CASE REPORT

Anteromedial subtalar dislocation

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SUMMARY

Subtalar dislocation is the simultaneous dislocation of the talocalcaneal and talonavicular joints of the foot, typically caused by falls from heights, twisting leg injuries and motor vehicle accidents. The dislocation can occur medially, lateral, anterior or posterior, but most commonly occurs from inversion injury producing a medial dislocation. These dislocations may be accompanied by fractures. Careful physical examination must be performed to assess for neurovascular compromise. Most subtalar dislocations can be treated with closed reduction under sedation. However, if the dislocation is associated with an open fracture it may require reduction in the operating room. Treatment should include postreduction plain x-ray and CT scan to evaluate for proper alignment and for fractures. This article presents a case of medial subtalar dislocation in a 23-year-old football player.

BACKGROUND

Subtalar dislocations can happen on the playing field or in accidents such as falls or motor vehicle accidents. Providers must be familiar with the recognition and treatment of these injuries in order to limit damage to the articular surfaces of the ankle from improper diagnosis or failed attempts at reduction. This case highlights the imaging needed to make the correct diagnosis, the proper reduction techniques and postreduction care that providers should be familiar with.

CASE PRESENTATION

A 23-year-old NCAA Division I football player sustained an inversion injury to his right ankle during practice. This injury occurred during a non-contact drill and he was unable to bear weight following this injury. On the field, the initial examination showed an obvious ankle deformity that could not be reduced. Neurovascularly the player was intact. The player was transported to the emergency department for further management.

He presented to the emergency department with pain, swelling and an obvious medial dislocation of the foot/ankle. Physical examination revealed medial dislocation, without neurovascular compromise. Dorsalis pedis pulses were 2+ and he had less than 2 s capillary refill. He had no lacerations of the skin. He had decreased sensation on the lateral side of the foot.

His medical and surgical history was unremarkable. He had no prior injuries to this ankle.

INVESTIGATIONS

Conventional (or plain) radiographs taken in the emergency department revealed a medial subtalar dislocation of the foot without apparent fracture.

DIFFERENTIAL DIAGNOSIS

- ▶ Subtalar dislocation
- ▶ Talar ankle dislocation
- ▶ Ankle fracture
- ▶ Lateral ankle sprain
- ▶ High ankle sprain

TREATMENT

Initial reduction techniques, using an intra-articular block of lidocaine, were unsuccessful and the patient required conscious sedation prior to this reduction. The patient's knee was placed in the flexed position to relax the calf muscles, longitudinal foot traction was applied with counter-traction of the leg combined with initial accentuation of the deformity (medial in this case), and reversal of the deformity (eversion) resulted in successful reduction. Postreduction radiographs did not show a fracture and a CT scan was performed that showed normal alignment and no fractures. The patient was immobilised with a posterior splint with the ankle at 90°.

OUTCOME AND FOLLOW-UP

The patient was placed in a walking cast. He began partial weight bearing at 3 weeks and continued this until he reached the 4-week point when the cast was removed. Physical therapy was started that focussed on regaining strength and range of motion. He recovered well with this treatment and returned to complete the last 3 weeks of the college football season. He continued to have pain and swelling after the season and an MRI of the ankle showed chondral defects in the subtalar joint and a partial deltoid ligament tear. He underwent arthroscopic surgery with debridement and microfracture. Postoperatively he was pain free and was able to participate the next season without restrictions. He reported no problems with his ankle 3 years after his initial injury.

DISCUSSION

The first report of a subtalar dislocation was described by Judey and Defaurest in 1811. This injury involves either an isolated dislocation of the subtalar and talonavicular joints, or a dislocation associated with fractures of the talar, calcaneal or navicular bones.¹ Overall, subtalar dislocations are uncommon, accounting for approximately 1% of all dislocations, and only 15% of all talar injuries.² The injury is caused by the application of a high-energy force, such as that found in a motor vehicle accident and falls from a significant height.³

Medial, lateral, anterior and posterior dislocations are all possible, with medial and lateral dislocations being the most common.³ Medial dislocations (also called basketball foot) are produced

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Figure 1 Photo and x-ray of the left ankle that has a medial subtalar dislocation.

by an inversion force and account for about 80% of subtalar dislocations. Lateral dislocations which account for about 15% of subtalar dislocations are due to eversion injuries.^{1 4}

Inversion or eversion forces applied to foot during an accident or fall cause disruption of the talonavicular and talocalcaneal ligaments. The calcaneonavicular ligament is strong and resists disruption. The inversion/eversion force causes displacement of the calcaneous, navicular and distal bones to be dislocated medially or laterally as a unit.⁵

The patient typically presents with severe ankle/foot pain along with an obvious hind foot deformity. Although less common than a typical talar ankle dislocation, it is important to sufficiently evaluate these patients and confirm that the dislocation is within the subtalar and not the ankle joint. Physical examination should include documentation of any open injuries, and a careful neurological and vascular examination of the affected extremity.⁶ Radiographs of the foot and ankle in orthogonal views can help confirm the diagnosis; and a CT scan should be ordered to evaluate for fracture. A medial dislocation without fracture can be treated with closed reduction to allow for decompression of neurovascular structures. This is accomplished by flexing the knee in order to relax the gastrocnemius muscle, while longitudinal traction is applied through the foot. Again, proper identification of subtalar versus classic ankle dislocation needs to be made as the reduction techniques can be very different for these two different dislocations. Repeat x-ray should always be obtained to verify proper reduction and the presence or absence of fracture (figure 1).⁵

Lateral dislocations, however, are frequently irreducible by closed manipulation. This is often because of the tibialis posterior tendon and/or an osteochondral fracture of the talus, both of which can block reduction.² Subtalar dislocation associated with a fracture is associated with a higher morbidity, and is often treated by open reduction.⁵ In their review of 17 subtalar dislocations, DeLee and Curtis concluded that open reduction and internal fixation or excision of the fragment in cases of fracture might reduce the risk of degenerative arthritis.⁷

Approximately 10% to 40% of subtalar dislocations are open and are not typically reduced in the emergency department.⁸ Once reduced, it is typically left open with delayed primary closure anticipated in 3–5 days, and they frequently require debridement. Appropriate prophylactic antibiotics should be administered and the tetanus status of the patient should be updated.⁵

Postreduction, a CT scan should be considered if plain radiographs are otherwise normal and if the joint remains unstable. Regardless of the method of reduction, the subtalar joint is usually stable after closed or open treatment and does not require internal fixation. Although the injury is stable (unlikely to redislocate), ligament healing requires strict immobilisation. Therefore, it is recommended that the patient be placed in cast. Utilisation of a boot will not be rigid enough and the patient can also remove the boot, which can delay healing.⁷

In the case of a closed injury with no evidence of fracture that is easily reduced, weight bearing can progress slowly for 3–6 weeks until full weight bearing is achieved and the cast is removed.⁹ This is followed by aggressive physical therapy working on ankle's range of motion. Overall, the outcome is favourable for subtalar dislocations.¹⁰ Perugia *et al* reviewed 45 patients with acute closed subtalar dislocations and found that the patients had satisfactory recovery if promptly reduced and immobilised. Most patients will have some degree of stiffness in their subtalar joint, and arthritis often develops over time with this injury.^{9 10}

Learning points

- ▶ Subtalar dislocations need to be correctly diagnosed to limit skin necrosis and damage to articular surfaces from missed diagnosis or improper reduction techniques.
- ▶ Proper imaging will assist in diagnosis and proper management of further possible complications that result from this injury.
- ▶ Pre-reduction and postreduction x-rays are necessary.
- ▶ CT scans should be carried out postreduction to access for subtalar fractures.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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