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Subtalar Dislocation Case Report and Literature Review

By Tomas Perez Cervera

Introduction- Subtalar dislocation is a simultaneous dislocation of the talo – calcanea and talo – navicular joints without any tibio – talar or talar neck assocaiated fractures. They are very rare injuries, for what few cases are described in the literature.(1) They predominate in young patients about third decade of the life, with a major incident in males that in women (6:1).(2) Usually these are opened injuries, being associated with high energy trauma. The mechanism of injury occurrs in relation with rainfalls, traffic accidents or in the sports practice.(3) They can happen in any direction, producing an important deformity of the ankle. In occasions they can produce fractures on the talus, the ankle or in the fifth metatarsal.(4)

Four types of subtalar dislocation are described:

a) Medial (80 – 85%) → the foot and calcaneus is displaced medially, the head of talus is prominent dorsolaterally and the navicular is situated medially and sometimes dorsal to the talar head. The medial dislocation has been referred to as an "acquired clubfoot,"
b) Lateral (15 – 20%) → the lateral is described in the older literature as an "acquired flatfoot." (2)
c) Posterior and anterior formas are rare (1 – 2.5%)

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Closed reduction of the dislocation must be performed as soon as posible to avoid further damage to the skin and neurovascular problems. If this is not possible, open reduction is recommended. [4]

This lesion was first described in 1811 by Judey and Dufarest, but it was not until 1853 when Broca made the first classification. In 1856, Malgaigne and Buerguer changed the classification of Broca, presenting the classification that is currently used. [5] As discussed above, this is a very rare injury that accounts for 1-2 % of all dislocations and 15 % of lesions of the talus.

II. Case Report

We report the case of a patient of 52 years old with no medical history of interest who comes to the emergency department after falling from a ladder in which it was uploaded (approximately 1.5 m).

The patient complained of severe pain in his right ankle. On examination the foot was appreciated inflamed, deformed and displaced medially. A bony prominence on the anterolateral edge of the foot represented the head of the talus. The skin was tension on the talar region without solution of continuity exist on it. There was no distal neurovascular compromise. At first it was diagnosed in the emergency department as a sprained ankle, which attempted to reduce there but without success.

After AP and lateral radiographs of the foot and ankle were taken, subtalar dislocation was diagnosed. The displacement of the calcaneus and the rest of the foot in relation to the talus was observed. The calcaneus was dislocated medially in the AP and remained neutral on the side. (Figure 1,2,3)

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Figure 1

Figure 2

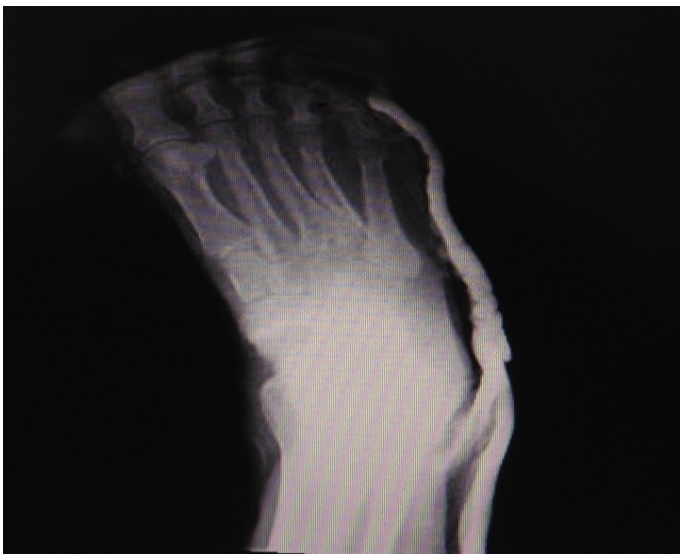

Figure 3

After this, the patient was taken to the operating room where under spinal anesthesia and fluoroscopy control proceeded to carry out the maneuvers described for closed reduction of the dislocation. Flexion of the knee was conducted at 90°, drive shaft keeping the foot plantar flexed and then abduction and eversion of the foot with progressive dorsiflexion. Successful repositioning of the joint, we proceeded to stabilize the subtalar joint and talo - navicular with 2 percutaneous Kirschner wires and immobilize the leg with a posterior splint. After the reduction, we checked the presence of pedal pulse and posterior tibial, and requested a CT scan which confirmed the anatomical reduction and the presence of small fractures or bone avulsion at the level of the calcaneus and cuboid bone. (Figures 4,5)

Figure 4

Figure 5

The patient started a mobilization protocol at 4 weeks, the wires were dropped at 6 weeks and began traveling charge until the tenth week, when he was allowed full charge. At 6 months after the injury the patient has a range of motion similar to the opposite foot subtalar joint.

III. Discussion

From the first classification by Broca, to the expanded classification by Malgaigne and Buerger, an anatomical approach has been used to described this condition. Four types of subtalar dislocations based on the position of the foot relative to the talus have been recognized.[5] The medial dislocation is the most common, and accounts for 80–85 % of all cases. Lateral dislocation represents 15– 20 % of dislocations. The posterior and anterior forms are rare and account for 2.5 % and <1 % of dislocations, respectively.[6] The low incidence represented by the anterior and posterior forms, for some authors, is explained because they cause high instability and can easily become medial and lateral dislocations respectively.[7,8] In the medial dislocation, the foot is initially plantar flexed and inverted, then an external rotation of the talus occurs. The rupture of the dorsal talo - navicular ligament occurs first, then the interosseous ligament tears from anterior to posterior, and the anterior talocalcaneal joint and the posterior talocalcaneal joint are dislocated. The lateral dislocation begins with the foot in eversion. First a deltoid ligament rupture occurs, then a disruption of the interosseous ligament and the talo - calcaneal joint followed by dorsal talo - navicular ligament failure. [9] These lesions should be suspected in patients presenting to the emergency services after sustaining a high energy trauma, injury from sport activities, or twisting forces in the foot. [10] Clinically, there is gross deformity with or without involvement of surrounding soft tissues, which depends on the amount of energy involved and on the elapsed time from the injury. This gross swelling may mask bony deformity. In medial subtalar dislocations, the foot and calcaneous are displaced medially and the talar head is prominent dorsolaterally. Also, the foot is in plantar flexion and supinated. On the other hand, in lateral dislocations the calcaneous is displaced lateral to the talus as well as the navicular, and the talar head lies medially with the foot pronated. Although biomechanical studies have shown a similar pattern of ligamentous injury within lateral and medial dislocations, lateral dislocations more often show soft tissue and bone injury, and a higher need for open reduction. [11,12]

Regarding the request complementary tests, we begin with some plain radiographs that include the AP and lateral projections and the mortise. After the reduction, it may be advisable to request a CT scan to confirm proper articular congruity and rule out associated injuries that may be present between 38.8 and 88 % of cases. [10,12,13] In our case specifically, there were small bone fragments associated with avulsion level calcaneus and cuboid.

Closed reduction of these dislocations should be performed as early as possible to avoid further damage to the skin and neurovascular structures. If this is not possible, then open reduction without further delay is recommended. The closed reduction maneuvers are to be performed, in a first, a knee flexion to relax the gastrocnemius accompanied by a constant drive shaft member in the same direction as the deformity. Then a force is exerted in the opposite direction until dislocation of the talar head is contained in the concavity of the scaphoid. [8, 14]

Once closed reduction is performed, the neurovascular status as well as foot stability should be assessed through prono - supination manoeuvres. Irreducible injuries have been reported in 0 to 47 % of cases. [11,13,15] The most common cause in any type of dislocation is the interposition of bone fragments from associated fractures, which has been described in up to 50 % of cases. In medial dislocations, the most common causes are either entrapment of the talar head within the extensor retinaculum or between the extensor tendons, but also other structures such as the deep peroneal neurovascular bundle can be involved. In contrast, either the posterior tibialis tendon or the flexor halluces longus are the typical anatomical structures interposed in the outer aspect of the talar neck in lateral dislocations. [16,17]

Immobilization can be done with a splint or bivalve posterior plaster, to avoid excessive compression which may favor the presence of a compartmental síndorme. Some authors advocate a period of immobilization of 4-6 weeks may be slightly higher if you have associated injuries. In cases of dislocations submit postreduction instability, they can be used AK or external fixators. When there is no associated instability may start early mobilization around 3 weeks after immobilization. [18,19]

The results of uncomplicated dislocations are reported to be good with some limitation of subtalar joint motion. The poor results were associated with open or lateral dislocations, infection, associated fractures, high energy injuries and failure to diagnose the dislocation promptly. Osteonecrosis has been reported very rarely after this injury.

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