



Medial Subtalar Dislocation of the Foot Associated with an Acute Compartment Syndrome: A Case Report

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Subtalar dislocation an uncommon injury, accounts for approximately 1% to 2% of all joint dislocations. Subtalar dislocation, also known as peritalar dislocation, refers to the simultaneous dislocation of the distal articulations of the talus at the talocalcaneal and talonavicular joints.² This case report presents a rare situation of a medial subtalar dislocation complicated by an acute compartment syndrome that required an urgent fasciotomy which has never been reported before.

Key words: Subtalar dislocation, Compartment syndrome, Closed reduction, Fasciotomy.

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The subtalar dislocation occurs through the disruption of 2 separate bony articulations, the talonavicular and talocalcaneal joints.^{1,2} These joints act as a hinge that transmits load and movement from the foot to the ankle. Subtalar dislocation is an uncommon injury that disturbs the normal anatomy and function of these joints. The medial dislocation, also known as an acquired clubfoot, is the most common of all subtalar dislocations, comprising approximately 80% to 85% of the cases.³ The medial dislocation occurs through forceful inversion of the forefoot with the talar neck pivoting on the sustentaculum tali, which acts as a fulcrum to lever the calcaneus from the talus.

Initially, it is believed that the talonavicular joint is the first to dislocate, followed by rotary subluxation through the subtalar joint, with the talar head finally coming to rest between the extensor hallucis longus and the extensor digitorum longus on either the cuboid or navicular.⁴ We present a rare case report of a 36-year-old male with a medial subtalar dislocation that was complicated by an acute compartment syndrome of the foot.

Case Report

A 36-year-old male presented to our hospital 12 hours after sustaining trauma to his right foot due to a twisting injury in his farm when he was carrying a heavy load over his right shoulder. He also gave a history of some manipulation by a quack, which did not give him any relief, but the intensity of pain increased following manipulation.

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Figure 1 The anteroposterior and Lateral radiograph of right foot showing a medial subtalar dislocation.

On examination, the patient was fully conscious and local examination revealed a deformity of the right foot with a prominence medially with tense swelling of the foot. Immediate radiographs in the emergency revealed a medial subtalar dislocation. (Fig.1) The dislocation was reduced in the emergency without anesthesia with gentle longitudinal and lateral traction of the foot, resulting in anatomic reduction of the talocalcaneal and talonavicular joints. (Fig.2) A posterior splint was applied and the limb was kept elevated and patient was observed every 15 minutes for two hours. The patient continued with pain, marked swelling encompassed the entire foot, with relative sparing of the digits. Sensation to pin prick was present to all the toes and web spaces, but two point discrimination was diminished. Pain on passive motion of the toes was present. The medial-plantar aspect of the foot (medial compartment) was particularly tense and swollen.

Severe bruising of the foot was evident. Further, there was pitting edema on the dorsum of the foot. (Fig.3 and 4) The toes were slightly pale and capillary refill was approximately 3 seconds on right and \leq less than 2 seconds on left foot. Sensory examination revealed continued paresthesia in the same distribution. After clinical examination, a decision for a fasciotomy was made. Intra-operatively tense compartment was confirmed and bulging muscle was noted in the medial incision.



Figure 2 Immediate Post reduction anteroposterior and lateral radiograph of same patient.

Immediately postoperatively, the foot was placed in a well-padded splint, elevated, and intravenous antibiotics administered (cefazolin). Five days later, the fasciotomy wounds were closed. The patient was discharged on the day following fasciotomy closure. Follow-up at 2 years revealed well-healed incisions, absence of neuromuscular deficits with excellent functional recovery with no signs of AVN of the talus.

Discussion

Subtalar dislocations are rare, accounting for only 1% to 2% of all dislocations.¹ Smith noted only seven dislocations in a review of 535 dislocations of all types.⁵ Leitner noted only 42 among 4215 dislocations.⁶ Although first described in 1811 by Judy and Dufaurets, it involves the disruption of the talocalcaneal and talonavicular joints, while the calcaneocuboid joint remains intact.⁶



Figure 3 and 4 Clinical photographs of patient showing tense foot compartment prior to fasciotomy.

Subtalar dislocation can occur in any direction. Significant deformity is always present. Up to 85% of dislocations are medial.³ The calcaneus, with the rest of the foot is displaced medially while the talar head is prominent in the dorsolateral aspect of the foot. The navicular is medial and sometimes dorsal to the talar head and neck. Lateral dislocation occurs less often. In a lateral dislocation, the calcaneus is displaced lateral to the talus and the talar head is prominent medially. The navicular lies lateral to the talar neck. Rarely, a subtalar dislocation is reported to occur in a direct anterior or posterior direction, but these are usually associated with medial or lateral displacement as well. The direction of subtalar dislocation has important effects with respect to management and outcome. The method of reduction is different for each type of injury.

Radiographs of a subtalar dislocation may be difficult to interpret. The severity of the deformity makes it difficult to obtain true anteroposterior and lateral images of the foot, and standard ankle radiographs do not reveal the foot pathology.⁷

It is important to note that the relationship between the talus and tibia and fibula is normal in a peritalar dislocation because the point of injury is distal to the ankle joint. The anteroposterior view of the foot demonstrates the talonavicular dislocation. Usually interpretation of the plain radiographs provides enough information to determine the direction of the dislocation, such that the physician can proceed with an attempt at reduction.

All subtalar dislocations require a gentle and timely reduction. In most cases, reduction can be accomplished closed. Often the injury presents with skin tenting such that a prompt reduction will reduce the possibility of skin necrosis. Once the reduction is accomplished, it should be confirmed by clinical examination and radiographs. The outcome following simple dislocations treated with closed reduction seems to be favorable.⁸ In some series, as few as 10% of patients with medial dislocations and 15% to 20% of lateral subtalar dislocations required open reduction.⁶ Recent series, particularly from trauma centers, have noted the need for open reduction to be more common, with 32% of patients requiring open reduction in one series.⁹ A variety of bone and soft tissue structures may become entrapped, resulting in a block to closed reduction. These impediments require open manipulation or release to facilitate reduction.

Subtalar dislocations have a wide variance in terms of their prognosis. Uncomplicated subtalar dislocations, stable following a closed reduction, have an excellent prognosis with minimal symptoms at long-term follow-up.⁸ Certain subtalar dislocations are clearly associated with a worse prognosis. Lancaster, et al., in a review of the literature, noted that associated injuries and complications were associated with a worse result. In particular, soft tissue injury, extra-articular fracture, intra-articular fracture, and osteonecrosis were associated with a worse outcome.¹⁰ Open fractures are undoubtedly associated with the poorest results. Goldner et al., reviewed 15 patients at a mean of 18 years following open subtalar dislocations. Associated injuries were noted to the tibial nerve in 10 patients; to the posterior tibial tendon in 5; and to the posterior tibial artery in 5. Seven patients ultimately required arthrodesis due to osteonecrosis or post traumatic arthritis.¹¹

Osteonecrosis of the talus may develop following peritalar dislocations. Overall, osteonecrosis is uncommon and generally only noted with high-energy and open injuries. Theoretically, the talus is not displaced from the ankle mortise and therefore at least some of the blood supply should be preserved. However, Goldner, et al., noted osteonecrosis in 5 of 15 patients with grade 3 open subtalar dislocations.¹¹ In addition, Bibbo, et al., also observed osteonecrosis in three patients.⁹ Although our case was complicated by development of a compartment syndrome but timely intervention resulted in an excellent result in our case.

Conclusion

The majority of subtalar dislocations can be treated in a closed manner with a period of nonweight bearing and immobilization with satisfactory results. Occasionally, these patients may develop a compartment syndrome which, if not treated in time, may lead to catastrophic results. A high clinical suspicion and observation is warranted especially in cases with delayed presentation to diagnose such a condition early and manage it in a timely manner.

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