

# A Complex Open Subtalar Joint Dislocation With a Concomitant Talar Neck and Medial Malleolus Fracture: A Case Report

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## Statement of Purpose

To date, the occurrence of open subtalar joint dislocations remain extremely rare, as such there are limited resources or references demonstrating the proper surgical treatment. This case study documents a rare look at an open subtalar joint dislocation with a concomitant talar neck and medial malleolus fracture and its surgical management.

## Case Study

41 year old male was seen in the ED after falling from a roof sustained an open subtalar joint dislocation with a talar neck fracture. Upon a lower extremity examination, neurovascular compromise with absent pedal pulses was noted. Multiple attempts at closed reduction were unsuccessful. He underwent a CT angiogram demonstrating poor visualization to the lower extremity and was subsequently transported to the operating room for emergent surgical intervention.

In the OR, open reduction was performed and spontaneous revascularization was achieved. An external fixation device was applied to maintain distraction of the ankle joint and reduction of the subtalar joint. A postoperative CT with 3D reconstruction revealed a displaced, comminuted medial malleolar fracture lodged in the sinus tarsi with an intra-articular talar neck fracture.

Further surgical intervention was delayed until the soft tissue envelope was normalized. One week after the injury, he underwent an ORIF of both the talar neck and medial malleolus. The external fixation device was adjusted to maintain stability. The patient was non-weight bearing for an additional 6 weeks until a Hawkins sign was demonstrated. External fixation was removed and physical therapy was initiated.

## Literature Review

Open subtalar joint dislocations are rare and account for approximately 1-2% of all dislocations<sup>1</sup>. The mechanism of injury is trauma to the plantar flexed foot with either inversion, resulting in medial subtalar joint dislocation (85%), or inversion in lateral dislocations (15%)<sup>3</sup>. In medial subtalar dislocations, the sustentaculum tali acts as a lever arm for the talar neck and may display a medially displaced heel, inversion, and plantarflexion of the foot, resembling an acquired clubfoot deformity<sup>1</sup>.

Due to the high-energy nature of these dislocations, approximately 21% are open STJ dislocations and can have a talar neck fracture component<sup>8</sup>. Associated fractures, AVN of the talus, and infection are not rare and often result in a poor prognosis<sup>3,4</sup>. The key to preventing further soft tissue damage and neurovascular compromise is prompt reduction<sup>1</sup>. In approximately 90% of medial subtalar dislocations, closed reduction is possible, but soft tissue structures or bony debris may block reduction and require ORIF<sup>1,2</sup>.



## Literature Review (continued)

The goal of talar neck fracture treatment is anatomic reduction because even minimal displacement can adversely affect STJ mechanics<sup>5</sup>. If open reduction is not feasible immediately, the use of external fixation can distract the ankle joint, unload the talus and reduce the incidence of AVN<sup>3</sup>. Talar neck fractures and STJ dislocations do not come without associated complications and frequently develop AVN, malunion (35%), nonunion (2.5%), chronic pain, swelling, and post traumatic arthrosis with limited STJ motion<sup>6,7,3</sup>.



## Analysis and Discussion

Subtalar joint dislocations are historically very challenging to reduce secondary to soft tissue impingement. The additional talar neck and medial malleolar fractures are complicated by vascular insult resulting in a higher risk of avascular necrosis. These injuries have a high risk of infection and post-op arthritis with an overall poor prognosis, despite adequate surgical management.

## References

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