Isolated medial subtalar joint dislocation. A case report

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Case Report

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Background:
Medial subtalar dislocations are rare injuries characterized by dislocation of the talocalcaneal and talonavicular joints without affecting the calcaneocuboid joint. These injuries typically result from high-energy trauma and are often associated with inversion mechanisms. This report presents the case of a 20-year-old male who sustained a medial subtalar dislocation of the left ankle while playing volleyball. Initial management involved closed reduction under sedation, followed by immobilization and physical therapy. At the one-year follow-up, the patient demonstrated stable joint function, and achieved a high functional score (AOFAS 90). This case underscores the importance of timely diagnosis, appropriate reduction, and structured rehabilitation in optimizing functional outcomes for medial subtalar dislocations.

Keywords: Subtalar dislocation, ankle injury.

Subtalar dislocations are rare and severe injuries involving the dislocation of the talocalcaneal and talonavicular joints. The medial form is the most common (80-85%), often caused by foot inversion, while lateral dislocations are less frequent but have a poorer prognosis due to extensive soft tissue and bone injuries (1–3). These dislocations are usually diagnosed through X-rays and computed tomography to rule out hidden fractures (4,5). Initial treatment consists of an urgent closed reduction to prevent tissue damage, with open reduction required in complex cases (5,6). Complications include subtalar arthritis (40-89%) and avascular necrosis of the talus, primarily in open dislocations, with prognosis depending on the timeliness of intervention (5,7,8).

Case report

Informed consent was obtained from the patient for the use of anonymized images and case reporting. A 20-year-old male presented to the emergency department via ambulance with pain and deformity of the left ankle. His medical history included overweight status. The patient reported that, while playing volleyball, he performed a jump with rotation, and upon landing, experienced a forced inversion of the left ankle, resulting in severe pain, inability to bear weight, and visible deformity (Figure 1).

Radiographs were obtained (Figure 2), and the patient was evaluated by the trauma and orthopedic team, who, based on radiographic findings, scheduled an urgent closed reduction under sedation. Multimodal analgesia was administered, and sedation was performed by the anesthesiology team. The dislocation was successfully reduced without complications. A Jones bandage with a posterior ankle splint was applied, and the patient was discharged with analgesics and instructions to avoid weight-bearing on the affected foot, using crutches for ambulation.

Two weeks later, the patient returned for follow-up with generalized edema and ecchymosis of the left ankle and foot, with 10 degrees of plantar and dorsiflexion. Anterior drawer, varus, and valgus stress tests were negative. Neurological function and crepitus were absent. Partial weight-bearing with a short Walker boot was prescribed for four weeks, along with 10 sessions of physical therapy and rehabilitation. A computed tomography (CT) scan of the foot was also ordered.

At the third follow-up, after completing 10 physical therapy sessions, the patient reported pain during ambulation. Physical examination showed left ankle stability with persistent edema. CT imaging

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Figure 1. Photograph showing the evident deformity of the left ankle due to medial subtalar dislocation

(Figure 3) revealed no fractures, supporting the continuation of physical therapy; an additional 10 sessions were prescribed, and use of the Walker boot was extended for four more weeks.

At a fourth follow-up, four weeks after the previous visit, and after a total of 20 physical therapy sessions, the patient reported painless ambulation but presented with stiffness in plantar flexion and soft tissue swelling. Stability of the ankle and midfoot was confirmed. Discontinuation of the Walker boot was advised, and light exercise, such as short walks, was recommended.

Four weeks later, a follow-up ankle radiograph was obtained. The patient reported full resolution of symptoms. Anteroposterior and lateral radiographs showed no signs of arthritis or exostosis, with maintained joint congruence. An AOFAS (American Orthopaedic Foot & Ankle Society) score was performed, showing 69 points. The patient was discharged from the orthopedic service with instructions to gradually resume normal activities six months post-dislocation.

At the final follow-up, 12 months after the dislocation, the patient reported good general health, with only occasional pain during sports activity (AOFAS score of 90 points).

Discussion

Subtalar dislocations, also known as transcalcaneal talonavicular or peritalar dislocations, involve the simultaneous dislocation of the

Figure 2. Anteroposterior and lateral radiographs of the left ankle showing a medial subtalar dislocation with no evidence of fracture

talocalcaneal and talonavicular joints without affecting the calcaneocuboid joint. These dislocations can occur in any direction and cause significant deformity; they are classified according to the position of the distal foot relative to the talus as medial, lateral, anterior, or posterior. Anterior and posterior dislocations account for less than 3% of all subtalar dislocations. Lateral dislocation, also referred to as "acquired flatfoot," is the second most frequent, occurring in 15–20% of cases. Finally, medial dislocation, sometimes termed "acquired clubfoot," is the most common, comprising approximately 80–85% of subtalar dislocations and is usually caused by an inversion mechanism of the foot (1,2).

Pure subtalar dislocations are rare, representing less than 1% of all major joint dislocations, partly due to the presence of strong ligament structures adapted to bear loads, such as the talocalcaneal and cervical ligaments. High-energy

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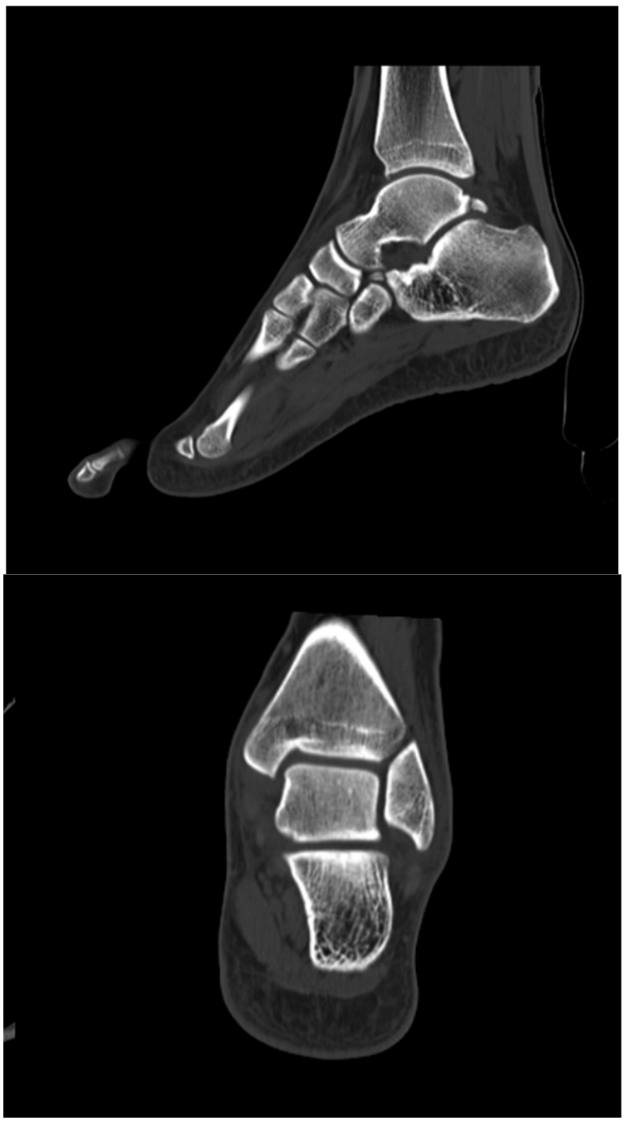

Figure 3. Computed tomography of the ankle showing sagittal and coronal views with no evidence of fracture.

trauma, such as traffic accidents, high-impact sports, or falls from height, is the main cause of these injuries. The mechanism typically involves forced inversion of the forefoot when the foot is in plantar flexion, and these injuries are more common in men due to high-energy trauma, such as falls, high-impact sports, or traffic accidents. Subtalar dislocations are most frequently seen in patients in their thirties and are ten times more common in men than in women(3–5).

The subtalar joint is a complex structure comprising the posterior talocalcaneal and talocalcaneonavicular articulations, allowing inversion and eversion movements essential for foot stability. In medial dislocation cases, the foot shifts medially relative to the talus, which pivots on the sustentaculum tali. This displacement is caused by a significant inversion force applied to the foot in plantar flexion, resulting in the rupture of lateral ligament structures, such as the extensor retinaculum and talonavicular ligaments, allowing for dislocation(6,7).

The primary stabilizers of the subtalar joint include the calcaneofibular ligament, the deltoid ligament, and the interosseous talocalcaneal complex, the latter being especially important for preventing excessive inversion and eversion movements that could compromise joint stability(8).

Initial management of subtalar dislocation requires a clinical evaluation to determine the type of injury (open or closed), the neurovascular status of the limb, and any associated injuries, which are common in high-energy trauma. Diagnosis is based on the injury mechanism and imaging studies, including anteroposterior (AP) and lateral radiographs of the ankle, often supplemented with computed tomography (CT) to assess joint alignment and rule out hidden fractures. Characteristic images show loss of congruence in the subtalar and talonavicular joints, with displacement of the calcaneus relative to the talus (4,5).

Subtalar dislocations require urgent treatment. Once the injury type is identified, a closed reduction under sedation is performed to prevent soft tissue deterioration, neurovascular compromise, and cartilage damage. This maneuver is effective in most cases, with a success rate of up to 65%. After reduction, joint stability and distal perfusion are verified, and the limb is immobilized with a posterior splint(3,6,7).

A post-reduction CT scan is recommended to detect associated fractures or intra-articular loose bodies. During immobilization, radiological and clinical follow-up is essential to monitor soft tissue status. After this period, progressive weight-bearing rehabilitation begins, with full weight-bearing achieved around 12 weeks (3,5,7).

In cases of irreducible dislocations or entrapment of structures such as the posterior tibial tendon, open reduction is used, with Kirschner wires or an external fixator for joint stabilization if needed(14).

Functional outcomes of medial subtalar dislocations are generally favorable if rapid reduction and appropriate rehabilitation are achieved. Most patients regain satisfactory range of motion, although up to 80% experience some restriction in subtalar mobility(15).

The most common complications in subtalar dislocations include subtalar arthritis, avascular necrosis of the talus, and chronic instability. Subtalar arthritis is the most frequent complication, with an incidence of 40-89%, which can develop even after precise reduction due to initial cartilage damage at the time of injury. Avascular necrosis of the talus occurs in 0-10% of closed dislocations and up to 50% of open dislocations, due to the high risk of vascular compromise in these cases. Chronic instability,

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meanwhile, can result from inadequate immobilization and, in certain cases, may require additional surgical intervention, such as arthrodesis, to restore joint stability(3,7,8).

Approximately 50-65% of medial dislocations have associated fractures, a proportion higher than in lateral dislocations. The latter usually have a worse prognosis due to a high incidence of bone injuries, ligament complex damage, and extensive soft tissue injuries; they frequently present as open dislocations resulting from high-energy trauma. In general, around 50% of subtalar dislocations are accompanied by fractures, with isolated dislocations being rare(3,9).

The prognosis for subtalar dislocations is closely related to the trauma's energy and the time elapsed before reduction. In cases of medial dislocation without associated fractures, conservative treatment with closed reduction and early rehabilitation often yields favorable outcomes. However, when high-energy trauma or associated fractures are present, the prognosis becomes more guarded, with a higher incidence of long-term complications(2).

Conclusion

Medial subtalar dislocations require prompt and precise management to prevent complications and achieve favorable long-term outcomes. This case demonstrates that early reduction and a structured rehabilitation program can result in successful joint recovery and high functional performance. Regular follow-up is essential to monitor potential complications, including arthritis and joint instability, that may arise in cases involving high-energy trauma.

Conflicts of interests

There was no conflict of interest during the study, and it was not funded by any organization.

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