



Case Report

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Medial talar-scapho-calcaneal dislocation: about a case and literature review

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Abstract

Astragalo-scapho-calcaneal dislocation is very rare. The medial variety is the most common. We report a case of a young patient who presented as a result of a road traffic accident with an internal astragalo-scapho-calcaneal dislocation. He received orthopaedic treatment with good clinical and radiological results.

Keywords: Dislocation, Astragalo-scapho-calcaneal articulation, Road traffic accident.

INTRODUCTION

Medial talar-scapho-calcaneal dislocation is defined as simultaneous dislocation of the subtalar and talonavicular joints, without fracture of the neck of the talus, ^[1] or associated tibiofibular talar dislocation. This is a very rare lesion because it represents 1% of all dislocations in traumatology according to some authors ^[2]. The internal variant most often follows a high-energy equine varus trauma ^[3], a fall from a height, a sports accident or a road traffic accident ^[4]. The clinical examination, as well as x-rays of the foot and ankle, make it possible to make the diagnosis. The use of CT is necessary to look for associated osteo-cartilaginous lesions; the most common of which are fractures (malleolar, talus or fifth metatarsal) ^[3]. We report a case of internal astragalo-scapho-calcaneal dislocation in a 30-year-old young man, victim of a road traffic accident.

CASE REPORT

This was a 20-year-old patient, whose body mass index was 32.8 kg/m²; victim of a public road accident which resulted in a fracture of the distal extremity of the left femur of group I.4 of the Chiron classification and an internal astragalo-calcaneal dislocation ipsi lateral.

Clinical examination of the left ankle revealed swelling of the ankle, equinism of the foot with inversion and shortening of the medial edge of the foot.

A sutured wound at the level of the internal retro malleolar gutter and internal displacement of the foot in relation to the leg were also noted (Figure 1).

The pain was maximal in the outer half of the anterior aspect of the left ankle, leading to functional impotence of the limb. The standard x-rays performed allowed the diagnostic confirmation of the fracture of the distal end of the left femur, as well as the internal astragalo-calcaneal dislocation. The fracture of the femur was treated by osteosynthesis (installation of a screw-plate) (Figure 2). The external maneuvers performed in the operating room under general anesthesia with image intensifier control had allowed the orthopedic reduction of the astragalo-calcaneal dislocation. After this reduction, the control radiograph showed good joint congruence for the subtalar and talonavicular joints (Figure 3). The ankle had been immobilized in a cast boot maintained for 6 weeks without authorization from support, given the presence of a screw-plate placed for fracture of the lower end of the lateral ipsi femur. The patient had resumed walking 4 months after the trauma. The functional result of the ankle was good, after a follow-up of 6 months.

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Figure 1: Internal displacement of the foot in relation to the leg



Figure 2: Standard radiographs showing the fracture of the distal end of the left femur treated by osteosynthesis (installation of a screw-plate) above and the internal astragalo-calcaneal dislocation below



Figure 3: X-ray control of the ankle six weeks after internal astragalo-calcaneal dislocation reduction

DISCUSSION

Talar-scapho-calcaneal dislocation is one of the rarest ankle injuries [5]. It accounts for 1 to 2% of all joint dislocations and about 15% of

peritalian lesions when it is acute [4,6]. The sex ratio would be three to four times greater in men [4]. During an ankle trauma, the subtalar foot can escape in 4 directions relative to the talus, which remains in the tibio-peroneal mortise. We can therefore distinguish 4 varieties of astragalo-scapho-calcaneal dislocation: the medial or internal variety, the lateral or external variety, and exceptionally the anterior variety and posterior variety. The internal variety is the most frequent, representing around 80% followed by the lateral 17%. The anterior and posterior forms are rare and represent 3% [5-7]. A subtalar dislocation occurs when an inversion force is applied to the foot in forced dorsiflexion. The sustentaculum tali then acts as a pivot around which the talar neck rotates, thus causing dislocation of the talonavicular joint (rupture of the dorsal talonavicular ligament) followed by dislocation of the talocalcaneal joint (injury of the talocalcaneal interosseous and calcaneofibular ligament). The navicular bone then slides medially to the talus [6]. This mechanism is debatable with the authors; for Baumgartner and Huguier [8], the fibula-calcaneal bundle of the external lateral ligament is torn successively, then the hedge ligament. The push of the foot towards the interior continuing, the astragalo-scaphoid ligament ends up breaking. Giraud and Rachou [9] state that the interosseous hedge is too strong to break; there is rather an inferior disinsertion.

Watson-Jones [10] distinguishes between three types of peritalian dislocations: isolated talocrural dislocations (simple dislocations according to Anglo-Saxon authors), subtalar dislocations between the talus on one side and the calcaneopedial block on the other (these are the double dislocation of the Anglo-Saxons associating subtalar and talonavicular dislocations) and finally the enucleation of the talus or triple dislocation of the Anglo-Saxons, which associates the first two (tibiotalars, subtalars, talonaviculars). The conclusions of the experimental study carried out by Allieu [2] and his team clarified the mechanism of internal subtalar dislocation or astragalo-scapho-calcaneal dislocation, thus justifying the term talar-scapho-calcaneal dislocation. This study describes a different mechanism: the subject suffers a trauma under the foot which is in a weakened position, namely INVERSION and EQUINISM (and not at a right angle or bent on the leg as some authors think: Baumgartner and Huguier, queriu). Astragalo-scapho-calcaneal dislocation corresponds to a total dislocation of the anterior and posterior sub-talar joints, and is accompanied by significant ligament lesions. There is an internal astragalo-scaphoid dislocation with lesion of the dorsal astragalo-scaphoid ligament; the astragalus head then tears the frondiform ligament (splitting of the anterior annular ligament of the tarsus). And the pressure continuing to be exerted, the peroneo-calcaneal bundle of the external lateral ligament ends up breaking. This dislocation occurs as a result of high energy trauma. It is of interest to young male adults whose circumstances of occurrence are multiple, namely: sports accidents, accidents on public roads, falls from a high place, etc.

In our case, the circumstance of occurrence of the lesions was a road accident whose mechanism of occurrence of the dislocation was not well elucidated. However, the presence of associated lesions such as the fracture of the femur proves that it was a high-energy trauma. The diagnosis is generally easy in front of the obvious deformation of the ankle, the foot fixed in eversion. Swelling and edema appear quickly and may mask the deformity. X-rays of the ankle from the front and from the side confirm the diagnosis by showing on the AP radiograph: the calcaneus and the axis of the foot are displaced inwards, the astragalus remains wedged in the mortise and therefore its external part rests in the void. On the profile view: the line space of the subtalar joint is obliterated due to the overlapping of the talus and the calcaneus, the scaphoid surface is empty. CT also confirms the diagnosis and assesses the degree of associated osteocartilaginous lesions [11]. Treatment consists of emergency reduction under general anesthesia using the boot pull maneuver with additional post-reduction compression for an average of 45 days [12]. Irreducibility should raise the suspicion of an interposition and impose a bloody

reduction. The latter was not necessary in our case. After osteosynthesis of the femoral fracture, the patient benefited from a reduction under general anesthesia according to the methods described by the classical authors (Boehler [13]): patient in dorsal decubitus, knee flexed at 90° to release the triceps and one hand is placed on the anterosuperior region of the tibiotarsal ensures the maintenance of the lower limb, the other hand cups and pulls the foot forward in plantar flexion as if to tear off a boot. Some authors, including Malgaigne [14], recommend exerting pressure on the head of the astragalus to guide it towards the articular sphere.

If there is a neck fracture, a transcalcaneal pin can be used. This pin allows traction first in the axis of the leg, then downwards and backwards in order to reduce the anterior dislocation; plantar flexion of the foot reduces the fracture by aligning the neck with the body in a position of equilibrium. Stability is then judged clinically and checked radiologically. Indeed, control radiographs are essential to ensure the anatomical nature of the reduction, an essential criterion for a good functional result. The treatment must be surgical in case of open dislocation and irreducibility. If the reduction is stable, no osteosynthesis is warranted [5]. Rehabilitation remains the key to any good result. It will be undertaken as soon as the plaster or metallic osteosynthesis material is removed in the event that surgical treatment was performed. The prognosis for this dislocation is relatively good for most authors if the reduction is obtained within hours of the accident. The risk of subtalar osteoarthritis and then of talar necrosis are complications to be feared; alongside infections that may be noted in case of open dislocation, stiffness and instability of the joint [6, 15-17]. The functional results of these dislocations mainly refer to the specific hindfoot score of the American Orthopedic Foot and Ankle Society (AOFAS) from 0 to 100.

CONCLUSION

Astragalo-scapho-calcaneal dislocation is rare. It is a serious medico-surgical emergency of the ankle whose diagnosis is clinical, confirmed by a radiological examination. Its treatment, most often orthopedic, is completed by a rehabilitation of about six weeks after reduction; which allows in the majority of cases to obtain a good functional result. Subtalar osteoarthritis and later avascular necrosis of the talus remain the complications to be feared.

Author contributions

All authors have contributed substantially to the completion of this work, and declare no conflict of interest.

Conflicts of interest

None declared.

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