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Unusual Pure Subtalar Dislocation: Conservative Treatment and 24 Months Follow Up

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Abstract **Case Report**

Acute medial subtalar dislocation without associated fractures is extremely rare, and hardly reported in the literature. Such injuries are more likely to be open and associated with fractures of the surrounding foot bones such as talus, fifth metatarsal or malleoli fractures. A 28-year-old man presented a very rare case of closed medial subtalar dislocation without any related fractures, treated with conservative treatment. Should be consisted of closed reduction with cast immobilization. Closed reduction with early mobilization allowed us to have a satisfactory long term outcome.

Keywords: Subtalar joint, midfoot, dislocation, closed reduction, early mobilization, follow up.

INTRODUCTION

Pure acute subtalar dislocation is a rare injury most commonly caused by high-velocity injury mechanisms; it is a simultaneous dislocation of both the talonavicular and the talocalcaneal joints without a major fracture of the talus. The increased strength of the subtalar joint capsule and surrounding ligaments are the main reasons for the rarity of this injury pattern [1,2].Only few cases have been reported in the literature. Prompt closed reduction of this dislocation is recommended to avoid soft-tissue or neurovascular compromise. A short period of immobilization limits loss of subtalar range of motion [3,4]. However, surgical reduction is inevitable in case of irreducible dislocation.

CASE REPORT

A 28-year-old man presented to the emergency services after a fall when playing basketball, exhibiting a severe pain and deformity in his left ankle. The general physical examination revealed a patient hemodynamically stable without additional injuries. The ankle was fixed in plantar flexion with a significant bony prominence laterally (Fig.1,2). The dorsalis pedis and the posterior tibial pulses were palpable. The radiological examination showed a medial dislocation of both the talonavicular and talocalcaneal joints without associated fractures (Fig.3). Closed reduction under a general anesthesia was performed. In fact, manual foot traction with a firm digital pressure over the talus was applied, then the ankle was dorsiflexed. The reduction was completed with an audible clunk, and the ankle was immobilized in a short leg cast. Post-reduction films showed good realignment and a computed tomography (CT) scan did not reveal any further occult injuries (Fig.4). In the third day, the patient has been mobilized with crutches without weight-bearing. Cast remained for 4 weeks. Passive ankle motion with isometric exercises of the proximal joint was permitted after cast removal. After 4 weeks the patient initiated partial weight-bearing with crutches and full weight-bearing was allowed at 2 months. Then the patient was regularly followed by control radiographs and girth measurements of calf and quadriceps to monitor muscle wastage. After 24 months follow up, the patient was autonomous and active joint motion and full weight-bearing were painless, without instability at the left ankle on joint stress tests.

Fig-1: Lateral view showing an ankle fixed in plantar flexion with a lateral bony prominence.

Fig-2: Superior view of the ankle showing the lateral bony prominence

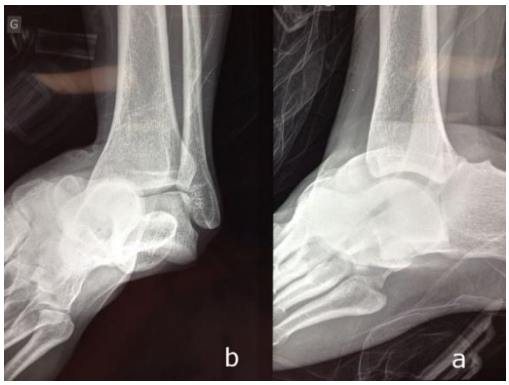

Fig-3: a) Lateral radiograph and b) anteroposterior radiograph showing a medial dislocation of both the talonavicular and talocalcaneal joints without associated fractures.

Fig-4: CT evaluation after reduction showing a good realignment without associated fractures.

DISCUSSION

Subtalar dislocation can be defined as simultaneous dislocation of both the talonavicular and the talocalcaneal joints without a major fracture of the talus [1]. Total dislocation of the talus which includes talocrural dislocation in addition to those of both the talonavicular and the talocalcaneal joints was excluded. Talar neck fractures of Hawkins" types 2, 3 or 4 were also excluded [5]. The acute subtalar dislocation represents < 1–2% of all large joint dislocations and approximately 15% of all talar injuries [6]. The majority of the literature includes subject populations usually numbering fewer than 45 patients collected over 10 –20 year periods. The incidence of injury has been estimated to be 3–10 times more likely to occur in men than women [7].

The medial subtalar dislocation is the most common form (85%) [8], where foot and calcaneus are displaced medially, the head of the talus prominent dorsolaterally, the navicular lies medial and sometimes dorsal to the talar head, however, the neck foot is plantar flexed and supinated. Forced inversion after a fall on inverted foot is a common mechanism (basket ball, foot…) [8]. The entity of a pure isolated subtalar dislocation is extremely rare. The rarity of this injury pattern is probably related to the inherent instability of these dislocations because the talus is balancing between two points, the dorsum of the navicular and the previous facet of the calcaneus [9].

It was reported that subtalar dislocation is the result of violent inversion in medial type and eversion in lateral type, with the sustentaculum tali acting as a fulcrum during the application of this sudden excessive force. Ogiuch [10] in 1974 reported that release of both the interosseous and calcaneofibular ligaments and the capsule of the talonavicular joint were necessary to experimentally create medial subtalar dislocation in amputated limbs. They reported also that releasing both the interosseous and deltoid ligaments and the capsule of the talonavicular joint was necessary to produce lateral dislocation of the subtalar joint. Medial subtalar dislocation occurs more frequently than the lateral form because the lateral talocalcaneal and calcaneofibular ligaments are weaker than deltoid and medial talocalcaneal ligaments.

As much as 80% of subtalar dislocations display restriction in motion after healing, and 50-80% have radiographic evidence of post-traumatic subtalar arthritis [11]. Subsequently those cases successfully treated with closed reduction are placed in a non weight-bearing below knee cast for a maximum of 4 weeks [1], followed by progressive mobilization and rehabilitation. The results of the conservative treatment are reported to be good to excellent. However, complications have been reported, including reduced range of motion, stiffness of the joint, residual instability, osteonecrosis of the talus and early osteoarthritis [12].The capsule of talonavicular joint and extensor digitorum brevis (EDB) may block the reduction, or the talar head may button hole through the EDB. Than open reduction is required. On the medial subtalar dislocation, reduction can be achieved rather easily with manual longitudinal traction even if an avulsion fracture of the malleolus coexists [13]. Since the joint is stable after reduction there is no need for internal fixation [7].

CONCLUSION

Pure medial subtalar dislocation is an uncommon injury. Conservative treatment could be a choice option in cases where closed reduction would offer sufficient anatomical and functional stability. Post-reduction CT scan is recommended to identify occult fractures, and patients should be monitored closely for post-reduction complications.

Conflicts of interest statement: The authors have no conflicts in interest while working on this project.

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