

# **Ankle Fractures in the Elderly: How to Deal with Poor Bone Quality**

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*No disclosures relative to this presentation*

# acknowledgement

Some images are from the AO and  
OTA fracture lecture series

# Ankle Fractures in the Elderly

- The Problem
  - Aging population
  - Multiple comorbidities
  - Poor soft tissue
  - Open ankle fracture in geriatric population has a 10% mortality at 1 year



# Ankle Fractures in the Elderly

- Fracture Specific Issues
  - Osteoporosis
  - Mobilization is challenging as many must weightbear after surgery
  - Fracture fixation requires specific strategies for osteoporotic bone

# Ankle Fractures in the Elderly

- Soft Tissue Envelope
  - Easily compromised due to comorbidities
  - Use principles of chronic wound care to get wounds to heal

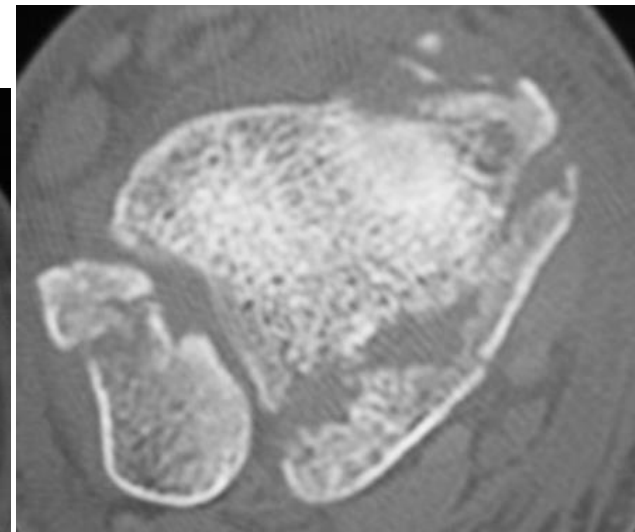
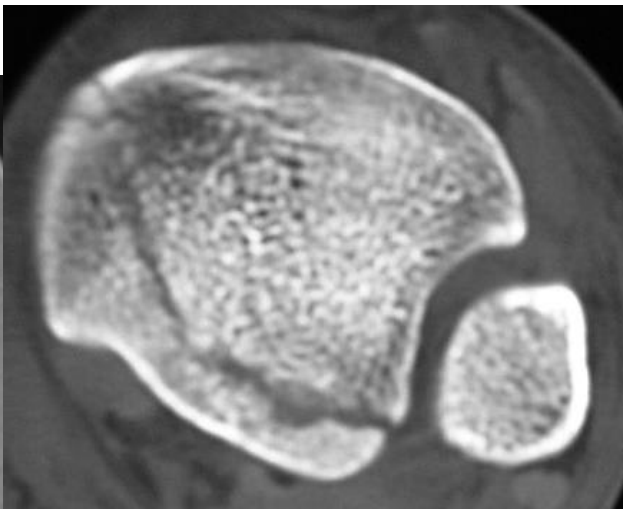
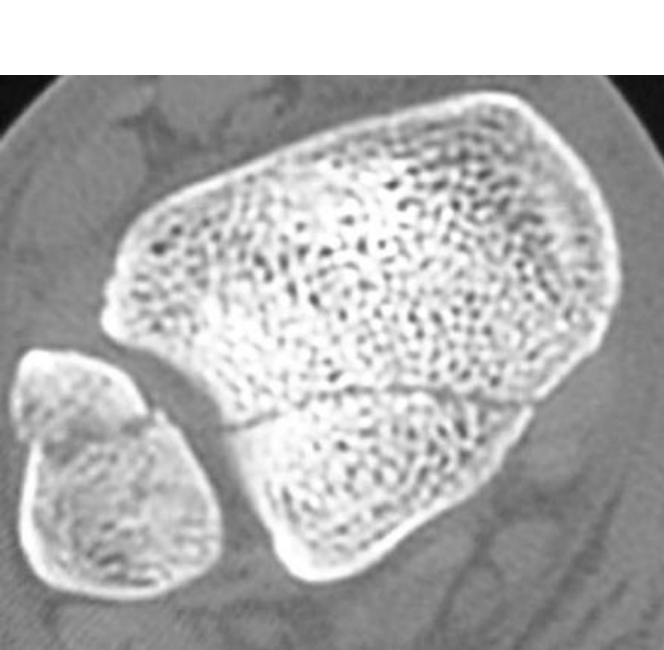


# Ankle Fractures in the Elderly

- Fixation Strategies
  - Fibula
  - Medial malleolus
  - Posterior malleolus
  - Anterolateral tubercle
  - Syndesmosis

# Ankle Fractures in the Elderly

- Fracture Assessment
  - X-ray of entire leg
  - Low threshold for CT scan to assess syndesmosis and posterior malleolus



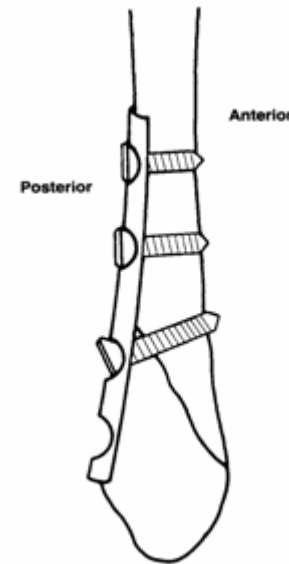
# Ankle Fractures in the Elderly

- Fibula Fixation
  - Weber B pattern is the most common
  - Know where to find the best bone quality for screw fixation
  - In areas of poor bone quality, use alternate fixations strategies



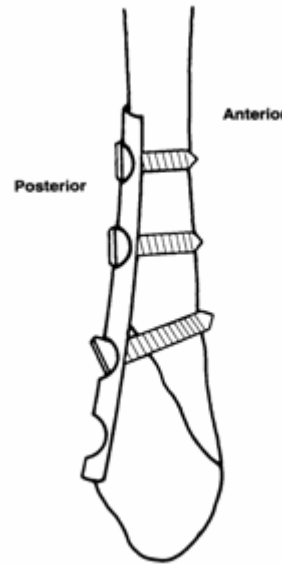
# Ankle Fractures in the Elderly

- Fibula Fixation
  - Best bone: Anterior cortex of proximal fragment
  - Worst bone: Posterior cortex of distal fragment



# Ankle Fractures in the Elderly

- Weber B Fracture
  - Antigliding plate
    - Plate substitutes for the poor bone quality of the posterior cortex of distal fragment
    - Screw threads purchase the anterior cortex where the bone quality is better
    - Mechanical studies show superior rigidity compared to the lateral neutralization plate
    - Also easier to close wound



# Ankle Fractures in the Elderly

- Fibula Fixation
  - Locking plates
    - Helpful when there is comminution
    - Allow smaller screws in distal fragment



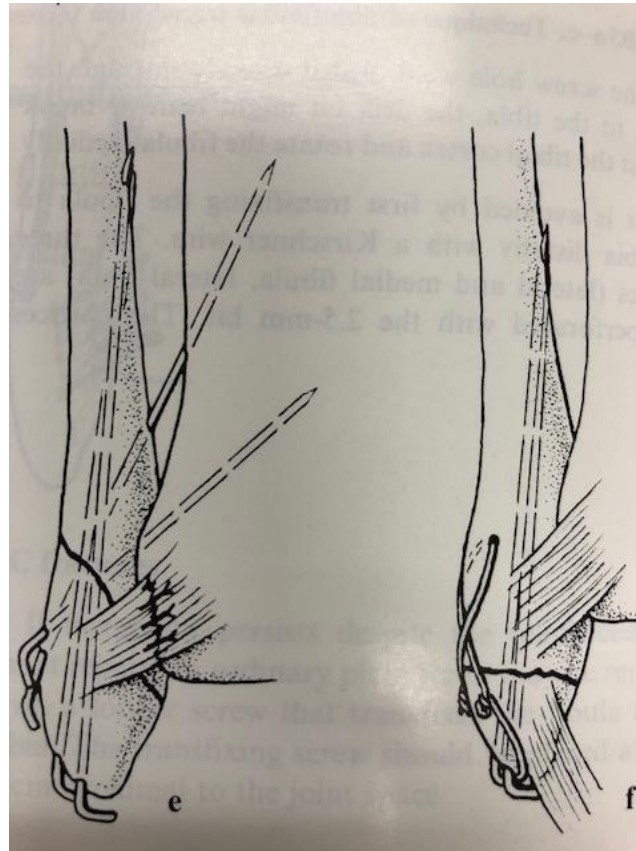
# Ankle Fractures in the Elderly

- Fibula Fixation
  - Intramedullary screw
    - Allows less dissection for fixation
    - No hardware to cover
    - Cannot do syndesmosis fixation



# Ankle Fractures in the Elderly

- Fibula Fixation
  - Other methods
    - K-wires/tension band
    - Hook plate
    - Augmentation



# Ankle Fractures in the Elderly

- Medial Malleolus Fixation
  - Metaphyseal bone proximal to fracture may be poor quality
  - Best quality bone in the epiphyseal scar, or the lateral cortex of the proximal fracture
  - Fracture fragment, best tissue may be the ligamentous attachment of the deep deltoid ligament

# Ankle Fractures in the Elderly

- Medial Malleolus Fixation
  - Partially threaded screws



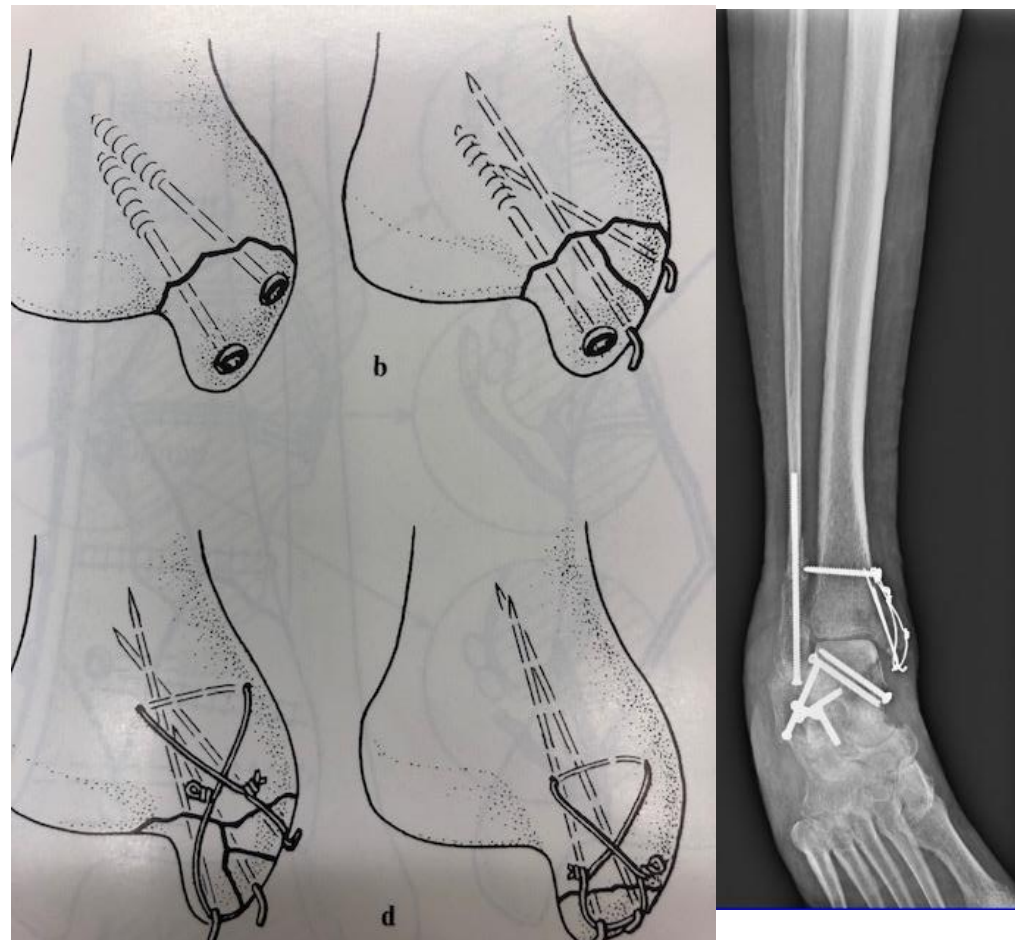
# Ankle Fractures in the Elderly

- Medial Malleolus Fixation
  - Smaller screws in comminuted fractures



# Ankle Fractures in the Elderly

- Medial Malleolus Fixation
  - Tension band in smaller or comminuted fractures



# Ankle Fractures in the Elderly

- Medial Malleolus Fixation
  - Long screw, bicortical fixation provides superior compression
  - Need to be careful with long drill bits—breakage
  - Screws can bend making removal difficult

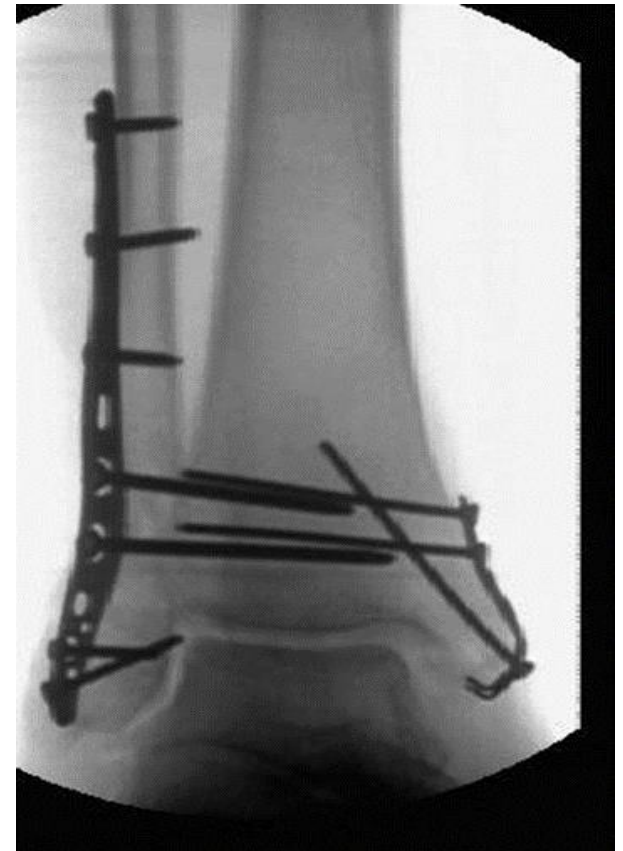


# Ankle Fractures in the Elderly

- Medial Malleolus  
Fixation
  - Medial buttress plate

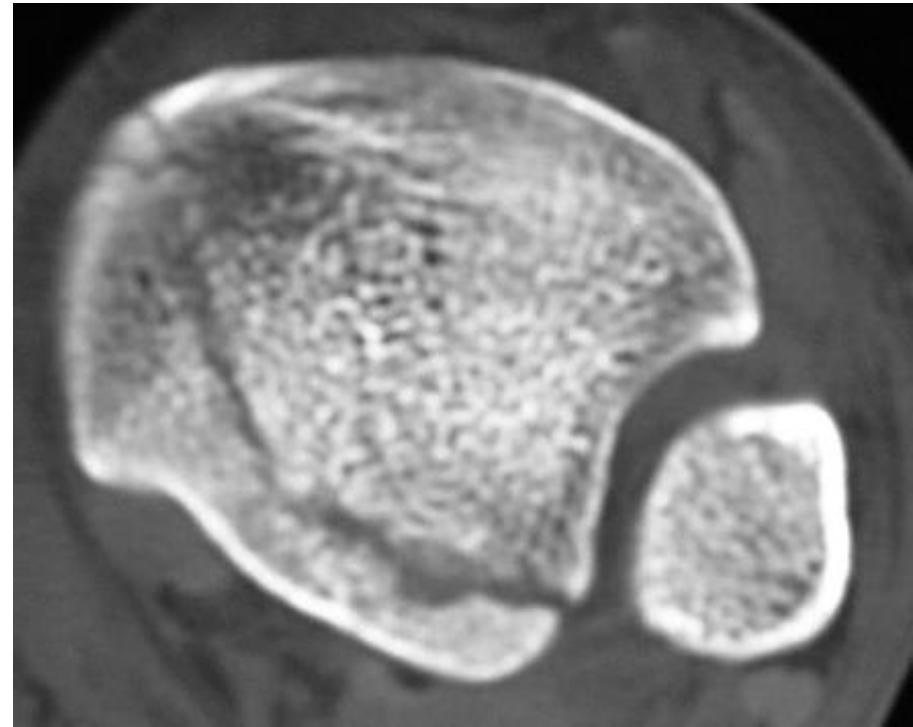
# Ankle Fractures in the Elderly

- Medial Malleolus Fixation
  - Hook plate
    - Make out of a 1/3 tubular plate for low profile



# Ankle Fractures in the Elderly

- Posterior Malleolus Fracture
  - Posterolateral position
  - Attached to the distal tib/fib ligament
  - Oftentimes larger than the appearance on plain x-ray
  - Usually not comminuted



# Ankle Fractures in the Elderly

- Posterior Malleolus Fracture Fixation
  - Direct approach
  - Key is patient positioning

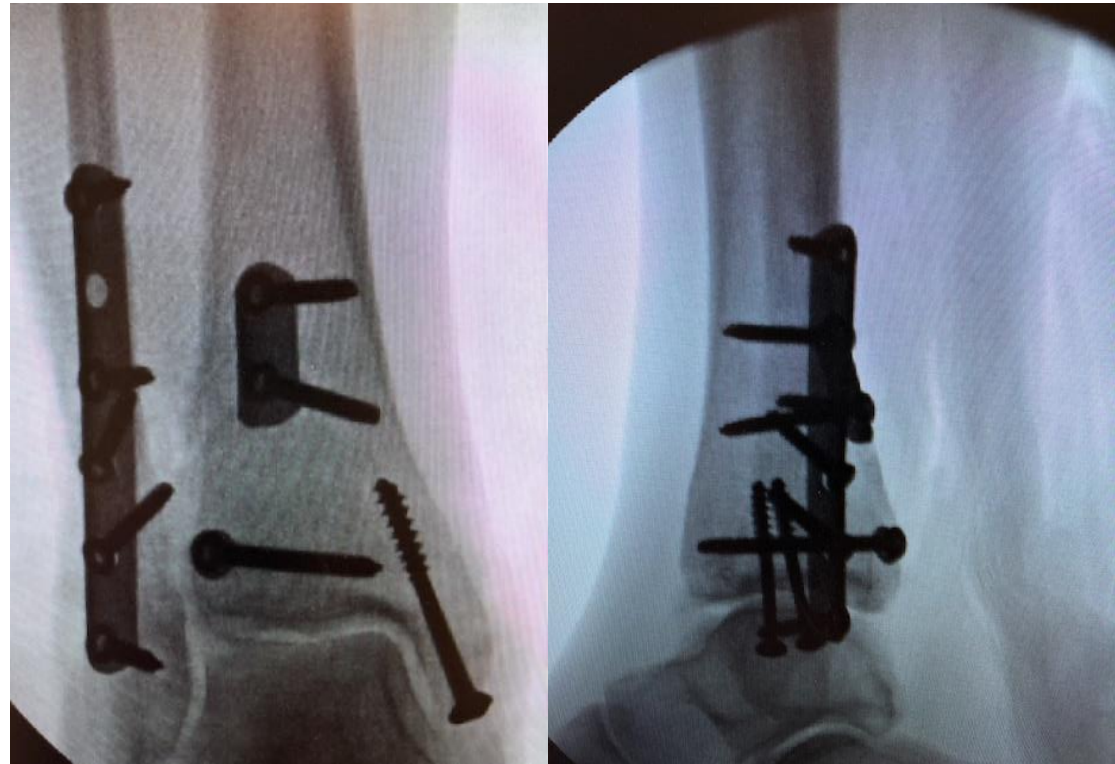
# Ankle Fractures in the Elderly

- Posterior Malleolus Fracture Fixation
  - Generally attached to the distal fibula by distal tib/fib ligaments
  - Reducing fibula will help reduce the posterior malleolus BUT don't block your vision of reduction with hardware on the fibula
  - Fixing posterior malleolus enhances accuracy of syndesmosis reduction



# Ankle Fractures in the Elderly

- Posterior Malleolus Fracture Fixation
  - Screws +/- washer
  - Buttress screw
  - Buttress plating



# Ankle Fractures in the Elderly

- Anterolateral Tubercle
  - Ligamentous attachment to fibula also helps contain fibula and improves reduction of syndesmosis



# Ankle Fractures in the Elderly

- Syndesmosis
  - Accuracy of reduction has been studied extensively
  - Malreduction common
  - Fixing posterior malleolus and anterolateral fragment helps with reduction

# Ankle Fractures in the Elderly

- Syndesmosis Fixation Techniques
  - Screw fixation, one or multiple
  - Suture button



# Ankle Fractures in the Elderly

- Soft Tissue
  - Check for associated flatfoot deformity
  - Check for tight heel cord
    - Associated with flat foot
    - Puts stress on fixation of external rotation generated fractures
    - *[Insert JPG] [Insert JPG]*

# Ankle Fractures in the Elderly

- Wound Care
  - Complications/delayed wound healing is common
    - Venous stasis
    - Neuropathy
    - Thin friable skin
    - Vascular insufficiency
    - Chronic lymphedema



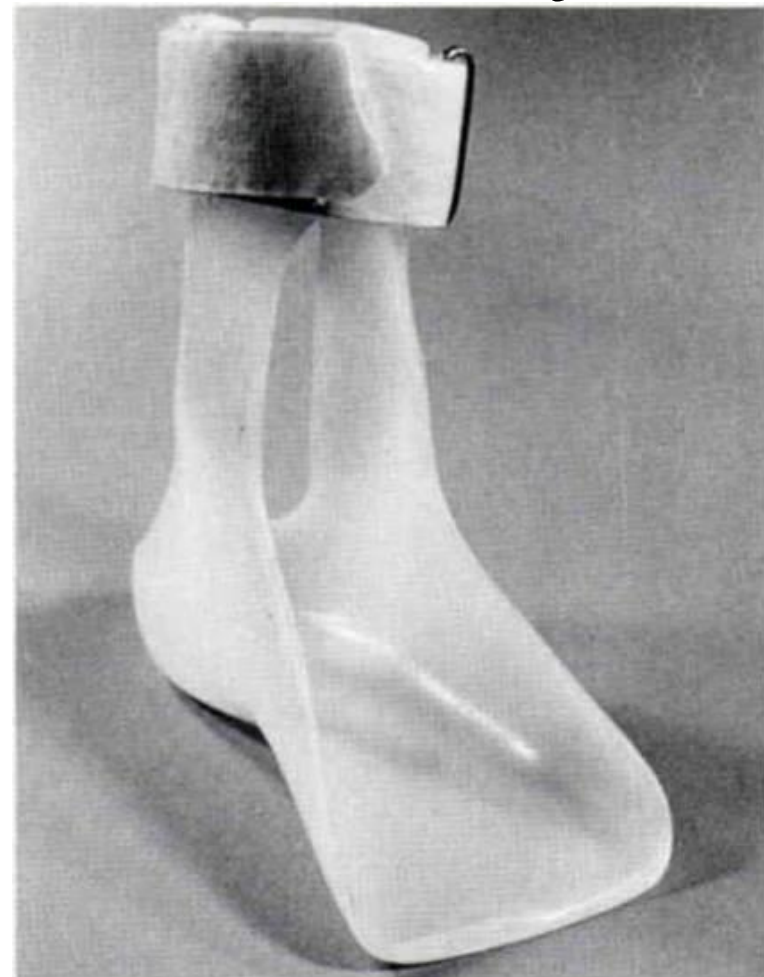
# Ankle Fractures in the Elderly

- Wound Care
  - Treat like a chronic wound
    - Compression/edema control
    - Antimicrobial dressing (silver)
    - Leave sutures in for 3+ weeks
    - No staples



# Ankle Fractures in the Elderly

- Immobilization
  - External support to allow some early weightbearing
  - Need to support fixation with foot in a functional position
  - Consider bracing with short molded AFO for 6-12 months



# Ankle Fractures in the Elderly

- Summary
  - Consider alternate fixation methods with poor bone quality
  - Buttress plates can substitute weak cortical bone
  - Slow progression of motion until wounds are stable/healed
  - Evaluate/address associated deformity that can compromise fixation

THANK YOU