Talar Neck Fracture with Medial Subtalar Joint Dislocation: A Case Report

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Statement of Purpose

The purpose of this study was to report a unique case of a closed talar neck fracture with medial subtalar joint dislocation following a mechanical fall from a ladder. This rare and traumatic injury was treated with open reduction internal fixation of the talar neck fracture with subtalar joint (STJ) arthrodesis with the aim of avoiding the development of avascular necrosis of the talus following the traumatic injury.

Literature Review

Traumatic injuries of the talus are rare but can pose as severe debilitating injuries with increased risk of infection, delayed union, non-union, malunion, avascular necrosis and post-traumatic arthritis. They are mainly due to high-energy mechanism of injury, such as fall from a height or motor vehicle accident (1). Talar neck fractures account for approximately 30% of all talar fractures (2) and may be coupled with subtalar joint dislocation (3) at the time of injury. The most common direction of subtalar joint displacement is medial secondary to plantarflexion inversion mechanism of injury and has previously been described as resembling an acquired clubfoot deformity (4). The development of post-traumatic arthritis including subtalar joint, and ankle joint arthritis is dependent upon the extent and severity of the injury (5,7). Development of avascular necrosis is a frequent complication associated with talar neck fractures and is seen more frequently as the severity of the fracture/dislocation occurs resulting in increased soft tissue trauma and damage to the talar blood supply (6,7). Management of these talar neck fracture/dislocation patterns requires prompt reduction and fixation to protect the remaining blood supply to the body of the talus and to promote revascularization (7). Vallier et al. noted an increase in development of avascular necrosis and talar dome collapse based on greater initial fracture displacement based on the Hawkins classification. However, they observed no correlation between timing of surgery and subsequent development of avascular necrosis with or without talar dome collapse based on their study.

Case Study

A 69-year-old male was consulted in the ED following a fall from ladder with a closed gross deformity of left foot/ankle upon presentation. Patient had diminished DP and PT pulses but dopplerable. Patient underwent closed reduction of the deformity under conscious sedation. Palpable pulses noted following closed reduction. Post-reduction films were obtained noting good osseous alignment and a posterior splint was applied. Patient underwent talar ORIF and STJ arthrodesis 12 days following the initial injury.

Results

One traumatic case of talar neck fracture with medial subtalar joint dislocation in a 69-year-old male, that underwent operative fixation with talar ORIF and STJ arthrodesis was reviewed. Plain film radiographs demonstrated talar neck fracture with complete medial STJ dislocation without disruption of the talonavicular or ankle joint. Patient was weightbearing as tolerated at 102 days postoperatively. At 24 months follow up the patient continues to be followed annually in the office and remains asymptomatic with an uneventful post-operative recovery.

Analysis and Discussion

Traumatic injuries of the talus are rare but can pose as severe debilitating injuries with increased risk of infection, delayed union, non-union, malunion, avascular necrosis and post-traumatic arthritis. They are mainly due to high-energy mechanism of injury, such as fall from a height or motor vehicle accident and may be coupled with subtalar joint dislocation. Based on the severity of the injury, subtalar joint arthritis may subsequently develop and require surgical intervention if refractory to conservative care. Current treatment options for talar neck fracture/dislocations is ORIF to restore talar alignment in order to optimize limb function. Presence of osteonecrosis may be managed further by immobilization, protected weightbearing or surgical intervention. Talar non-unions or malunions are addressed surgically with the goal of realignment and osseous union of involved bone(s). Development of post-traumatic arthritis of involved joint(s) is managed with arthrodesis to aide in pain reduction and optimize hindfoot alignment. In the present case report, the patient resolved uneventfully following surgical intervention following talar neck fracture with medial STJ dislocation.

Previous literature has supported the development of avascular necrosis and talar dome collapse based on the severity of the initial fracture displacement based on the Hawkins (2) and modified Canale and Kelly (8) classification with up to 50% of Hawkins II fractures potentially developing osteonecrosis. Based on these findings previously supported in the literature, operative management was aimed at anatomic reduction of the fracture/dislocation, mitigating the development of avascular necrosis and addressing the potential development of subtalar joint arthritis based on initial fracture/dislocation and patients age with talar ORIF and STJ arthrodesis by imparting the rich cancellous calcaneal blood supply when coupled with a STJ arthrodesis.

References

4. Bohay DR, Manoli A. Subtalar Dislocations. Foot Ankle Int. 16(12): 803-808, 1995