Lisfranc Injuries

Q: What is a Lisfranc injury?

Lisfranc injuries are a spectrum of injuries, from a simple sprain to complete disruption of the tarso-metatarsal joints in the midfoot. These typically occur at the base of the 2nd metatarsal. Lisfranc injuries are easy to miss because they are very uncommon and because the x-ray findings are often subtle or even absent. Low velocity injuries are typically more commonly missed than high velocity ones.

Q: What is the usual mechanism of injury for a Lisfranc?

Plantar flexion with external rotation is typical for a Lisfranc injury. A classic example is a fall from a horse with the foot caught in a foot stirrup. Other examples include: MVC, foot planted in hole, awkward step off of a curb. In children, a classic history for a Lisfranc injury is the “bunk bed fracture” where a child leaps from one bunk bed to another, landing on their toes with an axial load on a plantar flexed foot.

Q: What are the physical exam findings in a Lisfranc Injury?

Patients are typically unable to weight bear. A key clinical clue is a hematoma/echymosis on the plantar aspect of the foot. Commonly, there is significant dorsal midfoot swelling.

Look for signs of compartment syndrome, which may include: parasthesias or hyperesthesia, particularly in the first dorsal webspace.

For more on compartment syndrome see Episode 28 on Vascular Catastrophes with Anil Chopra and David Carr.

Q: What are x-ray findings of a Lisfranc injury?

Commonly, patients have a normal-appearing x-ray. Obtain 3 views of the foot (AP, lateral and standard 45 degree oblique views).

Common x-ray findings include:

1. Misalignment – normally on the AP x-ray, the medial edge of the base of the 2nd metatarsal should line up with the medial edge of the medial cuneiform. On the oblique x-ray, the medial edge of the 3rd and 4th metatarsals should line up with the medial edges of the middle and lateral cuneiforms.
Fig 1A, 1B: (A) normal alignment of 2\textsuperscript{nd} metatarsal on ap x-ray. (B) normal alignment of 3\textsuperscript{rd}/4\textsuperscript{th} metatarsal on oblique x-ray

2. \textit{Widening} – look for widening between the bases of the 1\textsuperscript{st} and 2\textsuperscript{nd} or 2\textsuperscript{nd} and 3\textsuperscript{rd} metatarsal bases. Widening >2mm is an indication for urgent surgical intervention.

3. \textit{Any fracture or avulsion} – look for a ‘\textbf{fleck sign}’ (fig 2), which is pathognomonic for a Lisfranc injury. This is a small bony fragment avulsed from the second metatarsal base or medial cuneiform.

Q: What if the x-rays are normal, but you still clinically suspect a Lisfranc injury?

Obtain a 30 degree oblique x-ray – this eliminates overlap of metatarsals.

Consider \textit{weight-bearing stress views}, following an ankle nerve block.

Consider a \textit{CT of the foot} if the x-rays still do not show an injury and you remain suspicious.

Q: What is the appropriate ED management for a patient with a Lisfranc injury?

For an undisplaced or suspected injury without radiographic findings, place the patient in a posterior back slab. Patients should be non-weight bearing, and outpatient follow up should be arranged with orthopedics. Discharge instruction should include elevation of the leg, and warning signs of compartment syndrome of the foot.

In a significantly displaced injury or dislocation (>2mm widening at the Lisfranc joint) – immediate
orthopedics referral in the ED is required for urgent surgical intervention.

Key References


