J Orthop Spine Trauma. 2023 September; 9(3): 146-8. DOI: 10.18502/jost.v9i3.13037

Case Report

Open Hallux Interphalangeal Joint Dislocation: A Rare Case

Prem Kumar Kothimbakkam[1], Anantharamakrishnan Ganesh[2,*], Arun Kumar Chandhuru[3], Vijayashankar Murugesan[4]

[1] Associate Professor, Department of Orthopedics, Chettinad Hospital and Research Institute, Kelambakkam, India
[2] Assistant Professor, Department of Orthopedics, Chettinad Hospital and Research Institute, Kelambakkam, India
[3] Assistant Professor, Department of Orthopedics, Indira Medical College and Hospital, Thiruvallur, India
[4] Professor, Department of Orthopedics, Chettinad Hospital and Research Institute, Kelambakkam, India

[*] Corresponding author: Anantharamakrishnan Ganesh; Department of Orthopedics, Chettinad Hospital and Research Institute, Kelambakkam, India. Tel: +98-9595223978, Email: aganesh.anantharaman6@gmail.com

Received: 04 September 2022; **Revised:** 17 November 2022; **Accepted:** 08 December 2022

Abstract

Background: The interphalangeal (IP) joint dislocation of hallux is a rare occurrence probably due to the presence of strong ligamentous attachments around it. Closed reduction of this kind of dislocation proves to be unsatisfactory. Herein, we are presenting a case of an open dorsomedial type of IP joint dislocation following a road traffic accident.

Case Report: A 36-year-old woman with injury to her right great toe following a road traffic accident presented in the casualty of Chettinad Hospital, Kelambakkam, India. On examination, there was a 3 × 2 cm laceration present over the medial-plantar aspect. The bone was exposed. Hallux varus deformity was noted due to the dislocation of the IP joint. The reduction of IP joint dislocation was quite unstable and was fixed with two 1mm Kirschner wires (K-wires) under fluoroscopic guidance. The patient was sequentially followed up on the 4th and 6th weeks post-op. Joint integrity and stability were assessed which were found to be satisfactory after the removal of K-wire on the 6th week post-op.

Conclusion: Open IP dislocations of the hallux Miki type 2 are unstable types of injury to deal with. Closed reduction in these injuries is difficult owing to the impinging sesamoid bone along with other soft tissues. These types of injuries should be reduced and fixed with K-wires to have better stability followed by long-term immobilization of around 3 to 4 weeks.

Keywords: Hallux Interphalangeal Joint Dislocation; Miki Type; Case Study

Citation: Kumar Kothimbakkam P, Ganesh A, Kumar Chandhuru A, Murugesan V. **Open Hallux Interphalangeal Joint Dislocation: A Rare Case.** *J Orthop Spine Trauma* 2023; 9(3): 146-8.

Background

Open hallux interphalangeal joint (HIPJ) dislocation is a somewhat uncommon occurrence. Dorsal dislocation results as a result of hyperextension of the joint. Closed reduction is usually attempted in the emergency setup, but this maneuver is hardly ever successful due to the sesamoid bone's interposition in the interphalangeal (IP) joint area. Closed reductions of the IP joint tried at a delayed setting are usually not effective because of scarring (1).

Here, we present an instance of open dislocation of the HIPJ following a road traffic accident, discussing the mode of the injury, prognosis, and pathoanatomy of such injuries.

Case Report

A 36-year-old woman arrived at the emergency room of Chettinad Hospital and Research Institute, Kelambakkam, India, with an alleged history of a road traffic accident. She had a slip and fall injury from a two-wheeler following which she sustained an injury to her right great toe. There was an open wound exposing the bone and deformity was noted in the right great toe. There were no other injuries noted elsewhere.

On examination, there was a 3 × 2 cm laceration present over the medial-plantar aspect (Figure 1, A-C). The bone was exposed as a result of the laceration on the right great toe. There was a hallux varus deformity noted due to the dislocation of the joint. A wound swab was taken from the laceration following which antibiotic and tetanus toxoid (TT) injection was given. Foot X-rays were ordered, which revealed dorsomedial displacement of the right great toe's distal phalanx (Figure 2, A-B). There was no evidence of fracture around the IP joint.

On trying to reduce the dislocated IP joint, it was very unstable and kept dislocating.

The patient was then planned for wound debridement, reduction and fixation of the IP joint with Kirschner wires (K-wires), and wound closure.

Figure 1. A-C) Clinical picture of the open dislocation of the interphalangeal (IP) joint of the hallux right side

Figure 2. A, B) Anteroposterior and oblique radiographs of the right foot depicting dorsomedial dislocation of the interphalangeal (IP) joint of the hallux of right foot

The IP joint was reduced and fixed with two 1mm K-wires under fluoroscopic guidance (Figure 3, A-B). The reduction was found to be satisfactory and the plaster of Paris (POP) slab was applied.

The procedure was uneventful. Alternate day dressing was done and wound assessment was carried out. The patient was discharged on 13th post-operative day after suture removal.

Figure 3. A, B) Post-reduction anteroposterior and oblique radiographs of the right foot depicting dorsomedial dislocation of the interphalangeal (IP) joint of the hallux of right foot reduced with two 1mm Kirschner wires (K-wires)

The patient came for sequential follow-up at weeks 4 and 6. K-wire removal was done after a follow-up X-ray on the 6th week post-op (Figure 4, A-B). Joint integrity was assessed following the removal of the K-wire and it was found to be satisfactory.

Figure 4. A, B) Anteroposterior and oblique radiographs of the right foot after removal of Kirschner wires (K-wires) at 6 weeks post-op

Discussion

Dislocations typically involve the metatarsophalangeal joint rather than the IP joint because of the strong fixations of the soft tissues around the hallux, which includes the volar plate, the collateral ligament, and the extensor and flexor pollicis longus tendons (2).

Among the IP joint, the most frequent type of joint dislocation is dorsal dislocation. Miki et al. proposed a classification system for dorsal HIPJ dislocations:

Type 1: Sesamoid bone or volar plate interposed in the hallux IP joint

Type 2: Sesamoid bone and volar plate dislocated dorsally on the head of the proximal phalanx of the hallux (3).

As far as we are aware, there have never been any discussions or reports of medial HIPJ. Medial dislocation of the HIPJ is extremely uncommon.

The HIPJ dislocations are less common due to the relative stability of the joint (4) as a result of the proximal phalanx's small lever arm and the strong collateral ligaments. The reasons for the rarity of lateral or medial dislocations are the strength of the collateral ligaments and the adjacent toe's mechanical support.

For dorsal dislocation of the HIPJ, most articles advise closed reduction as the main course of treatment. The initial stage is to achieve hyper-dorsiflexion by dorsally dislocating the hallux as described by Yang et al. (5).

With longitudinal traction, the hallux was then bent to the plantar side. If closed reduction fails, then the open reduction is attempted. Plantar (6), plantar medial (7), lateral (8), medial (9), and dorsal techniques can all be used for open reduction. But for medial dislocation, closed reduction is usually difficult and open reduction is better preferred. In our case, the lateral collateral ligaments were found to be disrupted and inspection of the extensor hallucis longus, flexor hallucis longus tendon, and joint cartilage was found to be intact. Temporary fixation of the joint was necessary due to the unstable nature of the dislocation following reduction.

Suwannahoy et al. discussed the challenge faced during the closed reduction of the IP joint dislocation due to the interposition of the plantar capsule with the sesamoid (10).

Leung and Wong have stipulated that on delayed removal of K-wire, chances of recurrent dislocation are rare and the long-term prognosis appears to be excellent (11).

Conclusion

Open IP dislocations of the hallux Miki type 2 are a rare entity to deal with. Closed reduction in these injuries is difficult owing to the impinging sesamoid bone along with other soft tissues. These types of injuries should be reduced with K-wires to have better stability followed by long-term immobilization of around 3-4 weeks. An excellent outcome is being reported with this treatment protocol.

Conflict of Interest

The authors declare no conflict of interest in this study.

Acknowledgements

Written informed consent was obtained from the patient for this case report.

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