Ep 01 Notes- Ankle Fractures- Dr. Stewart

Resurgens.com

"It's not the size of the dog in the fight, it's about the size of the fight in the dog"

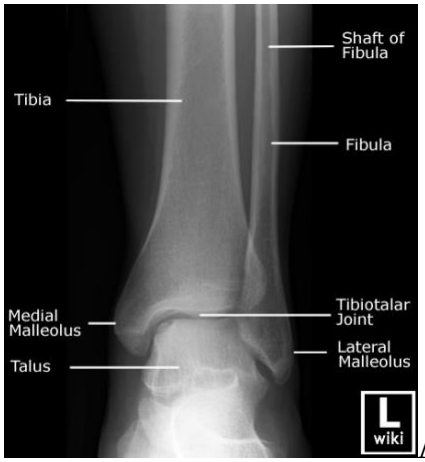
Case: 56 y/o obese female comes into the ER after a GLF complaining of ankle pain. Patient has an obvious ankle deformity

1. HISTORY/PHYSICAL EXAM

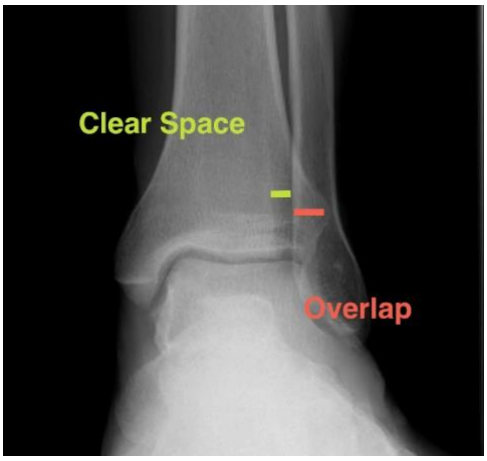
- History exam points
  - PMH (diabetes, etc.), PSH (Other incisions surround wound?,etc)
- PE's:
  - Inspect (Look for blisters, swelling, lacerations, exposed bone)
  - NV intact (Pulses and sensation)
  - Motor exam

2. RADIOGRAPHS

1. AP-
   a. Ankle in neutral, 25 degrees of internal rotation of ankle
   b. Normal tib-fib overlap >6mm
   c. Tib-fib clear space (normal<6mm)



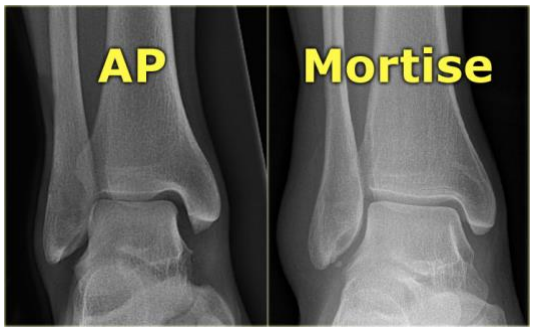
AP Ankle:From WikiRadiography



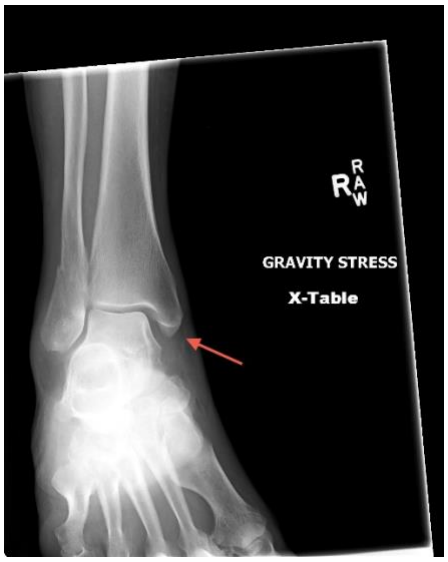
AP ankle- from the Bone School

2. Lateral-
    a. Look for posterior malleolus fracture

3. Mortise Views-
    a. Look for medial clear space (normal= or < 4mm),
    b. Distal Tib-Fib overlap (normal>1mm)



4. External Stress Views
    a. Gravity Stress-
        i. Patient lies on side, you look at fibula and see if fibular distracts with gravity pulling ankle down
        ii. Assess competency of deltoid ligament

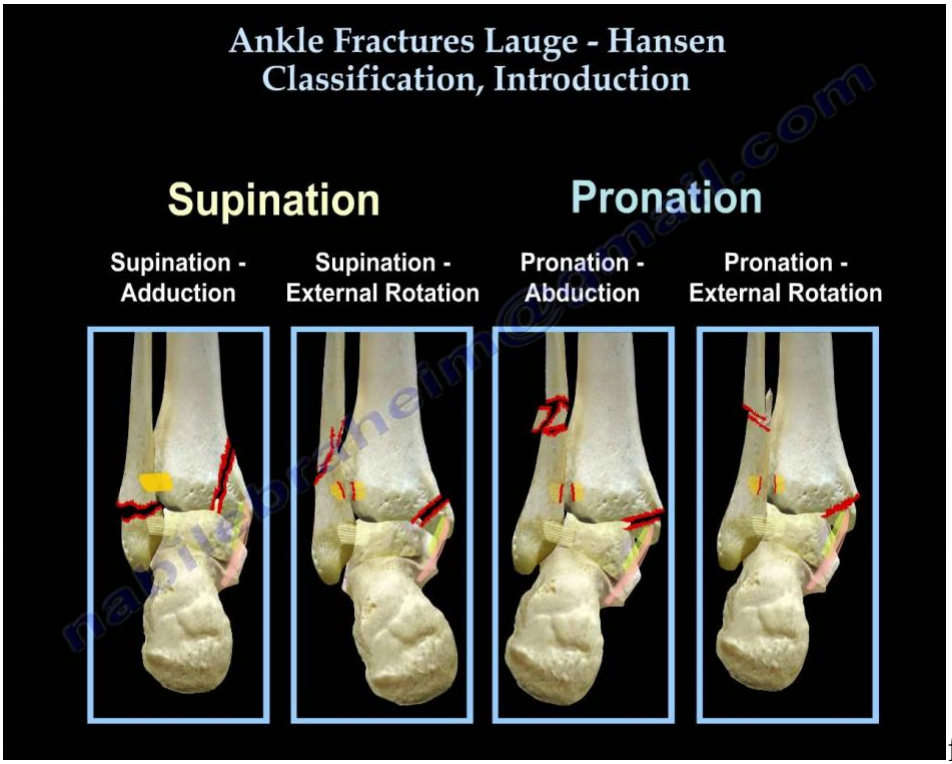


    b. External Rotation test- Typically under some form of anesthesia
        i. Assess competency of deltoid ligament and syndesmosis
            1. Medial clear space >5mm with ER

External Rotation view: from PAINE podcast and medical blog

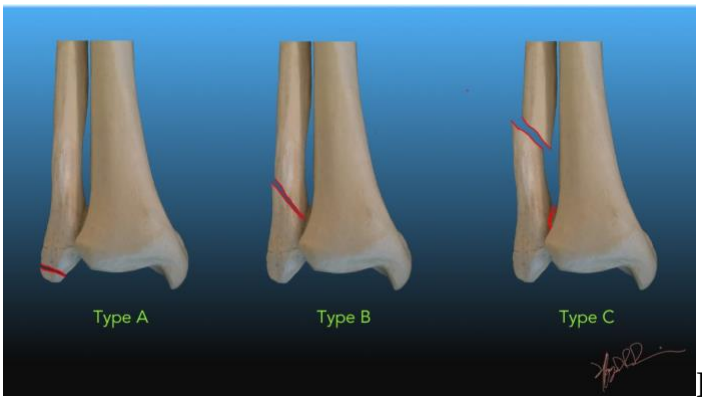
3. ANATOMY/MECHANISM/CLASSIFICATION

- Lauge- Hansen (based on foot position & force of applied stress/force)
    - Supination adduction
        - Gives vertical shear on tibia



from- YouTube Dr. Nabil Ebraheim

- Danis-Weber/ AO (location of fibula fracture)
    - A- Infrasyndesmotic
    - B- Transsyndesmotic
    - C- Suprasyndesmotic



Danis Weber Classification- From faculty.washington.edu

- Anatomic/ Descriptive
    - Bi-Malleolar (2 of 3 malleoli are fractured- it can be Fibula + posterior mal, lateral mal + medial mal)
    - Isolated Lateral Malleolar
    - Isolated Medial Malleolar
    - Displaced Fracture (Unstable vs Displaced by 2mm)
    - Bi-malleolar equivalent (Lateral malleolus + deltoid ligament injury)
    - Tri-malleolar

Video Explaining Lauge-Hansen Classification system:
https://www.youtube.com/watch?v=6aF-PIYDxF0

4. TREATMENT

Non-Operative Indications (short-leg walking cast/boot)

- Isolated lateral malleolar fx with 2mm< of displacement-w/o medial malleolar involvement (depends on stability)
- Isolated nondisplaced medial malleolus fracture or tip avulsions
- Posterior malleolar fx with <25% joint involvement or <2mm step off

Generally fix fibula first- it will give you length you need
- Unless>> Fibula is severely comminuted

Operative Indications

- Talar displacement
- Displaced isolated medial malleolar fracture
- Displaced isolated lateral malleolar fracture
- Bimalleolar fracture and bimalleolar- equivalent fracture
- Open fracture
- Trimalleolar fx
- Syndesmotic Injury
- Posterior malleolus fracture >25% joint involvement or instability

Operative Treatment

Fibular fx

- Lateral> Avoid superficial peroneal nerve
- Tx- lag screw/lateral plate

- Posterior> (anti-glide technique)> posterior plate

Medial Mal

- Screws
- Tension band + K-wires
- Washer + screw

Posterior Mal (you want rigid fixation)

- Helps give syndesmotic ligaments
- Disadvantage is peroneal irritation if plate is too distal

Syndesmosis

- Anatomic reduction is important
- Suture button techniques
- Cortical screw fixation

If Diabetic patient?

- From PE, Have done your Swans monofilament test done
- Tend to be more aggressive with fixation (ex: transyndesmotic screws, medial mal screw put in to lateral cortex of tibia)
- Keep them NWB generally for a longer time

5. PROGNOSIS

- Wound problems
- Deep infections
- Malunion
- Post-Traumatic Arthritis
- It may take up to a year to become fully functional

Notes made from:

Nailed It Ortho podcast episode 1
Orthobullets.com
AAOS Comprehensive Orthopaedic Review

Orthopaedic Secrets

Some Articles to read:

1. Ramsey, P. L., & HAMIlTON, W. I. L. L. I. A. M. (1976). Changes in tibiotalar area of contact caused by lateral talar shift. *JBJS*, *58*(3), 356-357.
2. Herscovici Jr, D., Scaduto, J. M., & Infante, A. (2007). Conservative treatment of isolated fractures of the medial malleolus. *The Journal of bone and joint surgery. British volume*, *89*(1), 89-93.
3. Egol, K. A., Pahk, B., Walsh, M., Tejwani, N. C., Davidovitch, R. I., & Koval, K. J. (2010). Outcome after unstable ankle fracture: effect of syndesmotic stabilization. *Journal of orthopaedic trauma*, *24*(1), 7-11.
4. Matuszewski, P. E., Dombroski, D., Lawrence, J. T. R., Esterhai Jr, J. L., & Mehta, S. (2015). Prospective intraoperative syndesmotic evaluation during ankle fracture fixation: stress external rotation versus lateral fibular stress. *Journal of orthopaedic trauma*, *29*(4), e157-e160.