.

For long-term results, the decline in the series is often less than one year. A few studies have specifically investigated the long-term consequences of ankle dislocation and fracture injuries, with series results often being less than one year. Lindsjo *et al*^[11] reported the longest results between 2 years and 6 years postoperatively, concerning a series of 306 ankle fracture dislocations.

CONCLUSION

Divergent fracture-dislocations of the ankle are rare injuries. They generally occur during a violent traumatic accident. The quality of the results depends on the immediate reduction of the ankle and the preservation of the neurovascular state which are essential for a better prognosis for the patients. Closed fracture dislocations

often have a good prognosis, however, open fracture dislocations can be extremely serious.

REFERENCES

1. Joseph LD, John BD, Valérie B DPM. Ankle dislocation without fracture in a young athlète. *The Journal of Foot and Ankle Surgery*, 1998; 37: 334-338.
2. Fahey JJ, Murphy JL. Dislocations and fractures of the talus. *Surg Clin North Am.*, 1965; 45: 79-102.
3. Agawal AC, Raza HKT, Hag RU. Closed posterior dislocation of the ankle without fracture. *Indian J Orthop*, 2008; 42: 360-362.
4. Lamraski G, Clegg E. Unusual upward closed tibiotalar dislocation without fracture: a case report. *J Foot Ankle Surg*, 2010; 16: e44-46.
5. T.J. Fernandes. The mechanism of talo-tibial dislocation without fracture. *J Bone Joint Surg*, 1976; 58B: 364-365.
6. G.S. Edwards, J.C. DeLee. Ankle diastasis without Fracture. *Foot Ankle*, 1984; 4: 305-312.
7. Sorrento DL, Mlodzienski A. Incidence of latéral talar dôme lésions in SER IV ankle fractures. *J Foot Ankle Surg.*, 2000; 39: 354-358.
8. G. Mourgues De, J. Comtet, F. Leclerc-Chalvet. La luxation tibio-tarsienne pure sans fracture associée. *Revue de la littérature à propos d'un cas. Lyon Chir*, 1969; 65: 661-667.
9. S. Elise, C. Maynou, H. Mestdagh, P. Forgeois, P. Labourdette. Simple tibiotalar luxation. Report on 16 cases. *Acta Orthop Belg*, 1998; 64: 25-34.
10. S. Olerud. Subluxation of the ankle without fracture of the fibula. A case report. *J. Bone Joint Surg*, 1971; 53A: 594-596.
11. Lindsjo U. Operative treatment of ankle fracture-dislocations: a followup-study of 306/321 consecutive cases. *Clinic Ortho RelRes.*, 1985; 199: 28-38.