

SUBTALAR JOINT DISLOCATION

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ABSTRACT

Subtalar dislocations are 'rare' injuries. Although many of these dislocations result from a high-energy injury such as a fall from a height or road traffic accident, a significant number occurs as a result of athletic injuries. Both these cases had medial subtalar dislocations, one of them associated with fracture of the posterior process of the talus. Although this injury pattern is uncommon, but it may be misdiagnosed as "ankle sprains" because of poor visualization on routine ankle radiographs, it is important to recognize the associated fracture as it involves the weight bearing articular surfaces.

INTRODUCTION

Subtalar dislocation (perhaps more appropriately called peritalar dislocation) is the simultaneous dislocation of the distal articulations of the talus at both the talocalcaneal and talonavicular joints. Subtalar dislocations are 'rare' injuries⁽¹⁾. With this injury the tibiotalar joint is undisturbed⁽²⁾, but it may be misdiagnosed as "ankle sprains" because of poor visualization on routine ankle radiographs^(3,4,5). Subtalar dislocation can occur in any direction and always produces significant deformity it is important to recognize the associated fracture as it involves the weight bearing articular surfaces⁽⁶⁾. Most commonly the foot is displaced medially with the calcaneus lying medially, the head of the talus prominent dorsolaterally and the navicular medial and sometimes dorsal to the talar head and neck^(7,8). Less commonly lateral dislocation occurs.

Mechanism of Injury

Inversion injury of the foot results in a medial subtalar dislocation, while eversion produces a lateral subtalar dislocation. The strong calcaneonavicular ligament resists disruption, and the inversion or eversion force is dissipated through the weaker talonavicular and talocalcaneal ligaments, disrupting these two joints and allowing displacement of the calcaneus, navicular, and all distal bones of the foot as a unit, either medially or laterally. With a medial subtalar dislocation the sustentaculum tali acts as a fulcrum about which the foot rotates to lever apart the talus and calcaneus.

Frequently associated fractures occur in the ankle and foot. Shearing osteochondral fracture from the dislocated articular surfaces of the talonavicular or talocalcaneal joint occur in up to 45% of patients and difficult to identify on routine x-ray even after the reduction of the dislocation. Other bones that are commonly fractured are both malleoli, the base of the 5th metatarsal, the cuboid, and the navicular tuberosity.

Signs and Symptoms

Significant deformities are present in all cases of subtalar dislocation. Because of the significant amount of displacement of the foot on the talus, and particularly with high energy injuries, between 10%-40% of these injuries are open and in all closed dislocations there is significant distortion of the soft tissues and tenting of the skin over the prominent talar head. Significant swelling occurs soon after the injury and this swelling may mask the bony deformity.

In cases of chronic subluxations patients can walk almost normally but they can no longer perform jumps. Their major complaint is that 'something is wrong with their foot, sometimes along with reported soreness & increasing pain in their Achilles tendons⁽⁹⁾.

Clinical Examination

In the acute phase, palpation of the talonavicular, anterior fibulotalar and tibiotalar ligaments is painful, as is palpation and mobilization of the midtarsal (Chopart's) joint.

Mobilization of the ankle joint in flexion/extension and varus/valgus causes pain. A slight and painful limitation of the ankle extension is noticeable. Subtalar hypo mobility is clearly observed in comparison with the contralateral side. After a few hours, tenderness & swelling appear at the talonavicular joint and at the posterior part of the ankle.

In cases of chronic subluxation, the patient's symptoms and clinical examination are dominated by an acute Achilles tendonitis, which often obscures underlying subtalar joint derangement⁽⁹⁾.

Radiologic Assessment

A clear view with standard AP, lateral and oblique x-rays of the foot is difficult to obtain because of the distortion of the foot and frequently inadequate x-rays are taken leading to a delay/error in diagnosis. AP view shows talonavicular dislocation. In the lateral projection close inspection usually reveals the head of the talus lying superior to the acicular or cuboids in the medial subtalar dislocation and the taller head appear to be displaced inferiorly in a lateral dislocation. Associated fractures are not uncommon.

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Treatment

The keystone of treatment for all subtalar dislocations is prompt and gentle reduction under general or spinal anesthesia. Subtalar dislocations without fractures should be reduced closely whenever possible. Closed reduction is usually accompanied by a satisfying snap or clunk as the joints reduce and on clinical examination the adequacy of reduction is demonstrated by the normal alignment of the foot and normal, stable range of motion (ROM) of the subtalar and midtarsal joints. After closed reduction and the dislocation is stable, it should be immobilized initially in a short leg posterior plaster splint for 4 weeks to allow healing of soft tissues. This should be followed by progressive weight bearing and active ROM exercises for both the ankle and subtalar joints to restore motion, particularly subtalar motion. If an anatomical reduction cannot be achieved by closed means, then a prompt surgical reduction should be undertaken through a dorsal approach, usually over the prominent talar head. Small fracture fragments should be debrided from the joints while large fragments should be anatomically reduced and rigidly fixed. Once the block to reduction is removed the reduction is usually stable; prolonged periods of immobilization should be avoided to prevent persistent joint stiffness.

CONCLUSION

Subtalar dislocations, although not common, have been increasing in frequency over the last decade. The high frequency of medial displacement is explained by the fact that the subtalar joint is only unstable in inversion. The lateral displacement is rare. The prognosis is good in pure dislocation⁽¹⁾. The majority of patients will suffer minimal disability, with subtalar joint stiffness as the primary complaint⁽¹⁰⁾. The mechanism of injury is an important factor in predicting long term results. The results are worse with the more violent mechanisms.

Simple inversion rarely produces a dislocation with long term morbidity while more violent injuries e.g. those incurred in motor-vehicle accidents or during a fall from a height are more likely associated with persistent symptoms. These violent injuries are more likely to produce associated fractures and more severe soft tissue injury, both of which decrease the chances of a good long term result.

Case 1

A 53 years old civil teacher by profession with history of fall down from height (2 meters). He sustained an inversion type injury of the right foot, presented to us in the casualty department after about 2 hours complaining of right foot severe pain and deformity. On examination (O/E) there was significant distortion of the soft tissues and tenting of the skin over the prominent talar head. The pain was localized to the midtarsal area. On palpation a sharp pain was felt at the midtarsal and posterolateral joints. Sub-

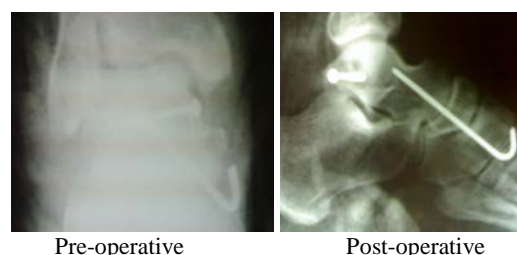
talar joint motions were clearly reduced significantly compared with the contralateral side. Ankle extension was limited and painful. Clinically there was no neurological or vascular deficit.



X-ray reveals medial subtalar dislocation with Osteochondral fracture of posteromedial margin of the talus which is entrapped between talus and the medial Malleolus.

Under general anesthesia, aseptic technique and through medial approach of the ankle, fixation of a large piece of osteochondral fracture from the posteromedial aspect of the talar dome was done with malleolar screw (30mm length), reduction for the subtalar joint was done, but it was unstable, so, retrograde K-wire inserted through the navicular bone to the talus.

The K-wire was removed after 4 weeks & the patient allowed starting weight bearing after another 8 weeks.



Pre-operative

Post-operative

Case 2

A 56 years old man with history of road traffic accident (pedestrian), had a run over type of injury, pre-

sented to us in the casualty department with right foot pain & deformity.



O/E there was swelling in the lateral malleolar and midtarsal area more towards the lateral aspect. Movements were reduced considerably at the subtalar joint. No neurological or vascular deficit was elicited clinically.

X-rays reveals medial type subtalar joint dislocation. Under general anesthesia closed reduction done, but the joint was unstable, so it fixed with retrograde K-wire through the navicular bone to the talus, short posterior leg slab applied, the K-wire and the slab was removed after 4 weeks and the patient allowed to start weight bearing after another 4 weeks.



REFERENCES

- 1- Jarde O,Trinquier-Lautard JL, Mertl P,Tran Van F, Vives P: - 1996: Rev Chir Orthop Reparatrice Appar Mot:82(1):42-48
- 2- Hafez MA, Bawarish MA, Guvvala R : 2000:Closed talar body fracture with talonavicular dislocation-a case report. Foot Ankle Int, Jul:21(7):599-601.

- 3- Letonoff E.J., Najarian CB, Suleiman J.; 2002 The posteromedial process fracture of the talus- a case report. J Foot Ankle Surgery Jan-Feb,41(1):52-6.
- 4- Chen YJ,Hsu R W, Shih H N, Huang TJ: 1996:Fracture of the entire posterior process of talus associated with subtalar dislocation:a case report. Foot Ankle Int. April, 17(4) 226-9.
- 5- Ebrahim NA, Skie MC, Podeszwa DA: 1994: Medial Subtalar dislocation associated with fracture of the posterior process of the talus: a case report. Clin Orthop.Jun,(303) 226-30.
- 6- Naranja RJ Jr.Monaghan BA, Okereke E, William GR Jr.: 1996: Open medial subtalar dislocation associated with fracture of the posterior process of the talus- J Orthop Trauma-10(2): 142-4.
- 7- DeLee, J.C, and Curtis R: 1982: Subtalar Dislocation of the foot. J. Bone Joint Surg, 64A:433-437.
- 8- Heppenstall, R.B, Farahvar H, Balderston R. , Lotke P: 1980.:Evaluation and management of Subtalar Dislocations.J Trauma,20:494-497.
- 9- Jacques M, Daniel Fritschy: 1999. Subtalar Subluxation in Ballet Dancers. American Journal of Sports Medicine. Mar-Apr. Vol 27. No.2.
- 10- Bohay DR,Manoli A: 1996: Occult fractures following subtalar joint injuries. Foot Ankle Int-Mar, 17(3):164-9.