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Case Report

Isolated talus dislocation: a case report

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Abstract

Peritalar dislocation is a rare injury, usually associated with fractures. It mainly affects males in high-energy traumas such as falls from height, car accidents, or even torsional traumas during the practice of sports activities. This study illustrates a case attended by the authors to discuss peritalar dislocation and its diagnosis, classification, treatment, and prognosis. Such injury may evolve with complications if not properly managed, including ankle movement pain, joint stiffness, deformities, post-traumatic arthrosis, and even osteonecrosis.

Level of Evidence V; Therapeutic Studies; Expert Opinion.

Keywords: Joint dislocations; Talus; Subtalar joint; Case reports.

Introduction

Peritalar dislocations, without associated fractures, are rare injuries (1 to 2% of all traumatic dislocations), occurring dislocation of the talocalcaneal and talonavicular joints[1]. The literature shows that the talonavicular and talocalcaneal ligaments are injured, but the calcaneonavicular ligament remains intact in most cases. In addition, it was also shown that about 80% of the dislocations are medial[1]. These are injuries with a good prognosis, especially those closed if diagnosed correctly and properly reduced, followed by six weeks of immobilization and intensive rehabilitation[2].

The aim of this study is to illustrate a case attended and follow-up by the authors to discuss peritalar dislocation and its diagnosis, classification, treatment, and prognosis.

Case description

This study was submitted to the Research Ethics Committee of the institution, and the patient signed an informed consent form.

A 51-year-old male patient with a history of right ankle torsional trauma, evolving with an inability to ambulate and apparent deformity. Before the injury, he did not present any musculoskeletal disorders or trauma.

On orthopedic physical examination, he presented apparent deformity in the right ankle region, significant pain, joint incongruence, intact skin, and no neurovascular damage. The peritalar dislocation without associated fracture was evidenced in the first radiograph. After intraarticular local anesthesia, the patient was subjected to a reduction maneuver through traction and movement against the deformity, and then a plaster cast immobilization was made. Post-reduction control radiography was performed. After verifying the joint congruence reestablishment, the patient was submitted to computed tomography. At the end of the consultation, the patient was referred for outpatient follow-up (Figures 1, 2, 3 and 4).

On outpatient return one week after the trauma, the plaster cast immobilization was in good condition. Upon immobilization removal, intact and uninjured skin, preserved neurovascular of the foot and right ankle, and the stable joint was observed. New plaster cast immobilization was made, and the patient was instructed again regarding the injury and its severity, maintaining the conservative treatment. A nuclear magnetic resonance examination was requested for documentation and verification of the evolution of ligament injuries.

Study performed at the Hospital do Servidor Público Estadual – IAMSPE, São Paulo, SP, Brazil.

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Discussion

Peritalar dislocation is defined as the dislocation of the subtalar and talonavicular joints without the involvement of the ankle or calcaneocuboid joint[3].

The talus is composed of the foot joint with the ankle, and together with the calcaneus, they are important for ambulation. In addition, the talus is involved in various planes of movement and is responsible for the pressure and traction forces of the foot.

It has a cuboid shape divided into three parts: head, neck, and body, 66% covered by cartilage. The head articulates anteriorly with the navicular bone, responsible for the adduction and abduction movement. The body articulates inferiorly with the calcaneus, accountable for the inversion and eversion movement. Its upper portion articulates with the tibia and fibula, responsible for the ankle dorsiflexion and plantarflexion movement. The neck does not have articular cartilage and receives ligament and capsular insertions (anterior and posterior talofibular and deltoid ligament, the latter composed of the talocalcaneal, tibionavicular, and tibiotalar ligament). The talus vascularization occurs by the blood supply of the capsule and ligaments (vulnerable to injury) and mainly by the anastomosis formed by the tarsal canal and the tarsal sinus arteries. In addition, the deltoid artery (posterior tibial artery branch) supplies to the medial body; the fibular artery contributes to the posterior supply, and the dorsal artery supply the talus head. Therefore, due to the rich vascularization, avascular necrosis of the talus is a rare occurrence after peritalar dislocation[4] (Figures 5, 6 and 7).

Figure 1. Photograph of the patient's right foot and ankle, the prominence of the talus head in the region of the tarsal sinus. Note the calcaneus in inversion and plantarflexion.

Figure 2. Initial radiograph of the right ankle showing talus dislocation without fractures.

Figura 3. Radiography of the right ankle post-reduction of talus dislocation, using a plaster cast immobilization, being possible to visualize the tibiotalar joint congruence reestablishment.

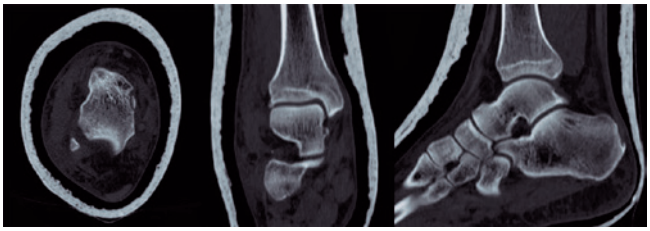

Figura 4. Computed tomography (axial to the left, sagittal in the center, and coronal to the right) post-reduction of pure talus dislocation, showing no associated fractures.

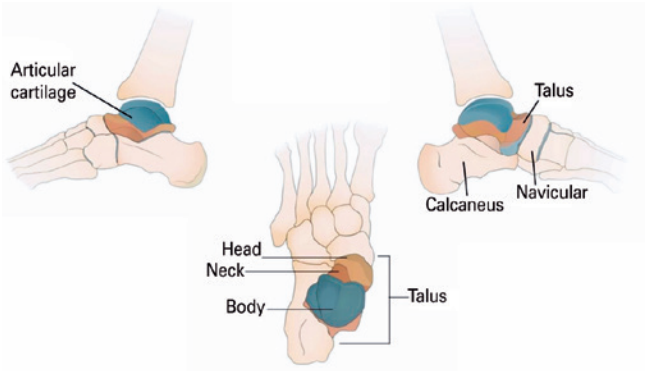

Figura 5. Bone anatomy of the talus.

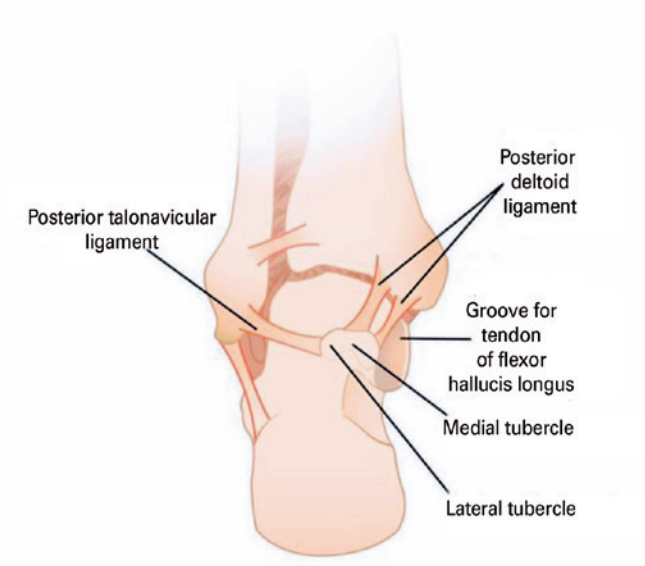

Figure 6. Ligamentous anatomy of the talus.

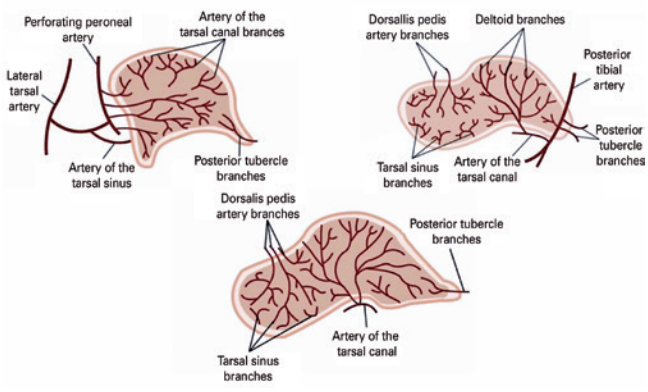

Figure 7. Blood supply of the talus.

Usually, a dislocation or a fracture of this bone results from severe trauma related to falls from height, automobile accidents, torsional trauma, or even during sports[1,2,5,6]. It mainly affects young males around 30 years of age[1,5,6].

They are considered rare injuries due to their ligament complex and the capsule that surrounds the ankle, which is strong and well structured. However, we must also consider that the trauma must be high-energy and multidirectional[1]. In cases of medial peritalar dislocation, the most common, low-energy torsional trauma ("basketball foot") was reported[1,6,7]. According to DeLee[5] posteromedial dislocations are the most reported, followed by anterior tibiotalar dislocation and dislocations with tendon interposition.

The mechanism of trauma most associated with tibiotalar dislocations combines inversion, maximum plantarflexion, and high-energy axial trauma.

In the orthopedic evaluation, the patient reports severe pain, functional incapacity of the affected limb, and visible deformity. In the case of medial injuries, like in this report, the talus head is prominent in the sinus tarsi region, with the calcaneus in inversion and the foot in plantarflexion. In lateral injuries, the talus head is evident in the medial region of the foot, with the calcaneus in the lateral position and the lateral column of the foot apparently shortened. In posterior dislocations, the foot appears elongated, and in anterior dislocations, the foot seems to be "shortened" to the contralateral foot.

Often there may be neurovascular injury due to compression of the neurovascular bundle and the inability to palpate the pulses distally to the injury[7,8].

The diagnosis is confirmed through foot and ankle radiographs, also computed tomography to search for fractures not easily identified on radiographs[1] and evaluate possible osteochondral injury in the subtalar or talonavicular[1,5,8]. In addition, magnetic resonance imaging can also be performed since they are important to search for musculoligamentous injuries.

Regarding the descriptive classification proposed by Broca in 1853, peritalar dislocations were subdivided into medial, lateral, and posterior[1,5,9,10]. In 1856, Malgaigne added the anterior dislocation, which is even rarer[1,6,11]. This classification considers the position of the foot to the talus:

- Medial: peritalar most common dislocations, when the foot moves medially to the leg, resulting in a deformity in inversion, plantarflexion, and adduction;
- Lateral: the foot moves laterally to the leg axis, with severe deformity in eversion, abduction, and pronation. More related to high-energy trauma, with soft tissue integrity at risk, with risk of exposed injury and associated fractures;
- Posterior: rare, the foot seems shortened in posterior peritalar dislocations and elongated in anterior dislocations due to the flattening of the hindfoot (important plantarflexion);
- Anterior: even rarer, there is rupture of the interosseous ligament due to anterior traction, with anterior dislocation of the foot to the talus.

Treatment begins with immediate reduction, decreasing the risk of skin necrosis and vascular impairment. Closed reduction is possible in most cases, performed with the knee flexed, seeking relaxation of the gastrocnemius muscles, and completing the opposite dislocation movement[1]. It is necessary to pay attention to the presence of compartment syndrome. Again, it is important to emphasize the importance of performing computed tomography to search for fractures not easily identified on radiographs[1] and evaluate possible osteochondral injury in the subtalar or talonavicular[1,5,8]. Closed reduction is not possible in up to 30% of cases due to soft tissue interposition or significant edema caused by diagnostic delay. In these situations, an open reduction is indicated, manual removal of the extensor retinaculum involving the talus head, interposition of the deep fibular nerve, the flexor hallucis longus tendon, the fibular tendon, the talonavicular capsule or even the impact between the navicular and the talus head[1,3].

The access route is in the prominent region of the talar head, and other accesses may be performed depending on the associated injuries. The immobilization time is variable: if the peritalar dislocation is isolated, that is, without fractures or other associated injuries, the plaster cast can be used for three to 12 weeks[7]. Another point still under discussion is the immobilization time since the short time favors subtalar instability and, if prolonged, subtalar stiffness[7,8]. If the reduction is unstable, it is decided to fix the subtalar through the Kirschner wires and associated fractures, if present. Primary subtalar arthrodesis is indicated in cases with large osteochondral fragments and joint surface involvement. In exposed injuries, the external fixator is used as a treatment option[1,3].

In cases where there is a delay in reducing dislocation, the talus head can lead to ischemia and, in later cases, skin necrosis. If soft tissues are compromised, debridement of this devitalized tissue is indicated and, when possible, its coverage[8]. Neurovascular injury is more related to exposed injuries and lateral dislocations since they involve high-energy trauma.

The residual instability remains insignificant, and there are no other losses in cases of adequate diagnosis and treatment[2]. As for the immobilization time, no consensus was reached, but immobilization for at least six weeks is of great value. Another important factor for the patient's rehabilitation is to follow up the physiotherapy to maintain good functional resolution.

Most patients do not develop complications. However, in some patients, it was observed that there was subtalar arthrosis, the ones treated with leg-foot orthoses or, in some cases, triple arthrodesis. In addition, it is known that lateral injuries, exposed medial injuries, or dislocations associated with fracture, have a worse prognosis[8].

Conclusion

The objective of this study was to present a case of talus dislocation correctly conducted and diagnosed, in which the patient evolved with a satisfactory final result. A good evaluation in primary care with adequate orthopedic physical examination, subsidiary examination, and a well-applied reduction maneuver associated with appropriate plaster cast immobilization contribute to the patient's recovery. In addition, it is important to highlight the physiotherapy protocol as an ally of a good clinical result.

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