



Ep 16 Lisfranc Injury - Dr. Hogan Notes-



History/Physical

- high energy injury such as fall from height or MVC or crush injury, but can be from lower energy injury depending on position of foot
- Result from a combination of axial load and dorsiflexion, plantarflexion, abduction, or adduction of the midfoot.
- Swelling and inability to bear weight
- **Plantar ecchymosis at the midfoot**
- Pain at the midfoot
- Pain with passive forefoot range of motion



Imaging

Plain Radiographs

Classically includes the first, second, and third tarsometatarsal joints, may involve all 5 tarsometatarsal articulations, extension into the intercuneiform joints, or even fx lines into cuboid, metatarsal shafts or necks

AP= intra articular displacement through first and second TMT joints (Lisfranc Joint), intercuneiform joint, and naviculocuneiform joint; Fxs through 1st and 2nd metatarsal bases, medial and middle cuneiforms, and proximal extension into navicular

- **Weight bearing films** for more subtle injuries
- **Fleck sign is pathognomonic for lisfranc injury (avulsion of fracture of base of second metatarsal or medial cuneiform)**

Oblique(30 degrees internal rotation)- displacement 3rd, 4th, 5th metatarsal bases, lateral cuneiform, and cuboid

Lateral- dorsal-plantar displacement of fractures or dislocations and flattening of the medial longitudinal arch



Disruption of the continuity

- **lateral border of medial cuneiform is in line with lateral border of base of first metatarsal**
- **disruption of the continuity of line drawn from the medial 2nd metatarsal to the medial side of the middle cuneiform**
- **widening of the interval bt the first and second ray**
- **medial side of the base of the fourth metatarsal does not line up with medial side of cuboid on oblique view**
- **metatarsal base dorsal subluxation on lateral view**
- disruption of the medial column line
 - 4th metatarsal and medial border of cuboid should be collinear





Anatomy

Lisfranc Ligament- *Interosseous* ligament that goes from plantar surface of medial cuneiform to base of 2nd metatarsal on plantar surface

- Tarsometatarsal joints are stabilized by dorsal and plantar tarsometatarsal ligaments
- **Dorsal weaker than Plantar (bony displacement more likely to be dorsal with injury)**
- Intermetatarsal ligaments provide stability through 2nd - 5th metatarsal bases
- **2nd and 3rd TMT joints are most stable** (maximal sagittal motion up to .6mm for 2nd TMT joint and 1.6mm for 3rd TMT joint)
- 2nd TMT joint stability based on bony stability- **its recessed as keystone between medial + lateral cuneiforms**
- 1st TMT joint is mobile
- 4th and 5th metatarsals articulate w/ different cuboid facets

Cuneiform bones are part of transverse arch

Middle cuneiform and 2nd metatarsal base serves as keystone of transverse arch

Transverse metatarsal ligament secure bases of 2nd-5th metatarsals

- Nothing between 1st and 2nd metatarsal.. So ligaments secure medial cuneiform to second metatarsal to maintain mortise relationship

Columns of the midfoot

Medial Column- first tarsometatarsal and navicular--medial cuneiform articulations

Middle column- second and third tarsometatarsal joints and articulations bt navicular and middle and lateral cuneiforms

Lateral Column- fourth and fifth tarsometatarsal (Most mobile) Essential for normal foot functio



Treatment

Nonop Indications (cast immobilization, x-rays Q2 weeks, transition to boot at 6wk)

- No displacement on weight bearing and stress films
- Malalignment <1mm, articular displacement <2mm, intact medial column of foot, no vascular compromise, no associated midfoot injuries

Operative

- evidence of instability (>2mm shift)
- Malalignment <1mm
- Soft tissue/bone fragment preventing reduction
- Medial column instability/shortening
- Associated Multiple midfoot injuries
- Bony vs ligamentous

Arthrodesis vs ORIF vs Closed Reduction w/ PCP

- Controversial

ORIF can be performed with plates and screws

Recommended to take out the hardware in around 12-16 weeks post-op

Purely ligamentous injury = Arthrodesis





Nailed It Ortho podcast episode

- Ig: Naileditortho -
Naileditortho@gmail.com -
www.naileditortho.com

References:

Ly TV, Coetzee JC. Treatment of primarily ligamentous Lisfranc joint injuries: primary arthrodesis compared with open reduction and internal fixation: a prospective, randomized study. *J Bone Joint Surg Am* 2006;88A:514-520