LISFRANC INJURIES
FIX OR FUSE?

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Introduction

• Uncommon Injuries
• Highly Variable Injuries
  • Trauma
  • Sports
• Associated with other injuries
Osseous Stabilizing Structures

- Middle cuneiform is recessed proximally

Ligamentous Stabilizing Structures

- Intertarsal
- Lisfranc

Inter-cuneiform instability
Significance of Lisfranc Injuries

• Soft tissue injury

• Minimal bony displacement may understate ligamentous injury

Significance of Injury

• Diagnosis is missed or delayed in up to 20% of cases

• Litigation

Impact of Injury

• It’s a Lisfranc until proven otherwise
Normal x-rays

- Lateral: A metatarsal should never be more dorsal than its respective tarsal bone

Imaging of Lisfranc Injuries

- Dynamic Joints
  - Weight bearing radiographs crucial
Imaging of Lisfranc Injuries

• Contralateral views

Closed Reduction

• Urgent if impending skin compromise
• Can be blocked by tendons, ligaments, bone

Indications for Surgery

• Ligamentous Instability
• Multiple fractures
• Displaced fractures
Operative Treatment

Options
- ORIF
- Primary Arthrodesis
- Percutaneous pinning/screws

Rationale for ORIF
- Preserve the joints at all costs
- Do not eliminate a motion segment of the foot
- Hard to make the multiple fractures and a fusion heal
- Traditional treatment

"I always do ORIF, and then I take out my screws"

"I always fuse the joints"

"I always do ORIF, but I leave my screws in"
Hardware

• What to use?
  • Screws
    • 3.5mm or 4.0mm cortical
    • Cannulated screws
  • Spanning Plates
    • "joint sparing"
    • comminution
  • Tightrope

Hardware

• Plates

Hardware Removal?

• Indications!
  • When?
Operative Technique

Incisions

Operative Technique

Dissection/Access

Operative Technique

• Dissection/Access
Operative Technique

• Dissection/Access

Operative Technique

• Reduction/Temporary Fixation

Operative Technique

• Where to start?
  • Medial to lateral
  • Lateral to medial
  • Least to most comminuted

• My Preference
  • Reduce any intercuniform instability
  • Key in the second ray
  • 1st, 3rd then 4th and 5th
Operative Technique

• Internal Fixation

Operative Technique

• Internal Fixation

Operative Technique

• Internal Fixation
Results of ORIF

- Requires anatomic reduction
- Poor outcomes
- Rapid progression of arthrosis
- Need for further procedures

Alternatives to ORIF?

Primary Arthrodesis

- High incidence of PTOA post Lisfranc injury
- Recommended primary fusion
  - Granberry Surg Gyn Obs 1962
- Significant improvement after midfoot arthrodesis for PTOA
- Improved results with early fusion for PTOA midfoot
  - Sangeorzan et al FAI 1990
  - Komenda et al JBJS am 1996
Rationale for Fusion

- Medial column of the midfoot functions rigidly during gait for stability
  - "non-essential joints"
- Lateral column (4th, 5th TMT) is the mobile midfoot segment
- One operation, one recovery period
- Fusion after ORIF is technically more difficult

Primary Arthrodesis (PA) vs ORIF

- Ly & Coetzee JBJS 2006
  - Randomized prospective study, improved results in PA vs ORIF for ligamentous injuries
- Henning et al FAI 2009
  - Less secondary procedures and trends towards better outcomes in PA vs ORIF
- Mulier et al FAI 2002
  - Advocated for partial primary arthrodesis for medial column

Reduce and Pin unstable joints
Remove pins and debride one joint at a time

Screw Fixation

Pin 4th and 5th if unstable, don’t fuse
DO NOT fuse in situ!

Comminution

Fuse with Plates
**Post-Op**

- Remove K wires at 4 weeks
- NWB Short leg cast(fusion) boot (ORIF) X 8 weeks
- Boot, gradual WB over next 2-4 weeks
- PT or HEP

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**What Do I Do?**

- **Fusion**
  - High energy injuries
  - Patients selection
    - (IVDA, WC, obese, elderly)
  - Highly comminuted joints
- **ORIF**
  - Low energy
  - Athletes, young & healthy

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**Do I fuse everyone?**
Summary

- Complex Injuries with poor outcomes
- Each injury, patient unique
- Do not miss subtle injuries
- Goal of fixation → Stable painless plantigrade foot
- Fuse vs. ORIF – still controversial