

Divergent Fracture-Dislocation of the Ankle- About 2 Cases

Youness Mokhchani^{1,3*}, Abderrahim Zaizi^{1,3}, Youssef Zorkani^{2,3}, Bouchaib Chafry^{1,3}, Ahmed Salim Bouabid^{1,3}, Mustapha Boussouga^{1,3}

¹Department Of Orthopedic Surgery And Traumatology II, Mohammed V Military Teaching Hospital

²Department Of Psychiatry, Moulay Ismail Military Hospital

³Faculty Of Medicine And Pharmacy - Mohammed V University -Rabat- 10000, Morocco

*Corresponding author: Youness Mokhchani

| Received: 20.05.2019 | Accepted: 05.06.2019 | Published: 19.06.2019

DOI: [10.36347/sjams.2019.v07i06.020](https://doi.org/10.36347/sjams.2019.v07i06.020)

Abstract

Case Report

Divergent fracture-dislocation of the ankle is a rare injury; it is due to a high-energy accident with axial forces that dislocate the astragalus at the tibiofibular junction with injury of the syndesmosis. It is most often associated with a fracture of the fibula, and sometimes with a fracture of both the fibula and tibia. We report 2 cases, their mechanisms, their treatments, their short-term results and review of the literature.

Keywords: Ankle, fracture dislocation, syndesmosis, divergent.

Copyright © 2019: This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

INTRODUCTION

The ankle is a joint that links the tibia, the fibula, and talus (astragalus) all together. The fracture-dislocation of the ankle is a fracture combined with the loss of the area made of the articulating joint surfaces belonging to the three bones composing the joint. It is a frequent traumatic injury. Posterior and internal varieties are the most common. The divergent tibiotalar dislocation is an exceptional pathological variety; some similar cases have been published and reported in the literature. Vascular or nerve damage can occur during a fracture dislocation of the ankle. Talus necrosis is also a possible complication.

OBSERVATION

First case

A 40 year-old man was admitted to the emergency department after falling down the stairs of his house, the impact point was on his right ankle. Clinically, the right ankle was deformed, with a slight oedema, a skin abrasion without opening or vascular or nervous deficiencies (Fig1). X-rays showed a divergent dislocation of the ankle and a supraligamentary fibular fracture, whereas the tibia was intact (fig 2).

An urgent external reduction was successfully achieved, followed by the osteosynthesis of the fibula using a one third tubular plate associated with a 3.5 mm syndesmotomic cortical screw that was inserted through one of the plate's holes (fig3).

The peroperative fluoroscopy after fibula fixation showed a widening of the medial joint space between the medial malleolus and the talus, indicating a rupture of the deltoid ligament, which was sutured using an absorbable stitch (ankle and foot in slight plantar flexion and inversion).

After two months of motor rehabilitation, the patient regained a near normal ankle mobility. Six months after the injury, all pain was gone and the patient finally went back to his previous job.

Second case

A 49-year-old man with no particular history was victim of a sports injury during a football game; he had a closed right ankle trauma (direct contact with another opponent) causing total pain and functional impotence of the right ankle. Orthopedic examination finds a deformed ankle without oedema or skin opening. No evidence of neither vascular nor nervous damages was found. An X-ray of the right ankle was performed; it showed a supraligamentary bi-malleolar fracture with a divergent dislocation of the ankle (fig4). An emergency reduction was carried out under sedation, and then the patient was admitted to the operating room. Osteosynthesis of both the lateral and the medial malleolar was achieved; we used a third tubular screwed plate (6 holes) for the former and a pin screw for the latter. And finally we proceeded to the installation of a syndesmotomic screw and the repair of the deltoid ligament. The brightness amplifier control was

satisfactory (fig5). The plastered immobilization was left in place for 6 weeks before removing the plaster and syndesmotic screw. The patient received functional

rehabilitation for 2 months until normal mobility was resumed.



Fig-1: clinical aspect of the ankle



Fig-2: Ankle X rays of the first case showing a divergent dislocation of the ankle and a supraligamentary fibular fracture



Fig-3: Postoperatif X rays showing osteosynthesis of the fibula with syndesmotic screw



Fig-4: Ankle X rays of the second case showing a supraligamentary bi-malleolar fracture with a divergent dislocation of the ankle

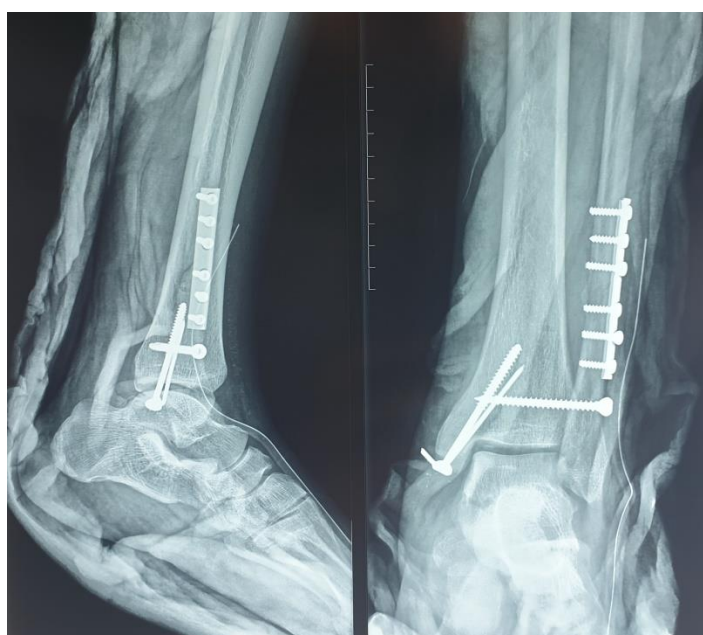


Fig-5: Postoperatif X rays showing osteosynthesis of the fibula and medial malleolus associated to the syndesmotic screw

DISCUSSION

Ankle dislocation without associated fracture is a rare lesion. Approximately 30 cases have been reported in the literature since 1913 [1]. These injuries are usually the result of a high-energy trauma. Fahey and Murphy [2] have classified ankle fracture-dislocations into five types: anterior, posterior, medial, lateral, upper (divergent) or any combination of these directions. Posterior and internal dislocations of the ankle are the most frequent [3]. Upper or divergent tibiotalar dislocations are rare, they may occur with or without associated fractures [4]. The mechanism of these injuries usually results from the axial force of the foot in plantar flexion and inversion, as Fernandez [5] demonstrated in cadaveric studies. There is a sequential rupture of the anterolateral joint capsule, the anterior talofibular ligament, the calcaneo-fibular ligament followed by a syndesmotic injury. Diagnosis may be difficult in obese patients or in the case of significant

swelling. Nervous and vascular states should be assessed by the palpation of both the dorsalis pedis and the posterior tibial pulses, and if necessary, by angiography and CT scans. Nervous and vascular lesions were reported in about 10% of all ankle dislocation cases. Concerning the treatment, early reduction (under general or even local anesthesia) is necessary to relieve the pressure on soft tissues and neurovascular structures. Closed wounds treated by closed reduction can be operated on within 6 to 12 hours, restoring the length of fibula by osteosynthesis and repairing ligament structures to stabilize the anatomical reduction. In most cases, the reduction of the fibular fracture reduces the dislocation. Osteochondral damage leads to poor clinical outcomes despite a good anatomical reduction and a stable fixation. They're more common in high-energy trauma. Peroperative exploration of the talar dome should be carried out in case of suspicion of osteochondral lesions

[6]. In addition, some authors such as Mourgues [7] recommend the temporary locking of the Tibiotalar joint with a Steinman pin. However, this can lead to complications such as arthritis. Others use a syndesmotic screw for six weeks. After the operation, the patient is kept without support, usually immobilized by a plaster boot for 6 to 12 weeks until rupture healing is seen on X-rays [8]. Physiotherapy and joint amplitude exercises help restore the joint flexibility. Treatment outcomes are good in most cases, but in some cases the prognosis is poor [9], such as late treatment; rupture of the anterior tibial artery and in particular skin lesions that increase the risk of arthritis. Mini-invasive surgical techniques and external fixation are used in these cases. Some studies have specifically studied the long term results of lesions caused by fracture-dislocations of the ankle, the results of the series were often less than one year. Lindsjo *et al.* [10] reported the longest results, which followed the progression of the patient's conditions up to six years after the operation that included a series of 306 cases of fractured-dislocated ankle.

CONCLUSION

Divergent fracture-dislocations of the ankle are rare injuries. They usually occur in a violent traumatic accident. Immediate ankle reduction and preservation of both nervous and vascular status are important for successful patient management. Closed fracture-dislocations often have a good prognosis; however, open fracture-dislocations can be extremely severe due to the major infectious risk.

REFERENCES

1. Larsen J, Burzotta J, Brunetti V. Ankle dislocation without fracture in a young athlete. *The Journal of foot and ankle surgery*. 1998 Jul 1;37(4):334-8.
2. Fahey JJ, Murphy JL. Dislocations and fractures of the talus. *Surg Clin North Am*. 1965;45:79-102.
3. Agrawal AC, Raza HK, Haq RU. Closed posterior dislocation of the ankle without fracture. *Indian journal of orthopaedics*. 2008 Jul;42(3):360.
4. Lamraski G, Clegg E. Unusual upward closed tibiotalar dislocation without fracture: a case report. *Foot and ankle surgery*. 2010 Jun 1;16(2):e44-6.
5. J. Bone Joint Surg. 1976; 58: 364-5. Fernandes TJ. The mechanism of talo-tibial dislocation without fracture.
6. Sorrento DL, Mlodzienski A. Incidence of lateral talar dome lesions in SER IV ankle fractures. *The Journal of foot and ankle surgery*. 2000 Nov 1;39(6):354-8.
7. De Mourgues G, Comtet JJ, Leclerc-Chalvet F. La luxation tibiotarsienne pure sans fracture associée. *Revue de la littérature à propos d'un cas*. *Lyon Chir*. 1969;65(5):661-7.
8. Elisé S, Maynou C, Mestdagh H, Forgeois P, Labourdette P. Simple tibiotalar luxation. *Acta orthopaedica Belgica*. 1998 Mar;64(1):25-34.
9. Olerud S. Subluxation of the ankle without fracture of the fibula: a case report. *JBJS*. 1971 Apr 1;53(3):594-6.
10. Lindsjö UL. Operative treatment of ankle fracture-dislocations. A follow-up study of 306/321 consecutive cases. *Clinical orthopaedics and related research*. 1985 Oct(199):28-38.