

Problematic Foot & Ankle Fractures



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Disclosures

- Arthrex- Speaker/Consultant

Problematic Fractures

- 5th Metatarsal Jones
- Lisfranc Injury
- Diabetic Ankle

5th Metatarsal Fractures

- I Tuberosity
- II Jones
- III Diaphyseal
- MOI



Zone I: 5th MT Fx's

- Non-Surgical Treatment
 - Boot/shoe
 - 8 weeks
 - Fibrous union
- Surgical Treatment
 - 2mm/30%



Other Normal Findings



Zone II: 5th MT Jones Fractures

- Zone II- watershed
- MOA
 - Acute: adduction
 - Chronic: micro trauma
 - More common Z III
- 4/5 MT Cuboid Jt



Non-Operative Treatment

- Zone II (Jones)
 - 4 wk NWB cast
 - 4 wk prog WBAT boot/cast
- Healing 75% by 5 months
- 1/3 Refracture
- ? Bone Stimulators

Surgical Treatment Zone II

- Acute fracture in Athlete
- Stress fracture delayed/non-union or refracture
- Cavovarus foot



IM Screw Fixation

- 2 wk NWB splint
- Prog WBAT Boot/PT
- Wean Boot 4-6
- Inserts, 6-8 wk impact (rigid sole- sports)

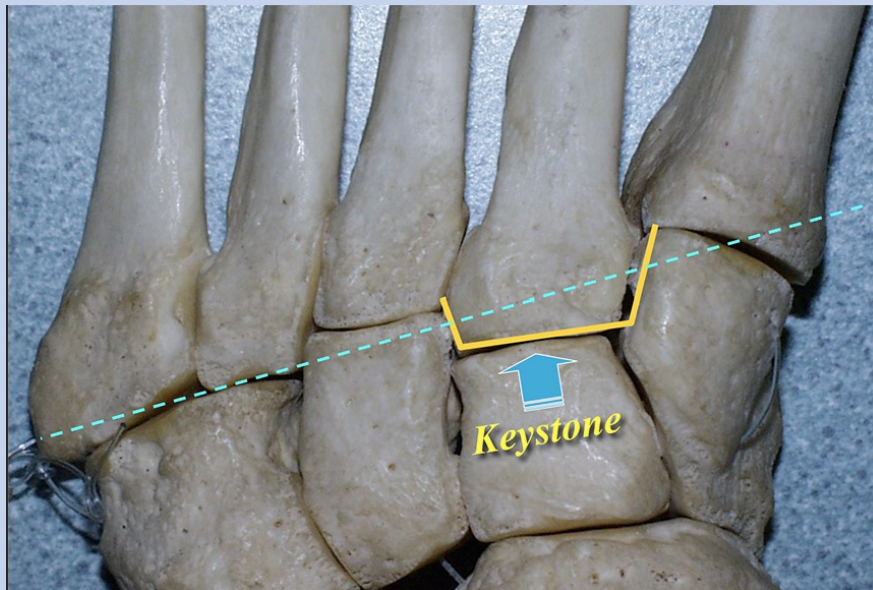


Lisfranc Joint Injuries

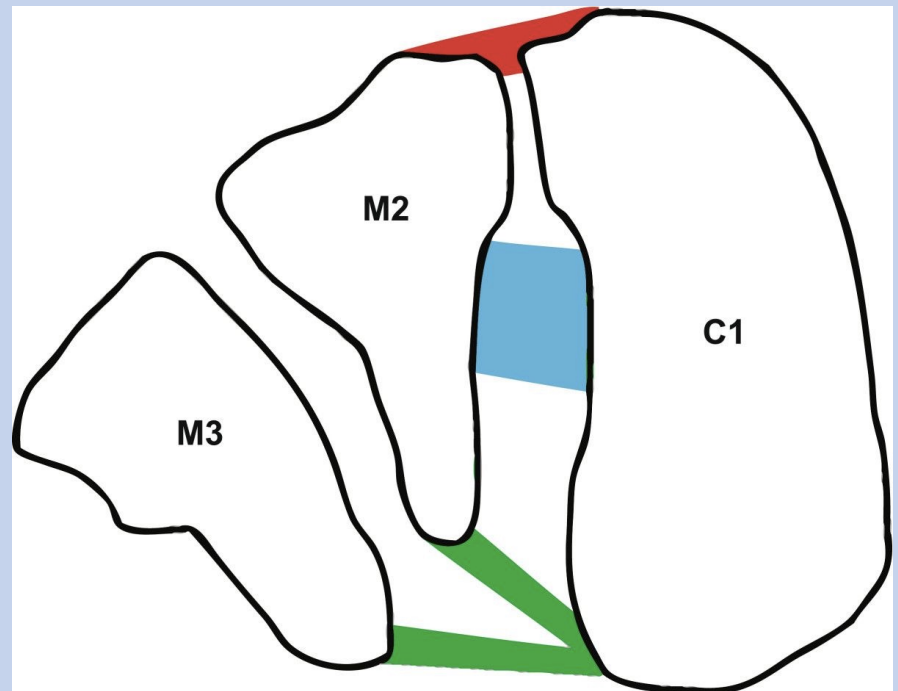
- Average age 30
- Males 2-4x more likely
- Intertarsal/metatarsal articulation and stability
 - 1-3 MT-C dorsal based trapezoid (Roman Arch)
 - Recessed 2nd MT base (apex of Arch- Keystone)
 - Often results in fracture base 2nd MT
- Stronger plantar ligamentous complex

Lisfranc Complex

Recessed 2nd MT



Roman Arch



Lisfranc Injury

- MOI
 - Direct Injury
 - High energy (MVA)
 - Dislocations
 - Indirect
 - Twist/axial load
- Presentation
 - Swelling
 - ecchymosis



Lisfranc Injury

High vs Low Energy

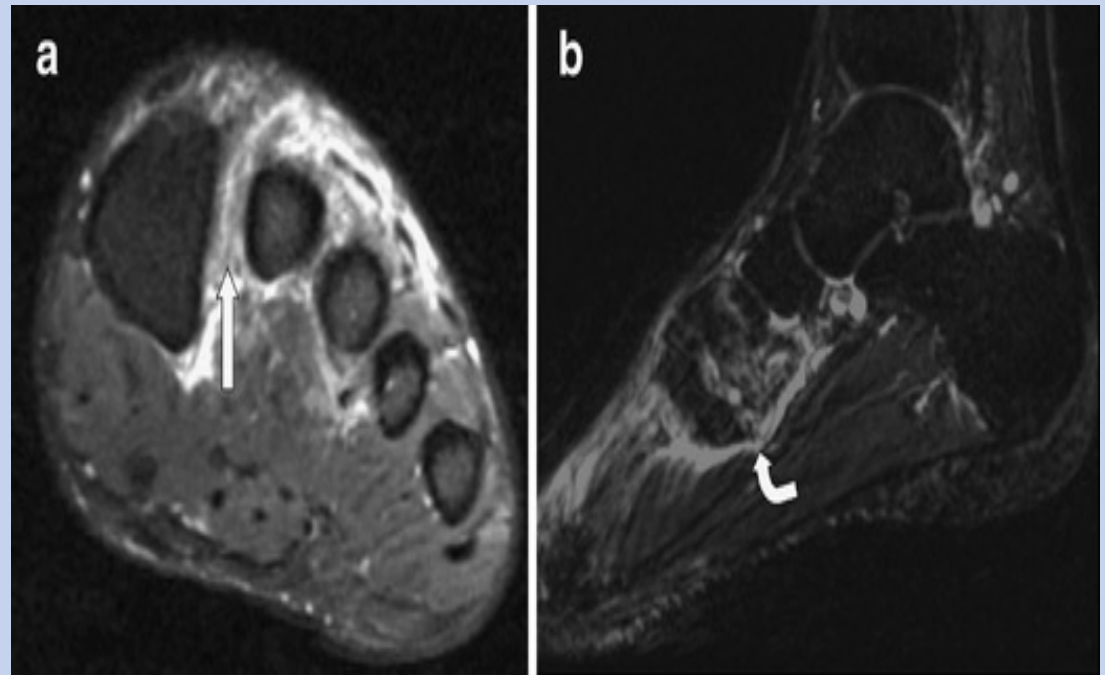


Weight bearing Xrays



Lisfranc Injury

- Imaging
- WB Xrays
 - Repeat if needed
- MRI
 - Inconclusive XR
 - Plantar portion torn = intra op findings 90%



Lisfranc Non-Surgical

- Partial tear
- Stable WB XR
 - Serial exam
- NWB cast/boot 6-8 wk
- Prog WBAT in boot 6 wk, PT



Lisfranc Surgical Tx

ORIF

- Simple injuries
- Athlete
- Post op
 - NWB 6 wks, then prog WBAT boot; PT
 - Min 4 months ROH

Fusion

- Higher energy/ complex
- Chondral damage
- ? Pure ligamentous
- Post op
 - NWB 8 weeks, Prog WBAT boot: PT

Diabetic Ankle Fractures

- DM pts ↑ in-hosp mortality, post op complications, length of stay, and \$\$
- Presentation, ED tx similar (some no pain)
- NV status, protective sensation
 - Semmes-Weinstein 5.07 MF
 - Up to 40% DM pts will Dx with neuropathy 1st decade

Neuropathy

- Metabolic/Endocrine
 - DM, Liver Dz, Hypothyroid
- PVD
- Autoimmune
- Renal Dz (dialysis)
- Medications/Chemo
- EtOH
- Lumbar Dz
- Idiopathic

Surgical Treatment ?

- Same indications, unstable/displaced
- Medical Optimization
- Higher risks Complicated DM
 - Neuropathy, Retinopathy, Nephropathy, Hx Charcot

Complications

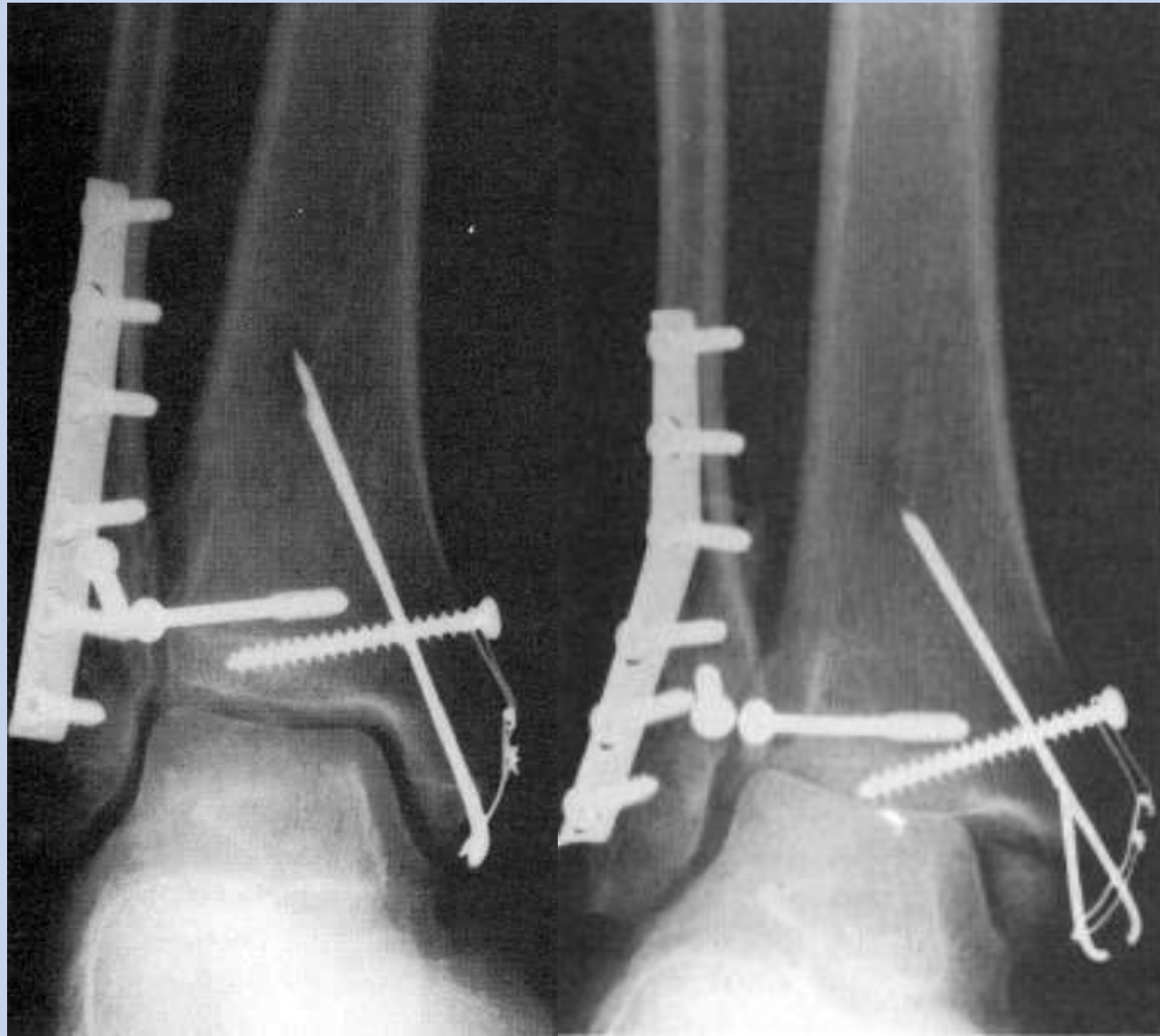
- Non-Surgical Tx
 - 66% infection rate with casting
 - Malunion rates up to 70%
- Surgical Tx
 - 14-64%
 - Amputation rates 2-42 %

Operative Tx Ankle Fx & DM

- Wukich et al, 2011
 - All DM ankle fx with ORIF, complicated DM vs non
 - Infection (sup/deep), mal/non-union, Charcot, amp, rev/fusion
 - Comp DM:
 - 3.8 times risk all complications
 - 3.4 times risk mal/non union, charcot
 - 5 times likelihood revision/arthrodesis
 - Rec: Tx DM neuropathy pt as Stage 0 Charcot
 - Additional fixation, prolonged NWB (min 3 mo)
 - Tetracortical screws, TTC pins

Unstable Fractures

- Require surgical stabilization
 - Use additional fixation
 - E.g.. Multiple syndesmotic screws (Schon & Marks, *OCNA*, 1995)
 - TTC pins (engage tib cortex)
 - Prolonged NWB & immobilization
 - 2-3 x longer than non- diabetic



More IS better



Thank you