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Case Report

An isolated middle cuneiform dislocation with a rare violence. Case report and literature review

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ABSTRACT

Objective: To report how a case of isolated middle cuneiform dislocation is diagnosed mainly by suspicion and careful imaging.

Clinical presentation and intervention: A 39-year-old male presented with localized foot pain after a sideways compression of the foot on ground. X-rays revealed an empty middle cuneiform site. CT confirmed the finding of an isolated middle cuneiform dislocation. He had operative reduction and stabilization, followed by a good foot function.

Conclusion: The diagnosis of such an injury should be kept in mind in patients while examining the foot injuries in general. Imaging including CT scan of the foot is necessary to confirm the diagnosis and to plan for the surgical treatment. The case was presented to highlight the need to watch out for them and care for them at the earliest.

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1. Introduction

More exposure of the feet to mechanical trauma increases the risk of foot injuries. The same is true with common with manual laborers who also have the habit of barefooted walking. Isolated middle cuneiform dislocations are rare injuries. There have been a few case-reports of dorsal isolated middle cuneiform dislocation. Here we report an isolated dorsal dislocation of the middle cuneiform.

2. Case-report

A 39-year-old gentleman was admitted to our outpatient clinic with complaints of pain in his left foot. He had been stamped on the medial part of his right foot by another person during a fight. At that time his foot was lying with its lateral border touching the ground. His medical history revealed no specific chronic disease. He was a known alcoholic and smoker for past 10 years. He was married and had two children. When he

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Fig. 1 – A painful swelling on the dorsum of the patient's mid-foot and immediately distal to this swelling was an indentation.

Fig. 3 – The patient's left foot X-ray showing the empty cuneiform site.

was admitted to our hospital, his physical examination revealed a tender swelling on the dorsum of the mid-foot. Immediately distal to this swelling was an indentation (Figs. 1 and 2). His antero-posterior view X-ray showed absence of middle cuneiform in its normal site – 'vacant cuneiform' sign in (Fig. 3). A diagnosis of isolated dorsal dislocation of the middle cuneiform was made. A CT scan confirmed that diagnosis (Fig. 4). Under spinal anesthesia a tourniquet was applied in the thigh. A closed reduction which was tried was not successful. Hence a longitudinal incision centering over the swelling was made and proceeded distally up to the base of the second-metatarsal. The extensor hallucis longus tendon was exposed and retracted. The dislocated middle cuneiform was identified. There was proximal soft tissue attachment to the middle cuneiform which was carefully preserved. Distal to the middle cuneiform, its recess was identified. In the distal part of the recess, the base of second metatarsal was seen. In its proximal part the distal end of

Fig. 4 – CT Scan of the patients left foot shows the dorsally dislocated middle cuneiform.

Fig. 2 – Another view of the swelling on the dorsum of the patient's mid-foot.

Fig. 5 – The middle cuneiform recess between the base of second metatarsal distally and navicula proximally is seen.

Fig. 6 – The trial reduction of the dislocated middle cuneiform.

navicula is seen (Fig. 5). The site was cleared of clots and debris. Trial reduction into the cubical void of the middle cuneiform was successful (Fig. 6). Before the final reduction, two cross Kirschner wires were passed into the trough so that it will pass through the middle of the cuneiform on reduction (Fig. 7). The middle cuneiform was reduced into the mortise trough. The above two K-wires were passed into the middle cuneiform. The wound was closed after removal of tourniquet and hemostasis (Fig. 8). A below knee slab was applied. A post operative radiograph shows reduced middle cuneiform with the two cross Kirschner wires (Fig. 9 and 10). A two years follow up showed good foot function as seen from Fig. 11.

3. Discussion

This injury involved the Lisfranc's joint complex, with five bones of the mid-foot – the cuboid, navicular, and three cuneiform bones articulating with the bases of the corresponding five metatarsals. The second metatarsal and middle

Fig. 7 – The middle cuneiform recess with the position of the two crossed K-wires before reduction.

Fig. 8 – After final reduction and fixation with cross K-wires.

cuneiform forms the centre of the Lisfranc's joint complex (Fig. 12, immediate reduction and maintaining in reduced position is needed for good ligamentous healing. There is a strong plantar side ligament binding all the bone in this joint. This prevents the plantar migration in these dislocations. Also there is no inter-metatarsal ligament between the first and the second metatarsal.

The entire set of tarsals should be counted in both views if pain persisted then a CT of the foot must be done. Quite a few reports of isolated dislocations of middle cuneiform are there with dislocation of intermediate cuneiform being dorsal^{1–4} or plantar.^{5–8} All reported cases are usually single cases^{1–7} except one report⁸ and are mostly neglected. In dorsal

Fig. 9 – The post operative lateral radiographs of the foot.

Fig. 10 – The post operative anteroposterior radiographs of the foot.

dislocations there is an acceptable result even if the patient presented late with closed reduction or open reduction followed by internal fixation with K-wires or screws.^{1–4} But in plantar dislocations such reduction is very difficult and after fixation has acceptable results are seen in few case study,^{6,7} but poor results with reduction and fixation in three cases reported in another study.⁸ In another study when this plantar side intermediate cuneiform is excised the result is acceptable.⁵ Mode of injuries are a fall into a manhole,¹ hammering of foot,⁵ loading of a plantar flexed foot,² walking on a high heeled shoes and tripping³ and fall of heavy weights directly on the foot.⁸ In our case, the patient did not load his limb or the foot was not plantar flexed. An un-protected foot lying on the floor violently stamped from sideways is the cause of the dislocation in our case [Fig. 12](#). The strong plantar fascia and the keystone shape of the middle cuneiform being broader superiorly can be the cause for more dorsal dislocations being

Fig. 11 – The scar of the surgery seen on the left foot at 2 year follow up.

Fig. 12 – A diagram showing the Lisfranc's complex and the violence causing the isolated dislocation of the middle cuneiform. 1–12 marks the individual bones and the force applied. 1. Line in red showing the Lisfranc's joint, 2. Talus, 3. Calcaneum, 4. Navicula, 5. Medial cuneiform, 6. The dislocated middle cuneiform, 7. Lateral cuneiform, 8. Cuboid, 9. First metatarsal, 10. Second metatarsal, 11. Line of force applied in the violence in this case, 12. The fossa of middle cuneiform.

reported than plantar. This case report was presented for its rarity. In our case, this injury was recognized at the earliest and the cuneiform was reduced. At two year follow up, the patient had good foot function as he was able to stand, squat and sit crossed legged. The surgical scar is seen on his foot in [Fig. 11](#). This patient was a farmer and returned to his work. This patient was aware of the fact that his case is being published.

4. Conclusion

This is a case of isolated middle cuneiform dislocation with totally new type of violence. The diagnosis of such an injury should be kept in mind in patients while examining the foot injuries in general. Imaging including CT scan of the foot is necessary to confirm the diagnosis and to plan for the surgical treatment. The case is presented to highlight the need to watch out for them and care for them at the earliest.

Conflicts of interest

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.

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