Acute Isolated Dorsal Midtarsal (Chopart's) Dislocation: A Case Report

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Isolated midtarsal (Chopart's) joint dislocations are rare, although cases involving medial, lateral, plantar, and dorsal displacement have been reported. These dislocations are often associated with osteochondral fractures. To the best of our knowledge, isolated dorsal midtarsal dislocation owing to plantarflexion of the forefoot on the hindfoot with the ankle in a neutral or dorsiflexed position is rare. In this article, we describe a case of isolated Chopart's dorsal dislocation and discuss the mechanism of injury, management, and outcome. The patient was treated with open reduction and repair of ligamentous structures, and Kirschner wire transfixation. At approximately 96 weeks following treatment, the patient was walking without aid, despite the development of posttraumatic degenerative changes at the calcaneocuboid joint. In retrospect, primary arthrodesis of the calcaneocuboid joint may have been more beneficial for the patient. We also describe the unusual mechanism whereby a plantarflexory force applied to the forefoot, without ankle plantarflexion, results in dorsal dislocation of the midtarsal joint. Level of Clinical Evidence: 4 (The Journal of Foot & Ankle Surgery 48(4):462–465, 2009)

Key Words: calcaneocuboid, foot, injury, joint, ligament, midtarsal, surgery, talonavicular

The midtarsal joint (MTJ) is composed of the talonavicular and calcaneocuboid joints, and is also know as Chopart's joint. Isolated MTJ injury is uncommon owing to the close proximity of the adjacent subtalar and Lisfranc joints, and because the amount of force required to cause ligamentous disruption often results in multiple fracture/dislocations, and the Lisfranc or subtalar joints usually fail first (1). Cases of isolated midtarsal dislocation in the medial, lateral, plantar, and dorsal directions have been reported (1–6); however, to the best of our knowledge, isolated dorsal midtarsal dislocation as a result of plantarflexion of the forefoot on the dorsiflexed hindfoot has heretofore not been reported in the biomedical literature.

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Case Report

A 35-year-old woman fell 6 feet from a wall and landed on her feet, with the right forefoot plantarflexed on the hindfoot, resulting in immediate pain. She was initially treated with below-the-knee plaster splint immobilization and nonsteroidal anti-inflammatory analgesics. The patient was referred to Government Medical College, Calicut, and was subsequently evaluated approximately 4 hours after the injury. The patient had no other injuries and radiographs (Figure 1) of the right foot, after removing the plaster splint, showed isolated dorsal dislocation of the talonavicular joint with subluxation of the calcaneocuboid joint. A computerized tomogram (CT) was not obtained.

Based on the degree of disruption of ligamentous structure, and the amount of displacement, it was decided that the best treatment option for this patient was surgical relocation and stabilization of the right foot. Open reduction of the MTJ was thereafter performed under lumbosacral plexus block anesthesia, which was established with the aid of a nerve locator. An anterolateral approach was used to expose the disrupted ligaments and the midtarsal joints (Figures 2 and 3). The talonavicular joint was reduced by means of plantarflexing and inverting the forefoot, followed by relocation of the talar head into anatomical position. This maneuver resulted in complete anatomical realignment of the talonavicular joint, after which a single transfixation Kirschner-wire (K-wire) was used to stabilize the correction, and the distal end of the K-wire was kept external on the lateral aspect of the foot

FIGURE 1 Preoperative oblique radiograph of the right foot showing dislocation of the talonavicular joint and subluxation of the calcaneocuboid joint.

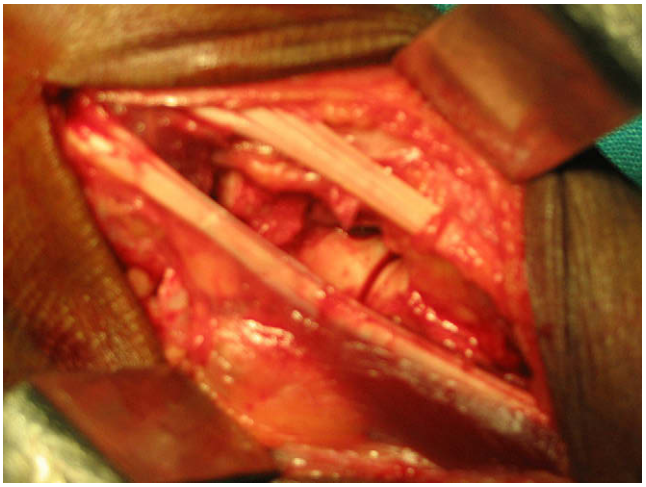

FIGURE 2 Operative photograph showing the plane of surgery between the extensor digitorum longus and the peroneal tendons of the right foot through an anterolateral skin incision.

(Figures 4 and 5). Intraoperative image intensification fluoroscopy then revealed the calcaneocuboid joint to persist to be dislocated, and this portion of the MTJ was then reduced with manipulation that entailed distraction and dorsiflexion of the forefoot on the hindfoot and the plantar calcaneonavicular (spring) ligament; the dorsal calcaneocuboid ligament, as well as the capsular tissues, were repaired using 1-0 polyglycolic acid sutures. Postoperative radiographs, taken with the plaster cast in place, showed complete reduction of the MTJ (Figure 4).

Following the operation, the right foot was immobilized in a short-leg cast for 6 weeks, and the K-wire was removed at the 12-week follow-up visit. The patient had been instructed to remain non–weight bearing on the right foot and to ambulate with the use of crutches up to the 12-week visit following the surgery. Overall, the postoperative course was uneventful with the exception of mild stiffness of the right ankle and foot that subsided with subsequent mobilization. At the 96-week follow-up, the patient had long before returned to normal routine work, but still had right midfoot pain on prolonged standing. Clinical examination at that time revealed tenderness and radiographic evidence of degenerative disease localized to the calcaneocuboid joint.

Discussion

Main and Jowett (2) classified midtarsal (MT) joint injuries into 5 groups, according to the direction of the deforming force and the resulting displacement of the forefoot: (1) medial force with medial displacement, (2) longitudinal force with impaction and twisting, (3) lateral force with lateral displacement, (4) plantar force with plantar displacement, and (5) crush injury. In their series of 71 cases, 2 cases of MTJ dislocation as a result of a plantar-directed force were

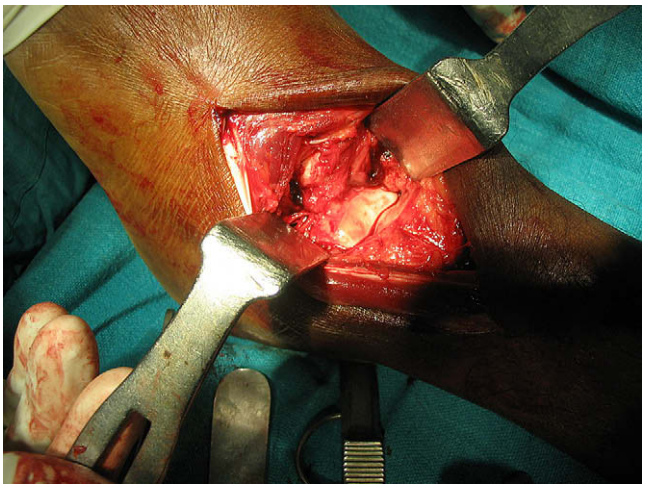

FIGURE 3 Operative photograph showing dorsal dislocation of the navicular over the talus.

reported: a pure plantar midtarsal dislocation and a plantar subtalar dislocation, associated with plantar dislocation of the forefoot on the talonavicular joint. According to Main and Jowett (2), the plantar-directed forces also influence the ankle and result in a number of concomitant injuries, including avulsion fractures of the dorsum of the navicular or talus and the anterior process of the calcaneus, or fracture-subluxations and dislocations with or without impaction at the plantar aspect of the calcaneocuboid joint.

Although Ip and Lui (1) described a case of isolated dorsal dislocation of the MTJ, this injury appears to be much less common than is MTJ dislocation in the medial, lateral, or plantar directions, injuries that have also been previously reported (2–6). In the case described by Ip and Lui (1), interfragmental screw fixation was used to stabilize the