Lisfranc Injuries: Bridges, Plates & Screws

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- **Lisfranc Injuries**: Controversy abounds with a paucity of guiding literature!

- Low vs. High Energy Injuries
  - Same Name but Very Different Animals
  - Treatments may Differ Depending on Energy of Injury
  - Think of a Lisfranc “Complex,” Not simply a Lisfranc Joint

- **Anatomy**
  - More Motion in Lateral Columns than Medial or Middle
    - Like the Hand, More Motion on Ulnar Side CMC Joints
  - 26% of Lisfranc ligaments are double bundled (Panchbhavi, FAI 2013)
  - There are Intermetatarsal Ligaments between Metatarsal 2-5, not between 1 & 2
  - Shear forces across the Lisfranc ligament, not compression
    - May Lead to Poor Outcomes

- **Diagnosis** – Up to 20% missed initially especially with lower energy type
  - A stable midfoot sprain does occur but is rare
  - Watch out for Plantar Ecchymosis with “normal” x-rays
  - Weight Bearing X-rays: Both Feet (AP view) on one cassette
  - MRIs helpful for low energy Lisfranc injuries
    - Look for increased signal around Lisfranc ligament on axial views
  - CT scans show small fractures or comminution
  - Stress Views are very helpful
    - Time consuming and painful for patient in the clinic
    - Usually done in the OR when suspicion is high
    - If stress views are negative, patient can be treated non-surgically, but this is rare.
• Surgical Treatment Questions:
  o Timing: as soon as swelling allows and patient is stable
  o Open or Percutaneous: almost always an open approach personally although the percutaneous approach has its advocates
    ▪ Difficulty is not removing tissue or debris out of Lisfranc joint with percutaneous approach and still achieving anatomic reduction
  o Fix or Fuse: We try to avoid fusion in higher level, younger athletes as motion in the TMT joints seems to be important for sports function although this is largely expert opinion (Myerson ICL 2008)
  o Fusion is preferred in higher energy, purely ligamentous cases:
    ▪ Also preferred for a salvage procedure for a failed ORIF
    ▪ Definitive surgery with decreased reoperation rate
  o How to Fix: Intra-articular screws, dorsal plate, endo-button
    ▪ Screws can break at the joint, which are hard to remove, but are still probably “the gold standard.” Solid screws are preferred to cannulated given their increased strength. The number of missed attempts with a 2.5 mm drill is usually not recorded!
    ▪ Dorsal Plating is a newer approach but is clinically untested and unpublished.
    ▪ Endo Buttons are another intriguing idea but offer little sagittal plane support. Hardware removal is usually not needed.
  o Timing: When (if ever) is it Too Late to Fix: Perhaps 8-10 weeks but evaluate on case by case basis, presence of intra-articular comminution would mandate a fusion
    ▪ Limited Fusion? – Debriding the Lisfranc “Joint” for subacute low energy injuries
  o To Remove the Hardware or Not: Almost always recommended at a minimum of 4 months for plate or screws, keep in longer in heavier patients (more than 250 lbs.)
    ▪ Leaving hardware in indefinitely is thought to be likened to a fusion by some

• Complications
  o Residual pain & stiffness midfoot / forefoot
  o Midfoot Arthritis
  o Persistent numbness / tingling (DPN) / CRPS
  o Hardware failure
  o Planovalgus deformity
References: