

Case Report

Medial swivel type dislocation of the talonavicular joint with associated cuboid fracture: a case report

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Received: 24 August 2020

Accepted: 30 September 2020

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ABSTRACT

Medial Swivel-type dislocation are dislocation of talonavicular joint (TNJ) medially and the calcaneus swivels under the talus, with the calcaneocuboid joint intact. This is a rare injury due to the strong network of ligament and tendinous structures. An 11-year-old girl presented after 1 week of injury to the left foot. She had pain, swelling on the mid-foot and inability to weight bearing. X-ray and computerized tomography (CT) scan showed medial dislocation of TNJ, with fracture of cuboid body. A closed reduction was attempted but it failed. Patient then underwent open reduction with K-wire fixation and immobilization by below knee cast for 3 weeks. After K-wire removal, the foot was stable with near normal ankle and sub-talar joint range of motion and patient started to partial weight bearing. Midtarsal dislocations of the foot are rare injuries. In this case dislocation is resulted from high-energy medial forces to the forefoot. The associated cuboid fracture possibly as a result of tensile forces through the lateral structure of midfoot with adduction. 'Swivel dislocation' in which the TNJ dislocates, usually medially, and the calcaneus swivels under the talus, with the calcaneocuboid joint intact. A careful assessment of initial radiograph and CT scan should be done to determine type of dislocation and associated fracture. An open reduction K-wire fixation bring a stable reduction. Talonavicular dislocations are rare injuries, occur as a result of high-energy trauma. A stable reduction and good outcome are anticipated.

Keywords: Medial swivel dislocation, Dislocation of TNJ, Cuboid fracture, Midtarsal dislocations

INTRODUCTION

TNJ dislocation is a rare injury to the foot and ankle due to a strong network of ligaments and tendinous structures. This injury is associated with major trauma and instability that occur across Chopart's Joint. Main and Jowett described an uncommon variant of the dislocation. Swivel type were a medially or laterally directed force dislocates the TNJ, and subluxate but does not dislocate the subtalar joint. The calcaneus rotates or swivels on an intact interosseous talocalcaneal ligament without tearing it.¹⁻⁴

CASE REPORT

An 11-year-old girl presented one week after injury to the left foot. The patient sustained an injury to the left foot after fell down from the stair. The patient recalled that she landed on her left foot in a flexed and inverted position. She was suffering pain, swelling on the mid-foot and inability to weight bearing. Two view of non-weightbearing radiograph were obtained, showed medial dislocation of navicular on the talus (Figure 1 and 2).

A closed reduction was attempted, but post closed reduction radiograph showed unsatisfactory result (Figure 3). Further attempts for closed reduction was not performed. A CT scan then obtained, showed medial dislocation of talonavicular joint and a non-displaced fracture of the cuboid.

The decision then made to perform an open reduction with percutaneous fixation. An antero-medial approach was performed, using interval between tibialis anterior and extensor hallucis longus tendon as a guide, then directed over the dislocation. During operation an interposition of the joint capsule between the talus and navicular was found. The deformity was manually reduced by traction and lateral rotation of the forefoot and two K-wires were driven percutaneously transfixing the TNJ the cuboid fracture was left unfixated since they were non displaced. It then put in a circular below knee cast for 3 weeks. Follow up radiographs showing congruent talonavicular, sub-talar, and calcaneocuboid joints with k-wires *in situ* (Figure 4).



Figure 1: Anteroposterior radiograph of medial dislocation of TNJ.



Figure 2: Lateral radiograph of dorsal and possible medial dislocation of talonavicular, talocuboid joint still intact.



Figure 3: Post closed reduction radiograph.



Figure 4: Post-operative anteroposterior (A) and lateral (B) radiographs of congruent talonavicular, sub-talar and calcaneocuboid joints with k-wires *in situ*.

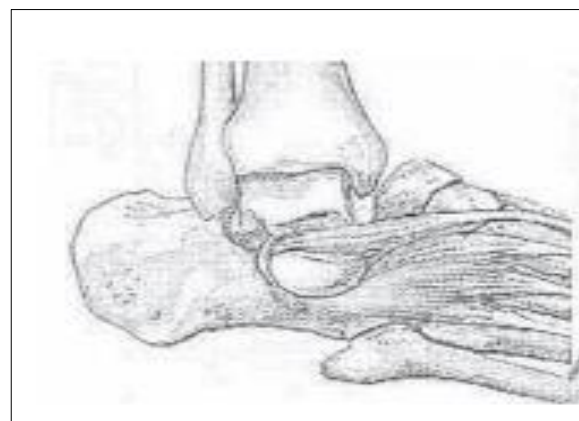


Figure 5: Irreducible medial peritalar dislocation with entrapment of the talar head through the extensor digitorum brevis.

Patient obliged to remain non-weight bearing for 6 weeks, until the time of K-wire removal. After K-wire removal, the foot was stable with near normal ankle and sub-talar joint range of motion and patient started to partial weight bearing without any complaints. A

progressive full weight bearing started at 8 weeks. At 12 weeks follow up patient reports no disability to the joint complex on ambulation with only occasional pain. No evidence of avascular necrosis was found.

DISCUSSION

TNJ dislocation is a rare injury of the foot and ankle, usually associated with major trauma. Jowett and main devised a classification scheme based on the direction of force to the foot. Based on radiograph and CT evaluation, the fracture sustained in our case are medial swivel type. Medial dislocations are more frequent than other types of dislocations because of the tendency, in a fall from height, to land with plantar flexion and inversion of the ankle.¹

In the evaluation of such injuries, an important factor to consider is the mechanism of injury/deforming force. The prevalence of concomitant injury with TNJ dislocations is quite high, in upwards of 75-90%. As in the patient also sustained cuboid fractures. It was felt that these injuries did not need to be fixated since they were non-displaced. Ip and Lui suggests that concomitant ligamentous injury carries a worse prognosis than coexisting fractures alone.⁵

According to Richter et al Chopart joint dislocation was stratified into four categories based on its treatment: closed reduction, no internal fixation; closed reduction with internal fixation; open reduction, internal fixation, optional additional external fixation; amputation.⁶

Swivel type injuries are associated with fewer complications than pure dorsal dislocations due to a lesser degree of ligamentous structure involvement and preservation of plantar ligament integrity.^{3,7}

The dislocation manually reduced by traction followed with lateral rotation of forefoot that reduced foot back into its position. Very few attempts should be made at closed reduction because this can compromise the surrounding tissues and eventually lead to the necrosis.^{7,8}

The most common causes of irreducibility for medial dislocations are: 1) button-holing of the talar head through the extensor retinaculum or extensor digitorum brevis, 2) interposition of the extensor digitorum brevis between the talus and navicular, 3) impingement by bony fragments, 4) spiking of the lateral corner of the navicular bone into the upper medial part of the head of the talus, 5) button-holing of the talar head through the talonavicular ligament and joint capsule and rarely, 6) impingement of the deep peroneal nerve and dorsalis pedis artery (Figure 5).⁸

If proper reduction was unable to obtain, an open reduction should be performed. Further considerations in treatment are timing of injury to presentation,

neurovascular deficit, integrity of the soft tissue envelope and proper imaging. The ability of the patient to remain non-weightbearing on the foot is essential for a good outcome.^{1,9,10}

CONCLUSION

Talonavicular dislocations are rare injuries, which usually occur as a result of high-energy mechanisms. The case describes a medial swivel type dislocation injury, together with an associated cuboid body fracture. An open reduction and percutaneous fixation provided good outcome in this patient.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Astawa NMPD, Aryana IGW, Maharjana MA, Simanjuntak HA, Stanu GNP, Purvance I, Putra IGM. Medial swivel type dislocation of the talonavicular joint with associated cuboid fracture: a case report. *Int J Res Med Sci* 2020;8:4162-4.