



EM CASES SUMMARY

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Episode 52 – Commonly Missed Uncommon Orthopedic Injuries

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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/ecchymosis 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 2nd metatarsal on ap x-ray. (B) normal alignment of 3rd/4th metatarsal on oblique x-ray

2. *Widening* – look for widening between the bases of the 1st and 2nd or 2nd and 3rd metatarsal bases. Widening >2mm is an indication for urgent surgical intervention.
3. *Any fracture or avulsion* – look for a ‘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.



Fig 2. Fleck Sign

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 *weight-bearing stress views*, following an ankle nerve block.

Consider a *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

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