







Stability is key

- This is why arthrodesis remains a good option
 - Not always so straightforward
- Restoration of anatomy is critical regardless
 - Potentially more challenging when excising joint
- A **good outcome requires anatomic reduction** of Lisfranc's articulation
 - anatomic reduction — 50-95% good results
 - non-anatomic reduction — 17-30% good results

What are we restoring

• Radiographs – AP

- 1st MT aligns with MeC both medially/laterally
- 1st IMT space aligns with 1st ITT space
 - Normal 1.3 mm
 - Abnormal > 2 mm
- Medial 2nd MT aligns with medial MiC



What are we restoring

• Radiographs – Oblique

- 3rd IMT space continuous with space between LC and cuboid
- Medial border fourth MT aligns with medial edge of cuboid



What are we restoring

- Radiographs – Lateral
- TMT joints should be uninterrupted, especially the 2nd MT base
- Any dorsal displacement is abnormal



Goals of Treatment

- Painless, plantigrade foot
- Anatomic reduction at TMT joints
- Avoid:
 - Inadequate fixation of medial column
 - Iatrogenic flatfoot deformity

• **LEVERAGE!!**



Controversy

- ORIF vs Primary Fusion
- Pins vs Screws vs Plates
- Gastroc Slide?
- Screw Removal



Evidence

- JBJS Am 2006 Ly and Cotzee
 - Prospective, Randomized Trial of **primarily ligamentous TMT disruption**
 - 20 pts ORIF (18 anatomic)
 - 21 pts primary arthrodesis medial 2 or 3 rays
 - 42 month followup
 - Mean AOFAS scores:
 - 68 in ORIF
 - 88 in arthrodesis

Evidence

- FAI 2009 Henning, Jones et al
 - Prospective randomized of ORIF vs Primary Arthrodesis
 - 14 ORIF
 - 18 arthrodesis
 - 24 month followup
 - SF 36 and SMFA
 - Routine removal of screws
 - No difference in function based on SF 36 and SMFA at any time interval
 - No differences in satisfaction by phone survey at 53 months

Midfoot Scale (100 Points Total)	
Pain (40 points)	
None	40
Mild, occasional	30
Intermittent, daily	20
Severe, almost always present	0
Function (40 points)	
Activity limitations, support	
No limitations, no support	10
No limitation of daily activities, limitation of recreational activities, no support	7
Limited daily and recreational activities, cane	4
Severe limitation of daily and recreational activities, walker, crutches, wheelchair	0
Maximum walking distance, shoes	
Greater than 6	5
4-6	4
1-3	2
Less than 1	0
Footwear requirements	
Flamboyant, recreational shoes, no insert required	5
Comfort footwear, shoe insert	3
Modified shoes or brace	0
Walking surface	
No difficulty on any surface	10
Some difficulty on uneven terrain, stairs, holes, ladders	5
Severe difficulty on uneven terrain, ladders, ladders	0
Gait abnormality	
None, slight	10
Obvious	5
Marked	0
Alignment (10 points)	
Good, plantigrade foot, midfoot well aligned	10
Flat, plantigrade foot, some degree of midfoot malalignment observed, no symptoms	8
Flat, nonplantigrade foot, severe malalignment, symptoms	0
Total	100

American Orthopaedic Foot and Ankle Society
 From: <http://www.aofas.org/4429297/foam.htm?sgid=3494>

AOFAS

- The questionnaire consists of nine items that are distributed over three categories: Pain (40 points), function (50 points) and alignment (10 points). These are all scored together for a total of 100 points
- the AOFAS questionnaire has yet to be validated, and no direct correlations have ever been firmly established between itself and other outcome tools
- there is no consensus on what magnitude of change on the AOFAS score represents a significant clinical change and improvement in the patient's function

Meta-analysis

- CORR June 2016 Does ORIF or Arthrodesis Improve Outcomes?
 - Assessed studies of both purely ligamentous and bony injuries for
 1. Revision surgery --- statistically similar
 2. Implant removal --- more frequent with ORIF (*protocol driven*)
 3. Quality of reduction --- statistically similar
 4. Pt. reported outcome --- statistically similar

Why does ORIF get a bad rap?

- No standardized fixation
 - Sutures (tightrope)
 - Cannulated screws
 - Minifragment plates
 - Small fragment screws
 - Various configurations
- Inaccurate reduction



How to optimize ORIF results

- REDUCTION Matters
 - Restoring alignment on AP/Oblique, but don't ignore the lateral
 - *Medial column should not be parallel to lateral column*
- IMPLANTS Matter
 - Forces are great across TMT joint, particularly plantar gapping
 - Combat leverage with leverage
 - Strength
 - Solid core large diameter screws (4.0 cortex)
 - Newer, low-profile, strong dorsal plating systems
 - Avoid plates or screws in lateral rays





Summary

- Challenging injury with wide spectrum of severity
- Outcome studies are difficult to interpret
- Successful restoration of anatomy with strong, low profile implants that adequately resist deforming forces have a high likelihood of good result
- Leave lateral column mobile with temporary fixation
- Don't remove asymptomatic implants as a protocol
- Treat persistent instability with fusion
