CASE REPORT

Management of Acute Traumatic Irreducible Metatarsophalangeal Joint Dislocation of the Lesser Toes: A Case Report

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Abstract

Introduction: Irreducible metatarsophalangeal joint dislocations of lesser toes are not very common.

Case description: We report a rare case of a 27-year-old male patient who was injured following a motorbike accident and dislocated his second, third, and fifth metatarsophalangeal joint (MTP) along with a fourth metatarsal neck fracture and same-side femur shaft fracture. The fifth MTP reduction was achieved by the closed method; however, the second and third MTP was not reducible despite multiple attempts at closed reduction. This called for open reduction and stabilization with K-wires.

Clinical significance: This case report depicts the mechanism of injury, clinical signs, and structures preventing close and open reduction techniques through the dorsal approach is reviewed.

Keywords: K-wire, Metatarsophalangeal joint dislocation, Plantar plate.

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Background

The MTP is a very stable joint. Dislocation of the lesser toes is very rare.[1–5] The mechanism of injury is hyperextension force on the MTP joint when the foot is plantar flexed.[4]

These injuries, when associated with other significant skeletal trauma or polytrauma, unconscious patients can be easily missed as the clinical signs can be quite subtle. If not managed properly, it can have a very serious effect on foot biomechanics and weight bearing.[5]

We had a case of acute Irreducible second, third MTP joint dislocation, fifth MTP joint dislocation reduced by the closed method, and fourth metatarsal neck fracture associated with same side femur shaft fracture. The second and third MTP joint had to be reduced by open technique.

Case Description

A 27-year-old male with a history of motor vehicle accidents; while he was riding a two-wheeler hit by another two-wheeler. He presented to our emergency department immediately after the accident. He was conscious and oriented, and all his vital parameters were normal. He complained of severe pain in the right thigh and pain and swelling in the right forefoot. There were no external injuries. There was a marked widening of the first web space with a shortening of the second toe. Movements were painful, with gross swelling of the forefoot. There was no neurovascular disturbance.

Radiological examination revealed a right-side fracture shaft of the femur with dorsal dislocation of the second, third, and fifth MTP joint along with a fourth metatarsal neck fracture (Fig. 1). He was stabilized and shifted to the operation theatre.

Spinal anesthesia was given, and the fifth MTP joint dislocation was reduced with a closed reduction technique which was found to be stable. However, despite multiple attempts, the second and third MTP joint dislocation could not be reduced by the closed method. Femur fracture was fixed first with an intramedullary interlocking nail which was followed by open reduction of the second and third MTP joint.

Through a dorsal approach, longitudinal incisions were given over the second and third MTP joints, respectively. The extensor tendon was retracted laterally. The joint capsule was found to be ruptured. The proximal phalanx base was lying dorsal in relation to the metatarsal head (Fig. 2). The plantar fibrocartilaginous plate was flipped dorsally and wedged between the proximal phalanx base and metatarsal head which is buttonholed through the plantar plate which was preventing the reduction. A short longitudinal incision was made over the plantar plate through which the buttonholed metatarsal head was reduced, and the MTP joint was reduced on both sides and stabilized with K-wire (Figs 3 and 4). The foot was immobilized in a below-knee slab. Ankle range of motion was started at 3 weeks. K-wires were removed at 6 weeks, and gradual weight-bearing was started (Figs 5 and 6).

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Fig. 1: Preoperative X-ray showing MTP joint dislocation of the lesser toes

Fig. 2: Image showing the dorsal dislocation of the second MTP joint

Fig. 3: Postreduction image

Fig. 4: Postreduction image of the second and third MTP joint

Fig. 5: Immediate postoperative X-ray following open reduction

Fig. 6: X-ray at 6 weeks following K-wire removal

Discussion

Irreducible MTP joint dislocation of the lesser toes was first described by Rao and Banson in 1979.[4] Isolated MTP joint dislocation is not frequent; however, only a handful of case reports are available in the literature reporting multiple irreducible MTP joint dislocation associated with other fractures.[3,4]

The MTPs play a vital part in forming the transverse arch of the foot and in plantar flexion immediately before the toe-off stage of the gait cycle.[6] In the MTP joint, the dorsal capsule is very

thin as compared to the plantar capsule, which is thick and dense and forms a fibrocartilaginous structure called a plantar plate. It is attached loosely to the metatarsal neck, but attached tightly to the base of the proximal phalanges. Considerable dorsiflexion force is required at the level of the MTP joint, which happens in vehicular motor accidents, falls from heights, and sports-related injuries. The metatarsal head gets entrapped over the plantar plate or the deep, transverse metatarsal ligament, which causes the buttonhole effect and is the most common cause of Irreducible dislocation.[3]

In our case, we went with the dorsal approach and found the plantar plate to be the impeding structure. A short longitudinal incision was given, and the dorsally dislocated proximal phalanx base was easily reduced over the metacarpal head. The MTP Joint was stabilized with K-wire for 6 weeks which allowed the plantar plate and the surrounding structure to heal to prevent any instability. At 6 weeks, follow-up K-wires were removed, and gradual weight-bearing started. At a 3-month follow-up, the patient was walking normally with no residual pain or deformity.

Conclusion

Multiple irreducible MTP dislocation of the lesser toes associated with other fractures is a rare injury. When associated with other major injuries, this can be easily missed. Careful evaluation of the patient with multiple radiographic views helps in the diagnosis of this injury. Open reduction is the choice of treatment in irreducible dislocation wherein this condition can be easily managed and provide a good outcome.

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