

MEDIAL COLUMN FOOT FRACTURES APPROACHES & TREATMENT

James R Ficke, MD FACS
Professor and Chairman
Department of Orthopaedics
Johns Hopkins Hospital
Baltimore Maryland

THE JOHNS HOPKINS HOSPITAL

Conflict of Interest Disclosure

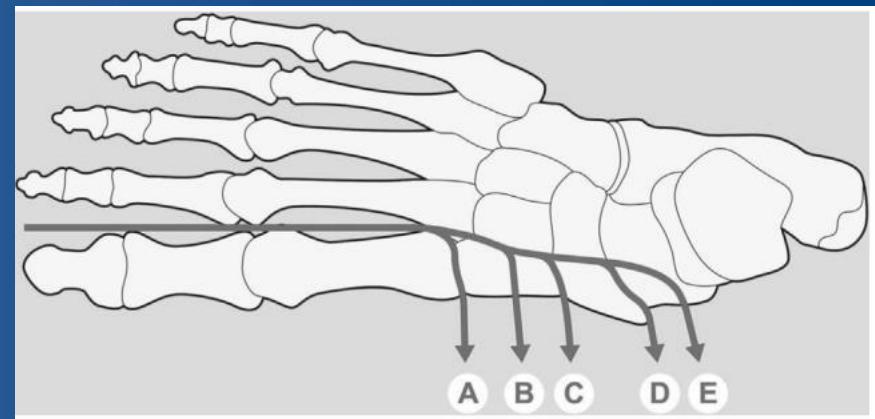
James R. Ficke

- I have no financial conflicts with this presentation
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 - *Research Funding: U.S. Dept of Defense*
 - *DT MedTech- Prospective Trial H3 Total Ankle*
 - *Board of Trustees, Orthopaedic Research & Education Foundation*



Medial Column Injuries

- Dissipation of energy
 - *Through Joints*
 - *Fractures*
- Key to restore length
- Stability of medial arch



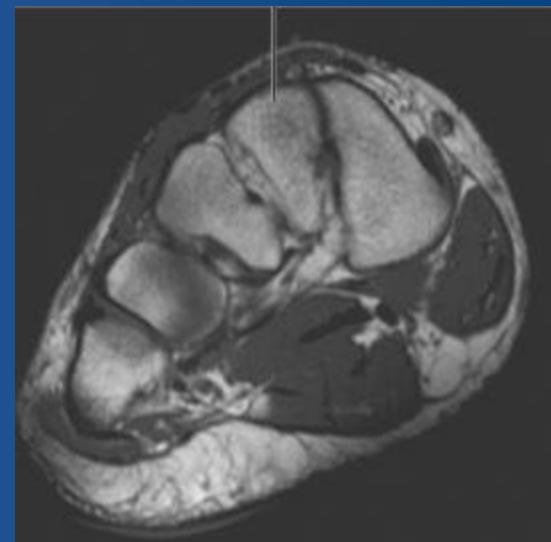
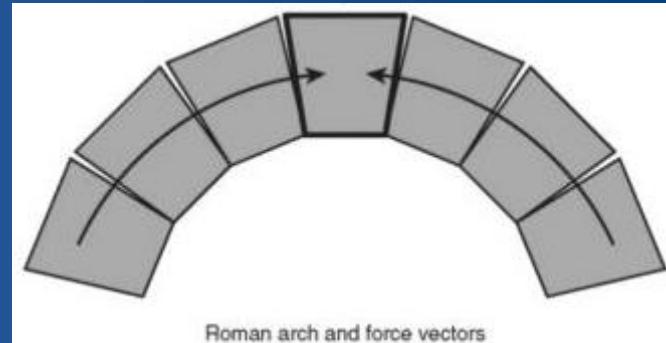
Longitudinal Columns

- Heel Strike- flexible
 - *Absorb energy*
 - *Accept weight*
- Push off- Rigid
 - *Power lever*
 - *Impart energy*



Midfoot Anatomy

- Medial column
- Intermediate column
- Lateral column

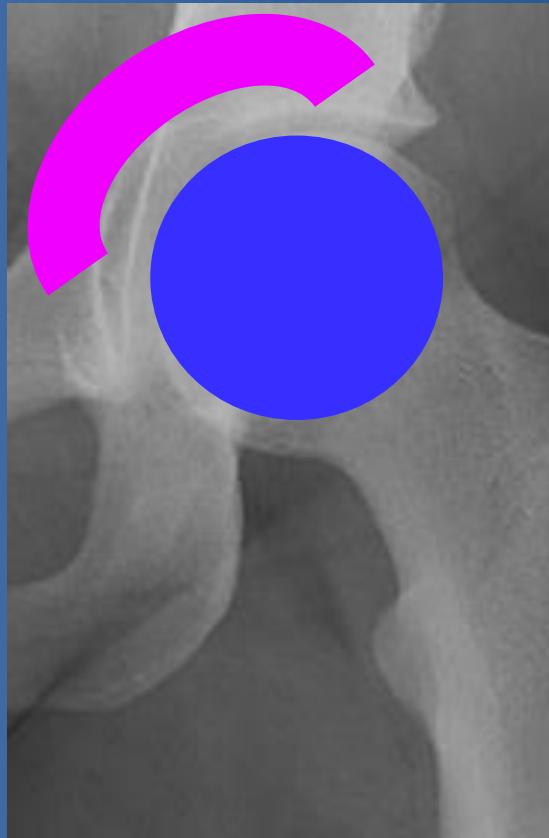




Acetabulum Pedis



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Antonio Scarpa Italian Anatomist
1752-1832



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Talus Fracture- Anatomy

- No tendon insertions
- Ligament/ capsule attachments to neck, medial body, posterior process
- 60-70% covered with articular cartilage
- Tenuous blood supply



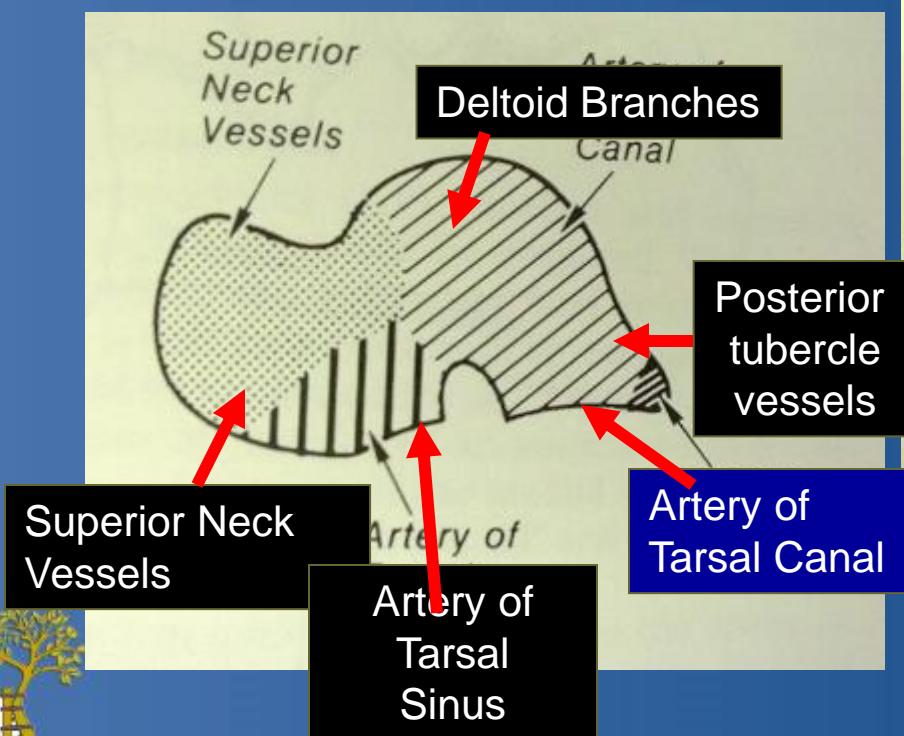


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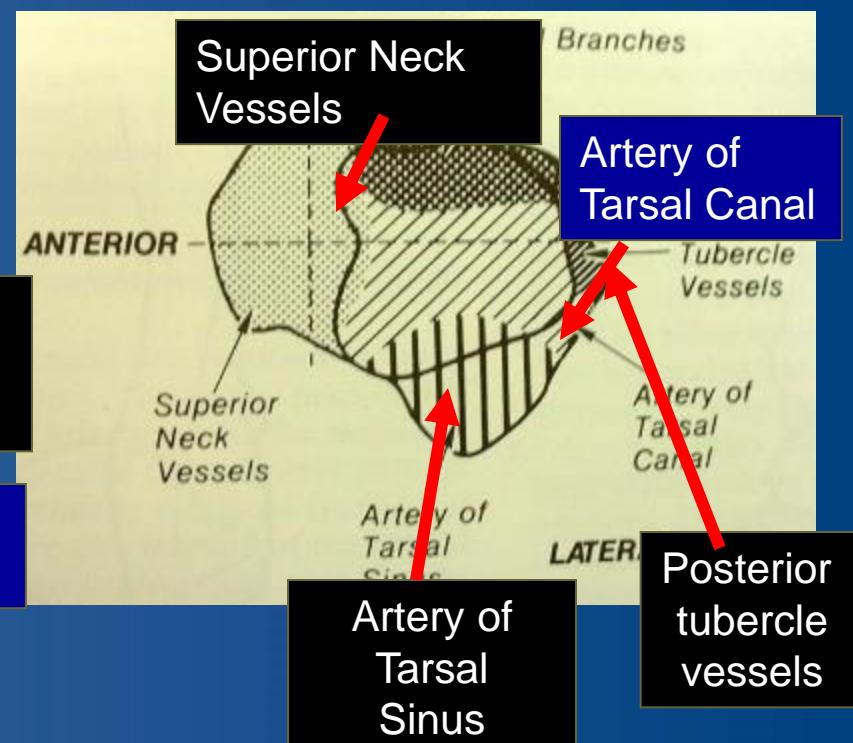
Vascularity

- Artery of tarsal canal supplies majority of talar body

Top View



Side View



Hawkins Classification

Hawkins, LR, JBJS, 52A: 991, 1970

I. Nondisplaced <10%

II. Subtalar Displaced <40%

I. Subtalar & Ankle ~90%

II. *Pantalar 100%





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Treatment Principles: Reduction and Fixation

- **Ensure Anatomical Reduction!!!**
- Anteromedial and Anterolateral Approach
 - *For optimum visualization and fixation*
- Two screws – lag
- Medial malleolus osteotomy if needed





1st Approach: Anteromedial

- Medial to Tibialis Anterior
- More posterior incision for talar body fractures to facilitate medial malleolar osteotomy



2nd Approach: Lateral

- Tip of fibula directly anterior
- Sural nerve at risk
- Mobilize EDB as sleeve
- Protect sinus tarsi contents





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2 incisions: Skin bridge

- Skin bridge well tolerated
- “2 to 1” consideration
- Generally less soft tissue complication





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Head Fractures

- Rare injury
- Seen in high energy axial load situations
- Commonly associated with navicular fx
- articular congruity may be affected





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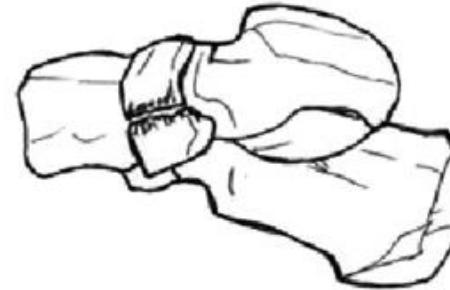
Head Fractures

- Nondisplaced
 - *Well molded SLC*
- Displaced—ORIF
 - *Excise small fragments*
- Complications
 - *DJD*
 - midtarsal vs triple arthrodesis



Navicular Fractures

Sangeorzan Classification



Type I



Type II



Type III



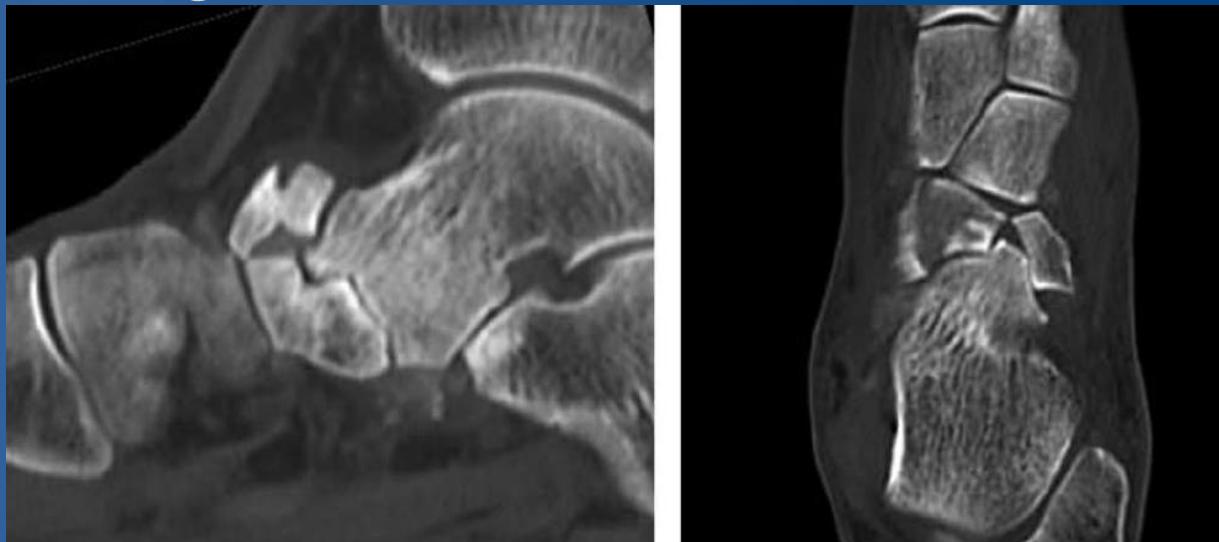
Navicular Body Fractures—Surgical Treatment and Radiographic Results

Roy Sanders, MD*† and Rafael Serrano, MD†

J Orthop Trauma 2020;34:S38–S44)



- 126 Navicular body fractures 10 year period
 - 12/18 Schmidt II healed (67%)
 - 3/21 Schmidt III healed
 - *Uniformly Poor Prognosis*



Beware Column Disruption



Navicular Fx/ Medial Column Disruption



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- 56yo Male
- TN fx- dislocation & cuboid fracture
- PMH of diabetes and smoker



Transarticular Spanning Fixation



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Dorsal spanning plate across middle column



SEVERE Lisfranc injuries

Early Recognition



- Instability
- Open injury
- Vascular Injury
- Skin Compromise





Lisfranc Injury

Radiographs

- Often negative
- WB x-rays if possible
- Check alignment
 - *Medial 2nd MT – middle cuneiform*
 - *Medial 4th MT – cuboid*
 - *Dorsal MT base – Dorsal tarsal bone (lateral)*



Lisfranc - Treatment

- Treatment
 - *Nondisplaced*
 - NWB cast for 6 weeks
 - WB cast additional 4 -6 weeks
 - *Displaced fractures (>2mm)*
 - ORIF





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Restoring anatomy medial / intermediate column

- First metatarsal varus and plantarflexion
- Probe intercuneiform joint for instability
- Medial column carries 40-50% body weight during stance
- Use radiographic markers
- Constructs: plates vs screws



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Outcome Studies

Ly et al JBJS2006

- Compared primary arthrodesis with ORIF in pure ligamentous injuries. 20-ORIF/ 21-arthrodesis
- F/U 42.5 mos.
- Arthrodesis group reached 92% pre-injury activity level
- ORIF group 65% pre-injury level.

Rammelt et al JBJS 2008

- Comparative Study 22 primary ORIF with 22 delayed arthrodesis F/U mean 22 months
- AOFAS scores in the group fixed primarily vs delayed fusion (AOFAS mean 81 versus 72; $p = 0.031$)



Does Open Reduction and Internal Fixation versus Primary Arthrodesis Improve Patient Outcomes for Lisfranc Trauma? A Systematic Review and Meta-analysis

Nicholas Smith MD, MSc, Craig Stone MD, MSc, FRCSC,

Andrew Furey MD, MSc, FRCSC

Clin Orthop Relat Res (2016) 474:1445–1452

- No new studies since 2012!
 - *Outcomes Appear similar*
 - *High performance Athletes/ younger patients RTP*
 - Fixation preferred





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Key Points

- Recognize injury patterns
- Assess entire medial column stability
- CT scan essential- timing
- Achieve alignment and length
- Spanning fixation preferred
- Consider arthrodesis (not always!)



Questions?

