

Case Report

Subtalar dislocation with ipsilateral shaft of femur fracture: a case report

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ABSTRACT

Fractures and ligamentous injuries of the foot are significant and challenging injuries in the context of orthopaedic trauma. Foot fractures & dislocations are regarded as the most frequently missed extremity injuries. Subtalar dislocations account for about 1% of total dislocations & when combined with ipsilateral femur shaft fractures makes them even rare and with more associated complications. Subtalar joint stability is determined by its ligamentous structures. These dislocations involve dislocation of talocalcaneal and talonavicular joints. AVN, Arthritis and chronic instability may arise post reduction and are dreaded long term complications and hence emphasis on timely reduction.

Keywords: Subtalar dislocations, Hindfoot, Peritalar dislocations, STJ instability, Ligaments of subtalar joint

INTRODUCTION

Subtalar dislocation, also known as talocalcaneonavicular or peritalar dislocation, is characterized by synchronous dislocations of the subtalar which is talocalcaneal and the talonavicular joint. These joints are inherently stable due to strong ligamentous structures around the talus. The Subtalar dislocations are classified according to the direction of the foot relative to the talus. There are three broad types of subtalar dislocations, medial, lateral & posterior subtalar dislocations. Anterior subtype was added later. Medial subtalar dislocations are much more common. They occur due to low energy trauma and have good outcomes. Lateral subtalar dislocations are rare injuries occurring due to high energy trauma and have guarded functional outcomes.¹ Anatomical reduction and stabilization of subtalar joint is of paramount importance along with treatment of associated foot injuries to achieve good functional outcomes but do not necessarily prevent arthritis.² In complex injuries like subtalar joint dislocation associated with ipsilateral femur fracture closed anatomical reduction becomes extremely challenging.

CASE REPORT

This study presents a rare case of 2 days old subtalar dislocation with ipsilateral femur shaft fracture and multiple metatarsal base fracture.

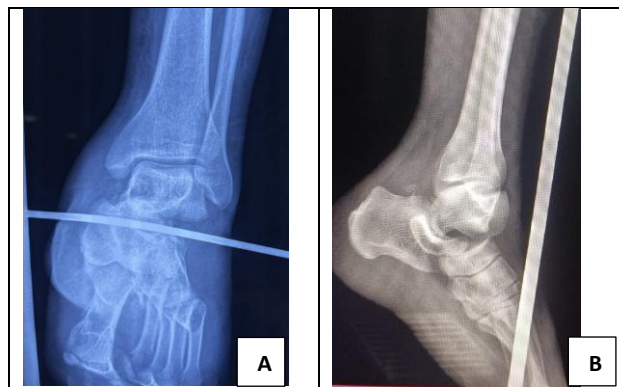


Figure 1 (A and B): AP and Lateral X- rays of ankle joint showing medial subtalar dislocation with 2,4 and 5 metatarsal bases fracture.

A 24-year-old man referred 2 days after alleged H/O RTA with complaints of inability to move his left thigh and left foot. After ATLS protocol with primary and secondary survey he was found to be hemodynamically stable. On examination the patient had thigh swelling with abnormal mobility and substantial ipsilateral foot swelling just below ankle. Femur stabilized using Thomas splint. He was subjected to radiographic examination which revealed shaft of femur fracture left along with left side medial subtalar joint dislocation and 2,4,5 metatarsal bases fracture (Figure 1).

He was planned for closed reduction and stabilization of subtalar joint dislocation and reamed intramedullary nailing of left femur.

The standard procedure for closed reduction needs ipsilateral knee and hip are flexed 90 degrees to relax gastrocnemius, mild traction is given at heel, dorsiflexion and eversion reduces the joint (Charnley method) (Figure 2).



Figure 2: Charnley method of closed reduction of subtalar dislocation with flexion of hip and knee to relax gastrocnemius.

But this particular case was complicated by ipsilateral femur shaft fracture which made knee and hip flexion problematic and the 2 days old swelling of foot made closed manipulation difficult. The patient was given standard Ankle block to relax muscles and ease manipulation.

To facilitate knee flexion to relax gastrocnemius with ipsilateral femur fracture, the patient's thigh was supported with temporary splint upto just above popliteal crease and patient was brought to edge of bed and his leg was made to hang down from the edge of bed. Knee flexion was achieved as such with femur stabilized. Then the surgeon sat on the floor holding foot and ankle with the assistant holding the leg for stability (Figure 3).

After 1 attempted failed closed reduction, closed reduction was successfully achieved in the 2nd attempt. Post reduction distal neurovascular status checked and below knee slab applied and thomas splint reapplied. Metatarsal fractures were treated conservatively.



Figure 3: Pictorial representation of how subtalar joint reduction achieved with stabilizing femur fracture.

CT scan was done to rule out any osteochondral fractures and to confirm anatomical reduction. He was then treated for shaft of femur fracture with intramedullary nail of femur.

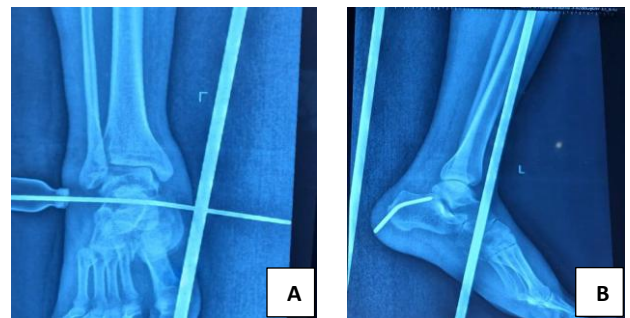


Figure 4 (A and B): Post reduction x-rays showing subtalar joint in alignment.

The patient was started on knee ROM Exercises immediate post-op and partial weight bearing in 4 weeks with below knee slab removed and full weight bearing done in 6 weeks. The patient completely recovered by 3 months.

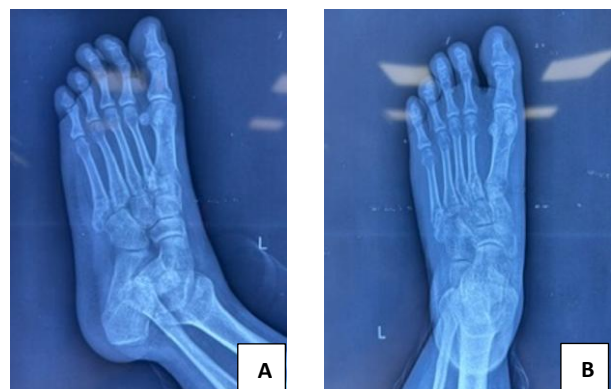


Figure 5 (A and B): Follow up x-rays at 3 months showing maintained reduction at subtalar joint and callus formation at metatarsal based.

Post reduction treatment

Closed anatomical reduction alone does not guarantee stability to the subtalar joint. Immobilization after closed reduction can be achieved by a below knee splint or brace. In case of marked instability of the subtalar joint, Kirschner wire stabilization is necessary. A CT scan must be done post reduction to assess the congruency of the joint, accuracy of reduction and detect associated fractures that might require surgical treatment.

For stable dislocations, full weight bearing can be permitted with below knee cast or walker boot which is maintained for 6 weeks. For unstable dislocations which are maintained with Kirschner wires, K wires may be removed after 4 weeks, and then partial weight bearing can be permitted as tolerated.

DISCUSSION

Subtalar joint dislocations are rare injuries that account for about 1% of total dislocations. Hence the available literature of these dislocations and the associated injuries are also less in number. These are uncommon injuries that involve disruption of talocalcaneal and talonavicular joints.³ Medial subtalar joint dislocations are caused by low grade injuries whereas lateral subtalar joint dislocations are caused by high energy trauma, associated foot injuries and warrants open reduction in majority of the cases. The stability of the subtalar joint is dependent on ligamentous structures surrounding them. Forceful inversion, eversion or extreme plantar flexion results in ligamentous failure and displacement of calcaneus and navicular. Patients with ligamentous insufficiency, malleolar hypoplasia are at increased risk of sustaining subtalar dislocation.⁵ In cases where there is a gross dislocation, there is visible deformity with skin tensioning on the opposing side. The amount of force required results in substantial skin defect on the tension side of the wound thus creating an open subtalar dislocation.

Broca et al in his study, described the classification for subtalar joint dislocations. He described lateral, medial and posterior dislocations of calcaneus and foot from beneath the talus initially and later added the rare type - anterior dislocation. He also stated that medial subtalar joint dislocations occur because of forceful inversion of the forefoot in a plantar flexed position which in turn loads the lateral side ligaments thus resulting in rupture of talocalcaneal, talonavicular ligaments and pivoting of the talus on the sustentaculum tali of the calcaneus. Lateral dislocations were caused by traumatic eversion of the foot and posterior dislocation by forceful plantar flexion alone.⁵ These dislocations are most commonly caused by RTA >Fall from height and Men are most commonly affected than women.

Charnley method of closed reduction is the most commonly used method in ankle and subtalar dislocations. The patient is made to lie supine with knee flexed to 90

degree to relax the gastro-soleus complex & the surgeon gives longitudinal traction to the foot from the heel while an assistant stabilises the leg. The deformity is first exaggerated then reduced. This is the widely followed method but may lead to unwanted complications on the soft tissues and neurovascular structures due to traction. Post reduction most commonly a Below knee slab is given

In case of unstable injuries, the joint can be stabilized by Kirschner wire post reduction

Grear et al described complications following subtalar joint dislocations. They stated that post traumatic arthritis was noted in 80% of the patients in talonavicular & talocalcaneal joints. A late complication described was osteonecrosis of the talus. Kou et al described that subtalar joint stiffness was commonly observed because of fibrosis of the joint capsule following injury. Recent evidence points towards early range of motion of the involved joints after the initial injury to prevent stiffness.^{6,7}



Figure 6: Patient at 3 months follow up showing full weight bearing.

CONCLUSION

Subtalar dislocations like any other joint dislocation have to be anatomically reduced to restore the mobility. But what makes them notorious is their propensity to progress to arthritis in majority of the cases even in immediate reduction and regular post reduction care. Hence high index of suspicion is required.

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