

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

**FRACTURE LUXATION  
DIVERGENTE DE LA CHEVILLE: A  
PROPOS D'UN CAS ET REVUE DE  
LA LITTERATURE**

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**ABSTRACT:**

A divergent fracture-dislocation of the ankle is rare injury. It occurs when a high-energy axial force pushes the talus into the mortise, splits the syndesmosis. It is often associated with a fracture of the fibula. We report one case, its mechanism, management, short-term outcomes and the review of literature.

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**Keywords:** Ankle, Fracture; Dislocation; Syndesmosis.

**RESUME**

La fracture luxation divergente de la cheville est une lésion rare, elle est secondaire à un accident de haut énergie avec des forces axiales luxants l'astragale dans la mortaise tibio-péronière avec lésion de la syndesmose. Elle s'associe le plus souvent à une fracture du péroné.

Nous rapportons un cas, son mécanisme, sa prise en charge, ses résultats à court terme et revue de la littérature.

**MOTS CLES:** cheville, fracture, luxation, syndesmose.

**INTRODUCTION:**

The fracture-dislocation of the ankle is frequent in traumatology. Posterior and intern varieties are the most common types. The divergent tibio-talar fracture-dislocation is an exceptional pathological variety, a few similar cases have been published and reported in the literature.

**Case Report:**

A 46 years old male was admitted to the emergency department after falling down the stairs with an impact point at the right ankle. Clinically, the right ankle was deformed, slight edema, skin abrasion

without opening or neurovascular deficit (Fig1).

X-ray radiographies showed an upper dislocated ankle joint with an intact tibia and supra-syndesmotic fibular fracture (Fig2). An urgent reduction by external maneuver was successfully performed (Fig2), followed by osteosynthesis of the fibula using a third tubular plate associated with a syndesmotic 3.5-mm cortical screw through the plate (Fig3). 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.

Syndesmotic 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.



Fig 1: ankle deformation.



Fig 2: X-rays showing a central and upper dislocated ankle joint with an intact tibia and supra-syndesmotic fibular fracture.



Fig 3: X-ray of ankle immediately after reduction



Fig 4: Postoperative radiography

## **DISCUSSION**

Ankle dislocation without an associated fracture is a rare lesion. Approximately 30 cases have been reported in the literature since 1913 (1). These injuries typically result from high-energy trauma.

Fahey and Murphy (2) classified ankle fracture dislocations into five types: anterior, posterior, medial, lateral, upper (divergent), or any combination of these directions.

Posterior and intern ankle dislocations are most frequent (3). The upper or divergent tibiotalar dislocation are rare, it can occur with or without associated fracture (4). The mechanism for these injuries usually result from axial force foot in plantarflexion and inversion as has been demonstrated by Fernandez (5) in cadaveric studies. There is sequential rupture of the anterolateral joint capsule, anterior talofibular ligament, calcaneofibular ligament followed by syndesmotic injurie.

The diagnosis may be difficult in obese patient, or if there is major swelling. Neurovascular status should be evaluated by palpation of dorsalis pedis and posterior tibial pulses and if necessary using of CT angiography. Neurovascular injuries have been reported in approximately 10% of ankle dislocations cases.

As a treatment, it is necessary to carry out 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 operate within 6-12 hours, by restoring fibular length using osteosynthesis and repairing ligaments structures to stabilize the anatomic reduction. In most cases, reduction of the fibular fracture reduces the talus. Osteochondral damage leads to bad clinical outcomes despite anatomic reduction and stable fixation. it is more common with high-energy trauma. Intraoperative exploration of the talar dome must be performed when osteochondral damage is suspected (6). In addition, some authors such Mourgues (7) recommend temporarily locking of the tibiotalar joint with Steinman nail, however, complications such arthritis has been reported. The others fixed the syndesmosis with a screw for six weeks.

Following surgery, the patient is kept without weight bearing generally in a plaster boot for 6-12 weeks until fracture healing is seen radiographically (8). Physical therapy and range of motion exercises helps to restore joint flexibility.

Treatment results are good in most cases, but some elements have a poor prognosis (9), such as delayed treatment, rupture of the anterior tibial artery, and especially skin lesions that increase the risk of arthritis. Minimal invasive surgical techniques and

external fixation are utilized in these cases.

A few studies have specifically studied the long-term outcomes of ankle fracture dislocation injuries, the outcomes of the series is often less than one year. Lindsjo et al (10) reported the most longer results between 2 and 6 years postoperatively, concerning a series of 306 ankle fracture dislocation.

## **CONCLUSION**

A divergent fracture-dislocations of the ankle are rare injuries. They usually occur in a violent traumatic accident. Immediate ankle reduction and preserving of neurovascular status are crucial for successful patient outcomes.

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

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