Ch-17
993-17

Journal of Orthopaedic Surgery 1998, 6(2): ~~91-94.~~ 107-110

Dislocation of the medial cuneiform bone in Lisfranc's fracture: A case report

VS Pai
Hastings Memorial Hospital, Hastings, New Zealand.

INTRODUCTION

Fracture-dislocations involving the tarsometatarsal region have been known for many years and are a common injury.[10,15] There are many variations described.[6] The naviculo-cuneiform joint usually remains intact while the metatarsals are displaced. The medial cuneiform bone is rarely dislocated.[6,10] The author presents here a rare instance of complete medial dislocation of the medial cuneiform with associated tarsometatarsal fracture-dislocation.

Key words: *dislocation of the medial cuneiform, Lisfranc's fracture*

CASE REPORT

A 24-year-old man was in a boat which was hit by 2 freak waves in a swell of about 1.5 to 1.8 metres. He was sitting in the stern of the boat on the transom with his feet placed on the floor. The boat cut nicely through the first wave and was travelling at 30 km/hr. At this stage he leaned forward for fear that he might roll over the back. Upon hitting the second wave, the boat almost stopped and his left foot slipped forward and jarred against the tread plate. The forward momentum of his body caused injury to his foot.

Examination revealed a markedly swollen and deformed foot. Palpation elicited a bony prominence over the medial border of the foot just distal to the medial malleolus. There were rotational deformities in the middle 3 toes. Sensation and circulation were intact. Radiological examination (Fig. 1) revealed complex type III Lisfranc's fracture dislocation (divergent displacement). There was complete medial dislocation of the medial cuneiform bone. In addition there were fractures of the neck of the II, III and IV metatarsals. The patient was taken directly to the operating room. A closed reduction was performed under general anaesthesia with fluoroscopic control. Axial traction was applied to the foot and counter pressure was applied over the dislocated medial cuneiform. This manoeuvre obtained complete reduction of the dislocation which was confirmed roentgenographically. Reduction was further stabilised with crossed Kirschner wires. Multiple K-wires were used to fix the tarsometatarsal dislocation and metatarsal fractures (Fig. 2). A plaster back slab was applied, which was converted to a plaster short leg cast after 7 days.

All pins were removed at 6 weeks and the reduction was found to be stable to stress testing under fluoroscopic control. A progressive weight-bearing program was begun. 12 months after injury, the patient was able to resume all of his normal

Address correspondence and reprint requests to: Dr VS Pai, Hastings Memorial Hospital, Hastings, New Zealand.

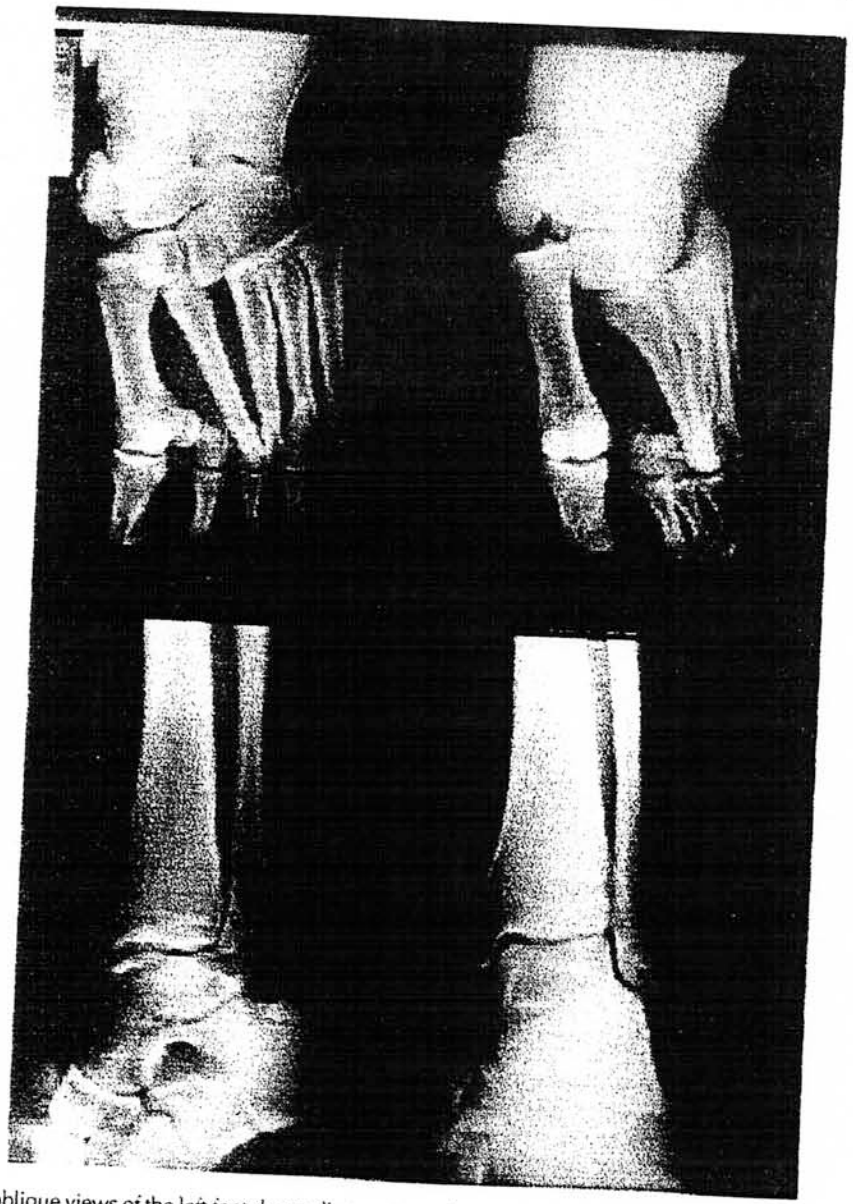

Figure 1 AP and oblique views of the left foot shows divergent type (type C) Lisfranc's fracture. In addition there was complete dislocation of the medial cunieform and fracture of the neck of the II, III, IV metatarsals.

activities without pain, except for some mild swelling after activity. Roentgenograms obtained at this time revealed no evidence of degenerative changes.

DISCUSSION

Injuries to the tarsometatarsal joints may be subtle and easily overlooked or may be quite disruptive with gross clinical and roentgenographic deformity. Hardcastle et al.[5] have published an excellent review of this fracture-dislocation and classified this injury according to the plane of displacement. They identified 3 types of lesions. In type A, there is total incongruity (homolateral displacement), i.e., all metatarsals are displaced medially or laterally at the tarso-metarsal joint. In type B, there is partial incongruity i.e., either medial displacement of the

Figure 2 Roentgenograms after closed reduction and Kirschner wire fixation. No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

first metatarsal or the lateral displacement of lateral 4 metatarsals. In type C injuries, divergent displacement, either complete or partial, occurs with the medial and lateral elements of the forefoot moving away from each other and in different planes. Type C can be associated with fracture of the cunieforms, cuboid, navicular and, very rarely, with dislocation of the medial cunieform.

An isolated dorsomedial dislocation of the first ray through the articulation between the navicular and the medial cuneiform has been described[2,3,5] and has been considered to be a variant of Lisfranc's injury.[7] The present report describes a complete medial dislocation of the medial cuneiform in tarsometatarsal fracture-dislocation. Complete dislocation of the medial cuneiform is an unusual injury and a search of the literature revealed only 3 previous reports of such an injury.[1,4,9]

The bases of adjacent metatarsals are joined by transverse ligaments with one exception: there is no G30 ligamentous connection between the base of the first and second metatarsals. Nevertheless, there is an oblique ligament joining the medial cuneiform to the second metatarsal base. The ligamentous structures around the medial cuneiform are extensive and consist of dorsal and plantar ligaments and the latter are strengthened by slips from the anterior and posterior tibialis tendons and peroneus longus. Because of the strength of these interosseous ligaments, abnormal stress applied to this bone usually results in a fracture of the medial cuneiform rather than a complete dislocation. Wiley[10] described direct and indirect mechanisms of tarsal-metatarsal injury. The indirect is far more common and is produced by violent abduction of the forefoot or plantar-flexion of the forefoot. The complex nature of the fracture in this report suggests that the combination of indirect and direct forces caused a

Delete

rupture of the interosseous ligaments which stabilise the medial cuneiform to the intermediate cuneiform and the medial cuneiform to the base of the second metatarsal. Also some of the plantar ligaments and invertors (tibialis anterior and posterior) forced the medial cuneiform to dislocate medially, which is the anatomical path of least resistance.

Accurate reduction with fixation may improve the outcome but may well be prejudiced by the damage to the articular surfaces at the time of injury. Most Lisfranc injuries can be treated by closed reduction and percutaneous pinning.

ACKNOWLEDGMENTS

The author is grateful to Dr Peter Lloyd, Memorial Hospital, for his help in preparing the manuscript and Mr Wayne Blair, medical photographer, Memorial Hospital.

REFERENCES

1. **Brown DC, McFarland GB.** Dislocation of the medial cuneiform bone in tarsometatarsal fracture: Dislocation. *J Bone Joint Surg* 1975, 57-A:858–9.
2. **Compson JP.** An irreducible medial cuneiform fracture-dislocation. *Injury* 1992, 23:501–2.
3. **Dines DM, Hershon SJ, Smith N, Shelton P.** Isolated dorsomedial dislocation of the first ray at the medial cuneonavicular joint of the foot: A rare injury to the tarsus. *Clin Orthop* 1984, 186:62–4.
4. **Gopal-Krishnan S.** Dislocation of medial cuneiform in injuries of tarsometatarsal joints. *Int Surg* 1973, 58:805–6.
5. **Hardcastle PH, Reschauer, R, Kutsch-Lissberg E, Schoffman W.** Injuries to the tarso-metatarsal joint. *J Bone Joint Surg* 1982, 64-B:349–56.
6. **Holstein A, Joldersma RD.** Dislocation of the first cuneiform in tarsometatarsal fracture-dislocation. *J Bone Joint Surg* 1950, 32-A:419–21.
7. **Lynch JR, Cooperstein LA, DiGioia AM.** Plantar medial subluxation of the medial cuneiform: Case report of an uncommon variant of the Lisfranc. *F Foot Ankle Int* 1995, 16:299–301.
8. **Schiller MG, Ray RD.** Isolated dislocation of the medial cuneiform bone. A rare injury of the tarsus. A case report. *J Bone Joint Surg* 1970, 52-A:1632–6.
9. **Vuori J, Aro HT.** Lisfranc joint injuries: Trauma mechanisms and associated injuries. *J Trauma* 1993, 35:40–45.
10. **Wiley JJ.** The mechanism of tarsometatarsal joint injuries. *J Bone Joint Surg* 1971, 53-B:474–82.