

Swivel Subtype of Talonavicular Joint Dislocation of Foot: A Rare Occurrence

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Abstract

Dislocation of the talo-navicular joint is a rare occurrence. The swivel subtype dislocation is reported throughout the literature. Most are the result of an abductory or adductory force applied to the forefoot. This region is usually resistant to injury because of the strong ligamentous structures around the midtarsal joint. The strongest ligamentous structures of the midtarsal joint are on the plantar side which is protected by the long and short plantar ligament, bifurcate ligament, and the plantar calcaneonavicular (spring) ligament, which are important as supports for the arch of the foot¹.

Therefore, dorsal mid tarsal dislocation resulting from disruption of these plantar ligaments is less common than other types of mid tarsal dislocation. Kennedy reported a case of navicular fracture dislocation which, by the description of the incident and the reduction maneuver employed, suggests that plantar flexion combined with inversion were the forces required to produce the deformity. He also concluded that understanding of the mechanism of injury in these fractures may lead to easier closed reduction and improved outcome²

A subtype pattern of injury is the swivel dislocation at the talo-navicular joint. A medial or lateral directed force to forefoot can result in a swivel dislocation at the talo-navicular joint.

Keywords: Talonavicular joint, bifurcate ligament, calcaneo navicular ligament

INTRODUCTION

We are presenting a case of pure talonavicular joint dislocation with out dislocation or fracture of other tarsal bones or calcaneum and is very rare. This variant of subtalar dislocation was termed as swivel injury by Main and Jowett.

A medially or laterally directed force applied to the foot causes dislocation of the talonavicular joint and subluxation but not the dislocation of the subtalar joint. The calcaneum along with remaining foot swivels on the intact interosseous talocalcaneal ligament causing swivel subtype of dislocation.

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CASE REPORT

A 25 year-old male came to our patient department with history of fall from height injuring his right foot. There was diffuse swelling, and tenderness; crepitus was felt within the talo-navicular joint. Physical examination revealed an obvious deformity with lateral displacement of the foot on the head of talus,. The skin overlying the talar head on the medial foot was taut. There was no neurovascular deficit. Anteroposterior and oblique radiographs showed a complex talo-navicular dislocation. Close reduction was tried under conscious anaesthesia but it failed and then the open reduction of the talo-navicular dislocation was performed under spinal anaesthesia. Anteromedial longitudinal incision was given, centred over talonavicular joint. Extensor hallucis longus tendon and dorsalis pedis artery was retracted medially and extensor digitorum longus tendons were retracted laterally. Talonavicular joint was exposed and reduced by traction and lateral rotation of forefoot and stabilized by two Percutaneous K-wires using image intensifier. The post operative period went uneventful. Wound dehiscence occurred and there was superficial infection which was treated with serial dressing and antibiotics, the patient was immobilized in a plaster of paris cast for six weeks. Gradual physiotherapy was performed to the ankle and foot.

The cast and surgical pins were removed after six weeks. Tolerable weight bearing ambulation began at eight weeks. The patient made a quick recovery and was allowed to fully weight bear at twelve weeks.

He returned to his previous job without incident and no long term complication was identified. After a 1 year follow-up, no complications were reported. This patient is still successfully employed as a manual worker performing normal activities

DISCUSSION

Midtarsal joints, including the talo-navicular and calcaneocuboid joints, are functionally related to the subtalar and Lisfranc joints. TNJ dislocation is a rare injury of the foot and ankle with most cases reported occurring after major trauma. Medial TNJ dislocation, like the one described, are among the more common types of deformity occurring at the TNJ after trauma with a prevalence of 30%⁴. Main and Jowett classified a series of 71 midtarsal joint injuries into 5 groups according to the direction of the deforming force and the resulting displacement: medial forces, longitudinal forces, lateral forces, plantar forces, and crush injury³. Only two cases of midtarsal dislocation were reported: pure plantar midtarsal dislocation and plantar subtalar dislocation associated with plantar dislocation of the talo-navicular joint caused by a plantar force. Cases of isolated midtarsal dislocation in medial, lateral, or plantar directions have been reported⁵⁻⁸. The combination of dorsal dislocation of the navicular from the talus and an associated comminuted fracture of the calcaneus (transcalcaneal, talo-navicular dislocation) is an unusual and severe injury and six cases have been described previously⁹.

A swivel dislocation is an uncommon variant of a subtalar dislocation, where a medially or laterally directed force dislocates the talo-navicular joint, and subluxates but does not dislocate the subtalar joint. The calcaneus rotates or swivels on an intact interosseous talocalcaneal ligament without tearing it.

Main and Jowett described this dislocation type injury occurring at the midtarsal joints with a classification system to help the physician decide the best course of treatment³

Direction of Deforming Force	Resulting displacement/Deformity	Prognosis
Medial	Fracture-Sprains, fracture-subluxation/dislocation and swivel	Good
Longitudinal	Undisplaced fractures of the navicular, displaced fractures of the navicular, crushing injuries to the navicular, cuneiforms and talus.	Lateral longitudinal: poor Medial Longitudinal: good
Lateral	Fracture-sprains, fracture-subluxations and swivel	Poor
Plantar	Fracture-sprains and fracture-subluxation/dislocations	
Crush	No constant pattern of injury	Variable
Dorsal	None described	

It is important to recognize this injury as the treatment and prognosis are different from a subtalar dislocation¹⁰. Even in these complex injuries, an early anatomic reduction and stable fixation can minimize the percentage of long-term impairment¹¹⁻¹². Open reduction and internal fixation gives a better outcome allowing repair of the plantar ligamentous structures, especially the plantar calcaneonavicular or Spring ligament. This improves the stability of the talo-navicular joint, which is critical to normal foot biomechanics. Primary fusion of the talo-navicular joint after fracture dislocation of the navicular bone is also described.

CONCLUSION

Complex talo-navicular dislocation is rare especially swivel type. It represents a severe injury to the plantar ligamentous structures. An early anatomic reduction, stable fixation and immobilization can minimize the long-term impairment and complications.

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