

Isolated dorsal midtarsal (Chopart) dislocation: a case report

KY Ip, TH Lui

Department of Orthopaedics and Traumatology, North District Hospital, Hong Kong

ABSTRACT

A case of isolated dorsal midtarsal (Chopart) dislocation resulting from blunt trauma is reported. The mechanism of injury, management, and long-term outcome are discussed. A 45-year-old inebriated man fell from a 4-m height and landed on his feet. He had immediate bilateral foot and back pain. Radiographs showed a burst fracture of the second lumbar vertebra, a left Pott's fracture, and an isolated dorsal dislocation of the right midtarsal (Chopart) joint. No neurovascular deficits or signs of compartment syndrome were noted. The image intensifier showed the unstable midtarsal joint with dorsal translation of the navicular and cuboid from the talus and calcaneum, respectively. Closed reduction of the midtarsal joint was performed with 2 transfixing 3.5-mm AO cortical screws. The right foot was immobilised in a short leg cast for 6 weeks; screws were removed 14 weeks later. At 76-month follow-up, the patient had returned to work as a construction worker, but still had right midfoot pain on prolonged walking or standing, because of persistent plantar opening up and dorsal ossification of the midtarsal joints and degenerative change at the talonavicular

joint. With hindsight, open reduction may have led to a better outcome through repair of the plantar ligamentous structures, especially the plantar calcaneonavicular (spring) ligament.

Key words: dislocations; tarsal bones

INTRODUCTION

Isolated midtarsal dislocations are rare because of the close proximity of the midtarsal to subtalar and Lisfranc joints. We describe a case of isolated midtarsal (Chopart) dislocation and its clinical outcome.

CASE REPORT

In March 1999, a 45-year-old inebriated man fell from a 4-m height and landed on his feet. He had immediate bilateral foot and back pain and was treated with bilateral short leg casts. The patient was referred to the North District Hospital, Hong Kong, 3 days after the injury. Radiographs showed a burst fracture of the second lumbar vertebra, a left Pott's fracture, and a persistent isolated dorsal dislocation of the right midtarsal (Chopart) joint inside the short leg



Figure 1 (a) Lateral and (b) anteroposterior radiographs showing isolated dorsal midtarsal (Chopart) dislocation of the right foot.

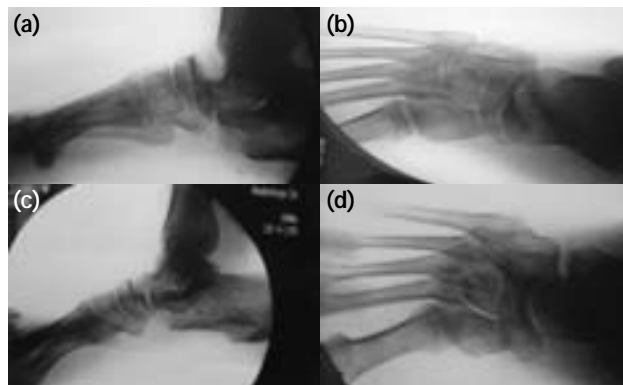


Figure 2 (a) Lateral and (b) anteroposterior radiographs showing the dislocated midtarsal joint. (c) Lateral and (d) anteroposterior radiographs showing the reduced midtarsal joint.

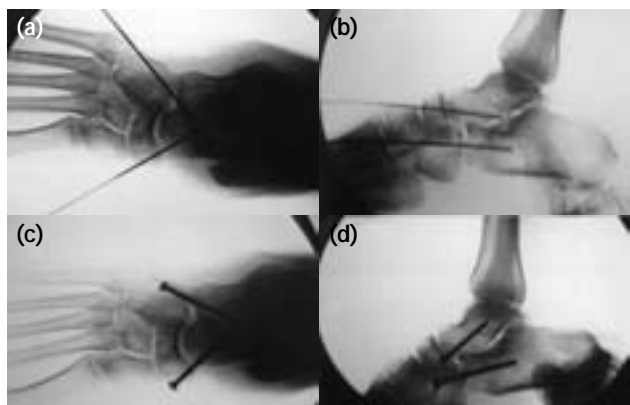


Figure 3 Fluoroscopic images of the right foot: (a) anteroposterior and (b) lateral views of the reduced midtarsal joint temporarily fixed with Kirschner wires, and (c) anteroposterior and (d) lateral views after screw placements.

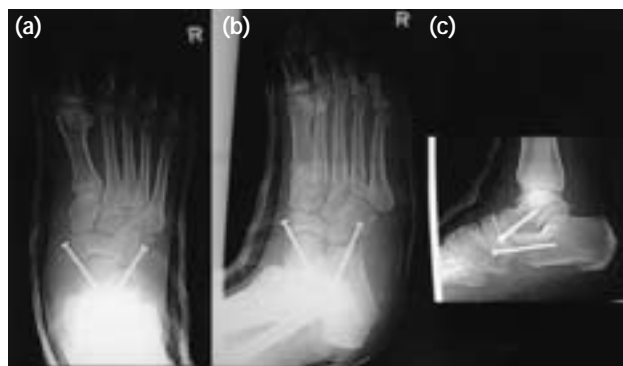


Figure 4 (a) Anterolateral, (b) oblique, and (c) lateral radiographs showing the right foot in a short leg cast.

cast (Fig. 1). No neurovascular deficits or signs of compartment syndrome were noted in the right foot. An open reduction and internal fixation of the left Pott's fracture and the second lumbar vertebral fracture was performed. The right foot was examined under anaesthesia. The image intensifier showed unstable midtarsal joints with dorsal translation of the navicular and cuboid from the talus and calcaneum, respectively. These could be reduced and dislocated easily by plantar and dorsal translation of the forefoot, respectively (Fig. 2). Closed reduction of the midtarsal joints was performed with 2 transfixing 3.5-mm AO cortical screws (Fig. 3). The patient

ambulated in a wheelchair, with the right foot immobilised in a short leg cast (Fig. 4) for 6 weeks; screws were removed 14 weeks later. Weight-bearing radiographs of the right foot showed plantar opening up of the midtarsal joints (Figs. 5a and 5b). Insoles with arch support were therefore given. At 76-month follow-up, the patient had returned to work as a construction worker, but still had right midfoot pain on prolonged walking or standing. Clinical examination revealed tenderness at the talonavicular and calcaneocuboid joints. Radiographs showed persistent plantar opening up and dorsal ossification of the midtarsal joints with degenerative change at the talonavicular joint (Figs. 5c and 5d).

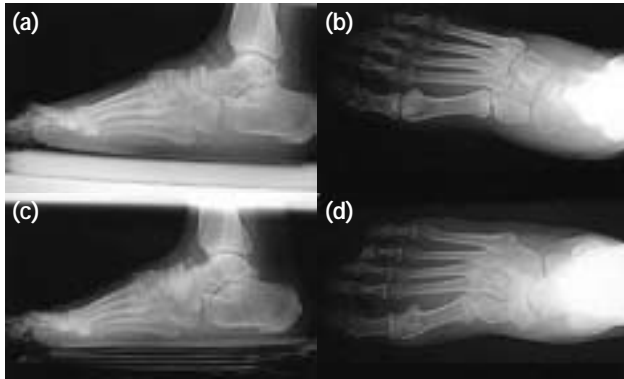


Figure 5 Weight-bearing radiographs of the right foot: (a) lateral and (b) anteroposterior views showing plantar opening up of midtarsal joints immediate after screw removal, and (c) lateral and (d) anteroposterior views showing degenerative change at the talonavicular joint 76 months after screw removal.

DISCUSSION

Midtarsal joints, including the talonavicular and calcaneocuboid joints, are functionally closely related to the subtalar and Lisfranc joints. Isolated midtarsal injury is uncommon. Main and Jowett¹ 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 injury. Only 2 cases of midtarsal dislocation were reported: pure plantar midtarsal dislocation and plantar subtalar dislocation associated with plantar dislocation of the talonavicular joint caused by a plantar force. Cases of isolated midtarsal dislocation in medial, lateral, or plantar directions have been reported.²⁻⁵ In the present case, dorsal forces disrupted the plantar ligamentous structure, resulting in dorsal midtarsal dislocation. To the best of our knowledge, this is the first report of an isolated dorsal midfoot dislocation.

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It is rare 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,⁶ which are important as supports for the arch of the foot. Therefore, dorsal midtarsal dislocation resulting from disruption of these plantar ligaments is less common than other types of midtarsal dislocation.

Early anatomical reduction and stable fixation has been shown to improve the clinical results in other types of midfoot dislocation.^{7,8} In the present case, a closed anatomical reduction was achieved using percutaneous screws to minimise surgical trauma to the soft tissue. The screws were kept in place for a longer period (14 weeks) than that suggested by Richter et al. (6-10 weeks),^{7,8} because considerably more soft tissue was involved. Nonetheless, residual insufficiency of plantar ligamentous structures occurred, resulting in plantar opening up of the joint space. This led to increased compression stress on the dorsal part of the joint, resulting in dorsal ossification. With hindsight, open reduction may have led to a better outcome, allowing repair of the plantar ligamentous structures, especially the plantar calcaneonavicular (spring) ligament. This may have improved the stability of the talonavicular joint, which is critical to normal foot biomechanics.

CONCLUSION

Isolated dorsal midtarsal (Chopart) dislocation is rare. It signifies a severe injury to the plantar ligamentous structures. In the present case, closed reduction and screw fixation resulted in early midtarsal joint subluxation and arthritis, secondary to the residual insufficiency of the plantar ligaments. Open reduction of midtarsal joints, together with repair of ligamentous structures may have improved the clinical outcome.