Lisfranc Fracture-Dislocations

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Lisfranc Fracture-Dislocation

- History
- Definition
- Clinical presentation
- Mechanism of Injury
- Classifications
- Imaging
- Treatment
- Conclusion
History

Jacques Lisfranc
Definition

- Where the metatarsals dislocate from their normal articulation with the mid-tarsal bones
- Most commonly involves the 1st and 2nd metatarsals and the medial cuneiform
- Incidence is 1 in 55,000 people each year
- Easily missed on initial x-rays
- Can be difficult to diagnose
Clinical Presentation

- Swelling and large lump in the midfoot
- Unable to weight bear
- Tenderness along the tarso-metatarsal joints
- Tenderness with passive abduction and pronation of the forefoot with the hindfoot held flexed
Clinical Presentation

- Instability of the Lisfranc Joint
- Plantar midfoot ecchymosis
Mechanism Of Injury

- Hyper-extending the forefoot
  - Catching the forefoot in a hole in the ground
  - Horseback rider falling and hanging the forefoot in the stirrup

- Commonly seen as a Charcot’s Joint in diabetic patients

- RTA’s – especially when foot is trapped in dorsi-flexion under the foot pedal

- Crush injuries
Mechanism Of Injury

- Placing the foot into extreme plantar flexion with an axial load
Classification

- Sprains are the most common injury to the tarso-metatarsal ligament, it is graded I, II and III (Burroughs et al 1998)
- **Grade I** - Pain at the joint, minimal swelling and no instability of the joint
- **Grade II** – Increased pain and swelling of the joint, with mild laxity but no instability
- **Grade III** – Complete ligamentous disruption and may represent a fracture-dislocation
Stage I

Lisfranc ligament sprain
No diastasis

Stage II

Ruptured Lisfranc ligament
2-5mm diastasis
Diastasis, no arch height loss

Stage III

Ruptured Lisfranc ligament
2-5mm diastasis
Diastasis & loss of longitudinal arch height
Adam and Dixon 2008, say there are 2 basic types of Lisfranc injuries, homolateral and divergent:

- **Homolateral** – Where the metatarsals are shifted laterally
- **Divergent** – The first metatarsal shifts medially and the remainder of the forefoot shifts laterally
Classification

Tarsometatarsal (Lisfranc) Fracture / Dislocation
Myerson 1986, identifies 3 classifications of Lisfranc Injuries:

- **Total incongruity** – Can be either medially or laterally displaced
**Classification**

- *Partial incongruity* – Either medial (Type B1) or lateral (Type B2), the most common type.
Classification

- *Divergent displacement* – Either partial (type C1) or total (type C2)
Imaging

- First investigation is a plain film x-ray AP and Oblique
Imaging

- Plain film plays a very important role in diagnosing Lisfranc fracture-dislocations
- To look for alignment
- On the AP, the lateral border of the 1st metatarsal is aligned with the Lateral border of the medial cuneiform
Imaging

- On the AP the medial border of the 2\textsuperscript{nd} metatarsal is in line with the medial border of the intermediate cuneiform
Imaging

- On the oblique view

- Medial and lateral borders of the lateral cuneiform should align with the medial and lateral borders of the 3\textsuperscript{rd} metatarsal
Imaging

- Also on the oblique
- Medial border of the cuboid should align with the medial border of the 4\textsuperscript{th} metatarsal
Imaging

Radiology.com 2006
Imaging

- Patients still may need further plain film views
- Weight-bearing AP
- Weight-bearing lateral
- Stress views done under anaesthetics
Imaging

- CT plays an important role in looking at the widening of the joint spaces
- CT also can detect associated fractures
- Help with confirming the diagnosis
- Help to formulate the surgical treatment plan
Imaging

- MRI can be useful to evaluate the soft tissue damage
- Looks at the Lisfranc ligament
- Not routinely used
Imaging

- Doppler ultrasound may be used to look at the dorsalis pedis artery if it can not be felt by hand.

- Nuclear medicine could be used but you could not distinguish any fractures.
Fractures Associated with Lisfranc Dislocations

- Base of 2\textsuperscript{nd} metatarsal
- Cuboid
- Fractures of the shafts of the metatarsals
- Dislocations of the 1\textsuperscript{st} (medial) and 2\textsuperscript{nd} (middle) and cuneonavicular joints
- Navicular
Treatment

- For a Lisfranc sprain:
  - Non-weight bearing
  - In a cast or removable boot
  - 4-6 weeks recovery
  - Physiotherapy
  - Gradual return to activity
Treatment

- For a Lisfranc fracture-dislocation, it is usually surgery
  - ORIF
  - K-Wires
  - Arthrodesis
- Complications with surgery
- Can take up to 1 year to recover
Examples of Lisfranc Injuries 1
Examples of Lisfranc Injuries 1
Examples of Lisfranc Injuries 2
Examples of Lisfranc Injuries 3
Example of Lisfranc Injuries 3
Conclusion

- Serious injury
- Difficult to diagnose
- Can lead to compartment syndrome
- Can have vascular compromise if not treated quickly
- A quick and accurate diagnosis can allow the appropriate treatment to take place efficiently
- Can take a long time to recover
- Complications that may lead to further surgery
- Advance practice plays an important role
References

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Any Questions