



California Orthopedic Association

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UCSD

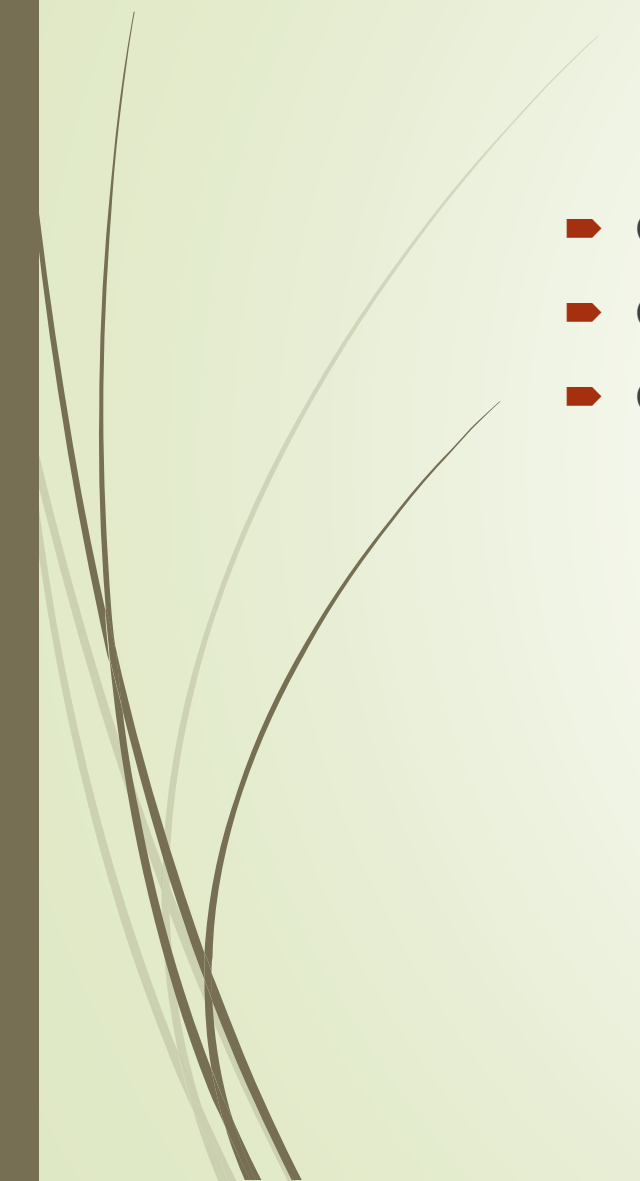
Chief, Foot and Ankle

Associate Professor

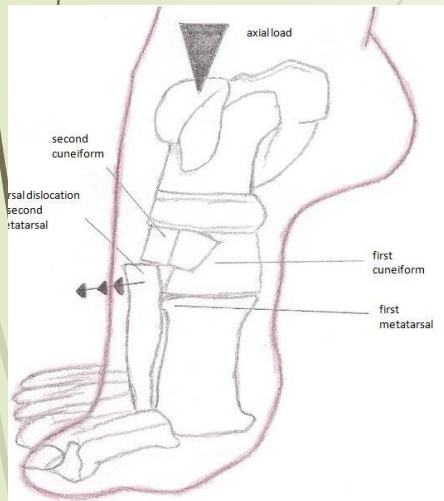
Regional Medical Provider US Olympic Team



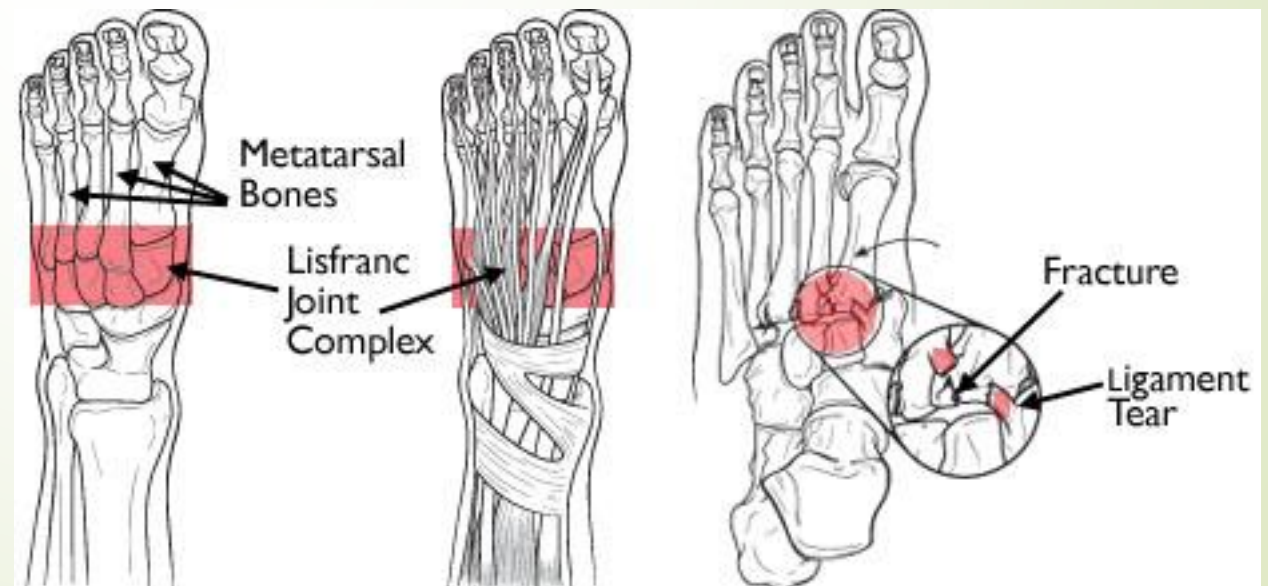
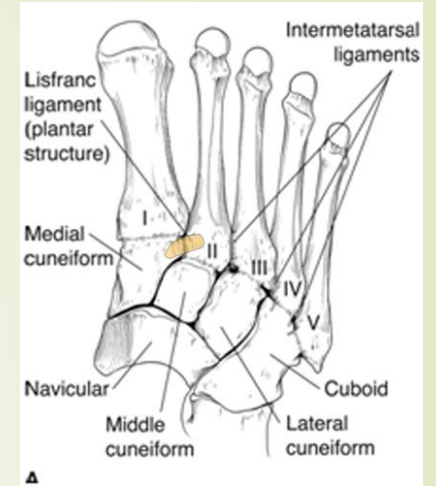
Disclosures

- ▶ Consultant to Tornier
 - ▶ Consultant to Wright Medical
 - ▶ Consultant to Segway
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The Lisfranc Articulation/Ligament



- Bones and ligaments connecting midfoot to forefoot
- Fractures, dislocations, strains, tears
- Single joint or multiple joints
- Ligament from medial cuneiform to 2nd metatarsal base
- 3 bundles
- Cartilage injury



What's the big deal?

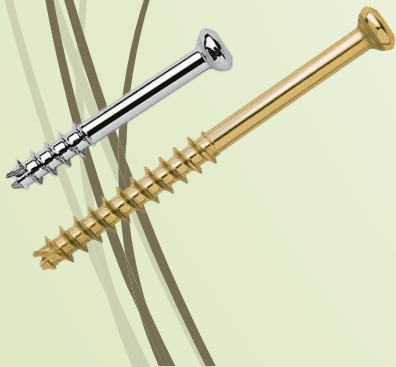
- Often missed-as high as 30%
- Relatively uncommon(1/60K)
- MVC, sports, falls from height
- Fractures/dislocations/subtle injuries=surgery
- Arthritis

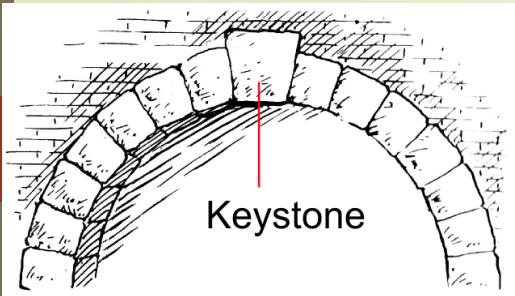




The Lisfranc Injury-Oh the Controversies...

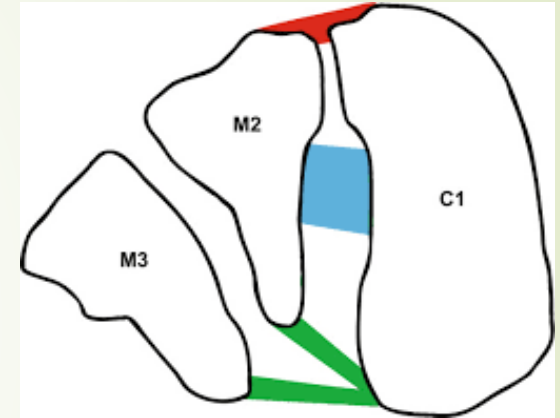
- Which one?
 - Subtle
 - Traumatic
- Fix?
- Fuse?
- Suture button?
- Plates?
- Screws-cannulated/solid?
- Bridge Plates?
- Remove?
- Keep?
- Are people different?





The intricacies that make it difficult...

- No 1st/2nd intermetatarsal ligament
- 3 bundles of different importance
- “Non”-essential joints
- The Keystone
- Subtle instability/multiplanar





What we know...



- Meta-Analysis-PRISMA guidelines-3 trials met criteria
- Risk Ratio for HWR: > for ORIF than fusion
- Risk Ratio for revision surgery: Neither ORIF or primary fusion
- Risk Ratio for patient reported outcomes: Neither
- Risk of non-anatomic alignment: Neither



- Concluded: increased risk of HWR with its morbidity when doing ORIF

- Smith, N et al. Does ORIF vs Primary arthrodesis improve patient outcomes for lisfranc trauma.? A Systematic review and meta-analysis. CORR June 2016, Vol 474, Issue 6 pp1445-1452

Not all athletes are the same...



- ▶ Intolerant of intra-articular screw fixation
- ▶ High risk for post traumatic arthritis
- ▶ "Career Ending"
- ▶ Thought of restoration of motion with suture button
- ▶ 7 dancers/high level athletes
- ▶ Late presentation
- ▶ Allowed return to sport at 6 mos(all did)
- ▶ 15 mo f/u
- ▶ AOFAS scores 65-→97



- ▶ Charlton, T. Boe, C. Throdarson, D. Suture Button Fixation Treatment of Chronic Lisfranc Injury in Professional Daners and High Level Athletes. Journal of Dance Medicine and Science. Vol 19, Number 4 Dec 2015 p135-139

Not all athletes are the same...



- ▶ NFL players 2000-2010
- ▶ Time to return to competition, total games played after injury, total yards, touchdowns, total tackles, sacks and interceptions
- ▶ 28 athletes
- ▶ 11 off
- ▶ 17 def
- ▶ 2/28 never returned(7.1%)
- ▶ 26 returned(92.9%) median 11.1 months; missed avg 8.5 games
- ▶ No statistically significant difference in career length compared with controls
- ▶ Mchale, KJ et al. Outcomes of lisfranc injuries in the NFL. AJSM. Vol 44. Issue 7, 2016



So how?...Plate, screw or combo?



- ▶ Transarticular screws, dorsal plating or combo
- ▶ 50 patients over 6 years-retrospectively reviewed
- ▶ Trans articular screw alone, dorsal bridge plate alone, combo
- ▶ AOFAS midfoot score and FFI
- ▶ Open exposure=more soft tissue comps
- ▶ No significant diff in HW failure or HWR
- ▶ BEST predictor of functional outcome=quality anatomical reduction



- ▶ Lau, s et al. Functional outcomes post lisfranc injury-Transarticular screws, dorsal bridge plating or combination treatment. JOT. 2017



How we got to fusion...

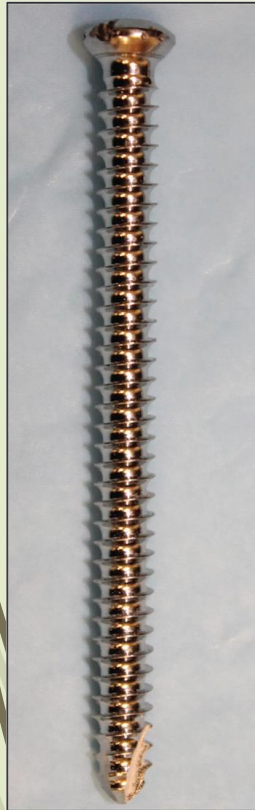


- ▶ 41 patients enrolled Pro RCT
- ▶ ORIF vs Fusion
- ▶ Primary ligamentous Lisfranc
- ▶ f/u 42.5 mo
- ▶ 20 ORIF; 21 primary arthrodesis
- ▶ ORIF AOFAS midfoot score=68.6(at 2yr)
- ▶ Arthrodesis AOFAS score=88(at 2 yr)
- ▶ 5 in ORIF went on to fusion
- ▶ ORIF: activities pre-injury=65%
- ▶ Fusion: activities pre-injury=92%



- ▶ Thuan V. Ly and Chris Coetzee. Treatment of primarily ligamentous Lisfranc joint injuries: primary arthrodesis compared with ORIF. A prospective randomized study.. JBJS Am. 2006 Mar;88(3);514-520

Suture button?



- ▶ 14 fresh frozen cadaveric feet
 - ▶ Registration marker and digitizer dorsal approach
 - ▶ Before and after cutting Lisfranc ligament
 - ▶ Suture button or cannulated screw
 - ▶ Displacement and 3D position of the bones determined
 - ▶ Loading with cut ligament = 1.2 mm displacement with screw
 - ▶ Suture button = 1.0 mm
 - ▶ No significant difference between specimens fixed with screw or suture button
- ▶ Panchbhavi VK et al. Screw fixation compared with suture-button fixation of isolated Lisfranc ligament injuries. *JBJS Am.* 2009 May;91(5):1143-8

My thoughts...



- The subtle injury???
- Cannulated system/Solid screws
- No transarticular screws
- EUA
- Bridge plate when needed
- Fuse high energy (medial/mid column)
- Pin lateral column
- ORIF lower energy (w education)
- ORIF young
- Offer HWR if no fusion
- Backfill with suture button?



NOT



Thank you!

➤ Questions?

