

## Displaced Intra-articular Calcaneus Fractures

- I. Introduction and Objectives
  - a. Detail pathomechanics generating predictable calcaneal fracture patterns
  - b. List adverse sequelae with nonoperative treatment of displaced calcaneal fractures
  - c. Identify surgical exposures and hazards with operative treatment
  - d. Detail an operative sequence and post-operative rehabilitation protocol
  
- II. Calcaneal anatomy
  - a. Osteology and Radiology
    - i. Critical angle of Gissane
    - ii. Calcaneal articulations
    - iii. Harris Beath View
  
- III. Pathomechanics of calcaneal fractures
  - a. Injury mechanism
  - b. Failure of tension and compression trabeculae
  - c. Primary fracture line
  - d. Secondary fracture line
    - i. Joint Depression
    - ii. Tongue Type
  
- IV. Classification
  - a. Letournel
  - b. Sanders
  - c. Essex-Lopresti
  
- V. Adverse sequelae from nonoperative treatment
  - a. Subfibular impingement of peroneal tendons
  - b. Tuberosity malposition laterally with medial overload at heel strike
    - i. Lateral peritalar subluxation
      1. Reduces push off efficiency
      2. Posterior tibial tendon overload
  - c. Peroneal tendon avulsion
  - d. Talar horizontal posture
    - i. Calcaneus must be of normal height
      1. Avoid anterior ankle talar impingement
      2. Maintain leg length
  
- VI. Review of operative outcome data
  - I. Canadian orthopaedic trial, Buckley et.al
  - II. Sanders 20 year follow up data

III. Late reconstructions after initial nonoperative treatment represent possible compromise of outcome

VII. Operative treatment

a. Risks unique to operative management

i. Lateral calcaneal artery

b. Approach

i. Medial

ii. Lateral extensile

iii. Sinus Tarsi

c. Surgical hazards

d. Intraoperative patient positioning

e. A possible operative sequence

i. Anterior process / Angle of Gissane to Sustentaculum

ii. Tuberosity Reduction

iii. Posterior facet reconstruction

iv. Lateral wall reduction

v. Compression with implant

vi. Layered closure

VIII. Post-operative rehabilitation

IX. Cases and approach selection