Session Three: Midfoot  
Moderator: J. Chris Coetzee, MD

9:00 – 9:15 am  
Malunion, Midfoot Collapse, and Bone Loss: The Three Phrases You Don’t Want To Hear From Your Spouse  
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B. Midfoot

a. Gateway to hindfoot and ankle (or forefoot) depending on how you’re looking at it

b. Mechanically, physiologically, and anatomically tied to adjacent regions of foot

c. My opinion – toughest part of the foot to treat and heal!!

d. Pathology often leads to compensatory changes in other parts of foot

e. Common complications inherent to all surgeries in all areas

i. Infection

ii. Wound problems

iii. Nerve injury

iv. Chronic pain

f. Failure

i. Modes

1. Recurrent injury

2. Poor tissue quality

3. Inadequate primary procedure

C. Lisfranc injuries

a. Problem(s)

i. Failed fixation

1. Leads to recurrent diastasis and/or post-traumatic arthritis

ii. Arthritis despite fixation
1. See next section

b. Solutions

i. Conventional wisdom

1. Current trend is to adhere to strict principles of fixation and criteria for repair
   a. Anything >2mm
   b. Screw, compression plate, bridge plate

2. Increasing trend toward primary fusion over ORIF
   a. Based on literature from Kuo, Coetzee

3. Variations from traditional forms of fixation
   a. Screws have been replaced by bridge plating to avoid articular damage
   b. Endobutton fixation gaining favor
      i. Tightrope?
         1. Fails to capture sagittal instability if present
   ii. My preference
      1. Low threshold to fix primarily
         a. Risk of late sequellae is high with regard to natural history of untreated lisfranc(Sangeorzan)
         b. Plan on restoring normal anatomy if possible.

2. Rigidly fix
   a. Traditional transarticular screws work well(Hansen)
   b. More recent techniques focus on joint preservation with bridge plating
      i. This also more evenly and better dissipates forces across the recently repaired joint
   c.
3. Fuse if in doubt
   a. Little loss of motion from “nonessential” joints

4. Plan for arthrodesis if pain persists and/or deformity recurs despite prior treatments
   a. In situ with plate fixation if no deformity
   b. Deformity necessitates reduction
      i. Better if done before chronic changes and compensation sets in
      ii. Medial border plate gives some alignment clues but seems to regularly under correct leaving abduction
      iii. N-C , T-N may have compensatory subluxation due to load failure
      iv. May need to include parts of forefoot and hindfoot

D. Midfoot arthritis
   a. Problem(s)
      i. Deformity after failed treatment
         1. Most often reversal of normal arch.
            a. Flattening or even reversal i.e. “rocker bottom”
         2. Possibly midfoot abduction
      ii. Pain
      iii. Failure to achieve good correction
      iv. Failure to recognize mechanical issues completely
         1. Forefoot rotation
   b. Solutions
      i. Conventional wisdom
         1. Midfoot fusion; typically medial and middle columns only
ii. My preference/considerations

1. Typically this is one of the most under or improperly addressed procedures about the foot leaving the fusion inadequately corrected
   a. Compensatory changes are common in fore- and hindfoot
      i. Abduction often extends to transverse tarsal joint as well
      ii. Avoid undercorrection
   b. Don’t forget forefoot rotation – pronation vs supination
      i. Must be corrected for better outcome
         1. Avoid walking only on side of foot
   c.

2. Use generous incision(s)
   a. Depends on prior surgical approaches
   b. Dorsal over 3rd metatarsal and starting at navicular and traveling to MT epicondyles

3. Take down each joint
   a. Be sure to include lateral TMT’s in the takedown, but not the fixation
   b. May even need to release peroneal tendons which can act as deforming force

4. If previously healed, plan for osteotomies
   a. Carefully plan the plane of osteotomy through the midfoot depending on need
      i. That is, if pure rotatory deformity exists, a straight vertical osteotomy may be more beneficial than on oblique one which may shorten or lengthen, plantarflex or dorsiflex, etc.
      ii. May need multiplanar osteotomy with bone wedge removal from apex of deformity
1. Best done through intertarsal joints if close to deformity center

2. Requires large exposure and subperiosteal dissection to avoid tendon and nerve injuries

b. 1st ray, midfoot and heel osteotomies may and will be necessary

c. Plantarflex or depress 1st ray before fusing as it is invariably shorter than the rest

d. Fixation is surgeon dependent but I prefer small yet relatively long locking plates for more rigidity and spanning the unstable area

e. For neuropathies, or those with unstable hindfoot or forefoot, I prefer long axial stability with solid screw or bolt construct

f. External fixation after generous resection of bone for correction is a technically challenging alternative, but very useful

i. Helpful in multiplanar corrections

1. Even if it is to reorient soft tissues and stretch through the joints to achieve more neutral positioning for staged fusion with internal fixation

ii. Useful for open wounds or infections

E. Malunion of prior procedures

a. See concepts on midfoot arthritis

Bibliography

Lisfranc


Coetzee JC, Ly TV: Treatment of the primarily ligamentous Lisfranc joint injuries with primary arthrodesis compared with open reduction and internal fixation – surgical techniqueJBJS 89(A)122-7, 2007.


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Mulier, et al. FAI 2002

**Midfoot arthritis/collapse**


**NOTES**