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 impingment 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