

Fracture Dislocation of Medial Cuneiform- Navicular along with Lisfranc Injury: A Rare Case

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Abstract

Foot injuries can have a bad influence on overall health and mental status of patients. There are various studies in literature with conclusion that more attention and aggressive management needs to be given to foot injuries to improve the outcome of multiply injured patients. We present case of 51 year male with fracture dislocation of medial cuneiform and lisfranc injury with review of literature.

Keywords: Lisfranc injury; Hyper plantarflexion; Orthopedic surgery; Tarsometatarsal joint

Introduction

Lisfranc injuries are most often caused by hyper plantarflexion of the foot, often during a sporting injury or in high-speed motor vehicle collisions. The most common radiographic findings include diastasis of the base of the first and second metatarsals and the “fleck” sign, though neither is necessarily present in every lisfranc fracture-dislocation^[1].

The lisfranc injury is a popular topic in the radiology, orthopedic surgery and emergency medicine literature, primarily due to the subtleties of the radiographic findings and potentially dire consequences of missed diagnoses. The purpose of this article is to help readers understand the anatomy of the tarsometatarsal joint, identify a systematic approach for the evaluation of the joint and demonstrate how a multimodality approach can be used in both straightforward and more complex cases^[2].

Case Report

51 year old male presented to emergency in MMMC and Hospital with pain and swelling of right foot two days after injury sustained during accident. At the time of presentation there was swelling of the right foot along with formation of blisters. On examination there was tenderness present on right foot. X rays showed fracture of the medial cuneiform with its dislocation and lateral translation of foot through mid-tarsal joint^[3].

CT scan was done to see fracture pattern and dislocation. Lisfranc injury (lateral translation of ant. Column) was confirmed on CT scan. Patient was operated in emergency^[4].

Close reduction was attempted first but was unsuccessful. Then open reduction was done by giving incision over the dorsal aspect of naviculo-cuneiform joint. There was interposition of tibialis anterior tendon. It was reduced by distracting naviculocuneiform joint with help of jess fixator. Fracture and dislocation were fixed with two cancellous cannulated screw of 4 mm. One 3 mm k wire was used to fix the lateral translation. Lateral stability was checked with pronation and abduction and was stable^[5].

Post-operative event was uneventful. Patient was given POP slab for 4 weeks and partial weight advised at 6 weeks. Full weight bearing was advised after k wire removal at 12 weeks^[6].

Results and Discussion

There are three cuneiforms which are wedge shaped bones and they take part in formation of transverse and medial longitudinal arch of the foot. The medial cuneiform articulates with navicular proximally and first metatarsal distally. It serves as a site of attachment of various ligaments and tendons like peroneus longus and tibialis anterior. The inter-cuneiform joints are planar-type joints that provides gliding and rotational movements during pronation and supination of the foot. These bones achieve stability by the deep transverse, dorsal and plantar ligaments. However in cases of extreme plantar flexion these ligament are torn and it leads to dorsal dislocation of cuneiforms (Figure 1)^[7].



Figure 1: Patients reported with pain and swelling in right foot.

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The literature has shown very few case reports of dislocation of cuneiform. These injuries are more common in men undergoing automobile trauma. Fracture dislocation of cuneiform along with lisfranc injury is a rare combination and till now no case has been reported to our knowledge and there is no classification of such kind of injuries. The sequence of events that lead to dislocation of medial cuneiform can be explained as follows (Figure 2)^[8].



Figure 2: X-rays showed fracture of the medial cuneiform with its dislocation and lateral translation of foot through mid-tarsal joint and lisfranc injury.

The patient foot got plantar flexed forcefully when it got stuck under the brakes of the vehicle he was driving and on attempting dorsiflexion of the plantar flexed foot there were disruptions of ligaments around medial cuneiform leading to its dorsal dislocation. Additionally the pull of tibialis anterior during attempt of dorsiflexion might have also contributed to medial cuneiform dislocation. This mechanism also explains dorsal dislocations of other metatarsals leading to concomitant lisfranc injury. Closed reduction can be attempted but it is very difficult to reduce because of swelling and therefore treatment of choice still remains the open reduction (Figure 3)^[9].

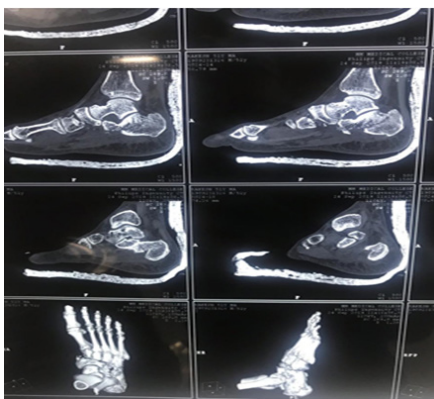


Figure 3: CT scan shows in (lateral translation of ant. column) lisfranc injury.

Lisfranc injury of foot refer to bony or ligamentous disruption of tarsometatarsal or intercuneiform joint. It may be partial or complete depending on severity of trauma. Patients typically present with diffuse pain and swelling in the midfoot and an inability to bear weight. The overlying soft tissue envelope should be inspected, as plantar ecchymosis at the midfoot is highly suggestive of a lisfranc injury. Tenderness to palpation of the midfoot and reproduction of pain with passive motion of the forefoot are suggestive of a lisfranc injury (Figure 4)^[10].



Figure 4: X-ray shows post operatively one screw was inserted from medial cuneiform to 3rd metatarsal to fix Lisfranc injury and fracture of medial cuneiform and one screw was inserted from navicular to 3rd metatarsal and k wire was inserted to fix lateral translation of the foot.

A careful examination of foot and X-ray is required to diagnose lisfranc injury. There are various studies in literature on imaging modality for diagnosing lisfranc injury. On the AP view, the medial border of the middle cuneiform should line up with the medial border of the second metatarsal. Next, on the 30° oblique view, the medial border of the lateral cuneiform should align with the medial edge of the base of the third metatarsal and the medial border of the cuboid should line up with the medial edge of the fourth metatarsal on the same oblique film (Figure 5)^[11].



Figure 5: Shows clinical picture of midfoot injury.

Finally, on the lateral view, no metatarsal should lie more superior or inferior than its respective tarsal bone. Disruption of any of these associations represents an injury to the tarso-metatarsal or intertarsal joint. The “fleck” sign represents an avulsion fracture of the lisfranc ligament from the base of the second metatarsal. This radiographic finding is diagnostic for a lisfranc joint injury (Figure 6)^[12].



Figure 6: X-ray shows fracture dislocation of medial cuneiform-navicular along with lisfranc injury.

The original classification system by Quenu and Kuss described injuries as homolateral, isolated or divergent based on the direction of the displaced metatarsals further categorized Lisfranc injuries into Type A, B or C based on displacement and incongruity with a system that they thought would dictate treatment. Myerson followed with modifications to this system based on direction of dislocation. Despite these multiple classification schemes, outcome and treatment do not reliably correlate with any injury type. And case reported here does not fit in any of the category. Hence it is concluded from this case report that fracture dislocation of medial cuneiform along with Lisfranc injury is a rare combination^[13-15].

Conclusion

There is not mention such kind of injury in Lisfranc classification. In brief thorough clinico-radiological examination should be done to detect foot injury. Normal looking X-ray and abnormal pain in foot indicate the clinician to go for stress X-ray, CT or MRI scan as these injuries need a prolonged rest and physio programme as compare to simple foot sprain. Open reduction is the gold standard treatment for these injuries. Lateral stabilization can be done if skin condition is good.

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