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Adult Foot & Ankle Surgery

Common fractures of the foot and ankle

John P. Negrine, FRACS
Foot and ankle Surgeon
Orthosports, Sydney



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Based on last year's feedback – thank you

- This fracture topic was popular
- You would like me to speak faster
- You all enjoyed my politically incorrect sense of humour
- I should be cancelled



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Not a lecture about plates and screws



Diagnosis of fracture

History and mechanism of injury

Physical examination

Investigations



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**“You see what you look for and
recognise what you know”**

The tragedy of missed diagnosis



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You do have to talk to the
patient



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History

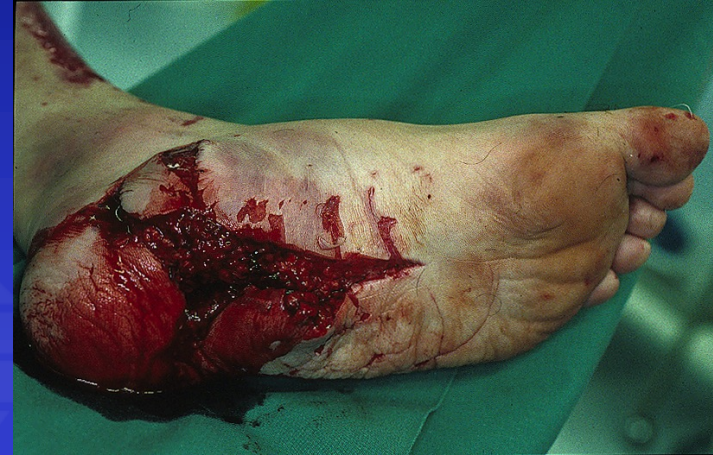
- Major Vs Minor trauma
- Ability to continue at sport
- A crack heard is not always a fracture



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Physical Examination

- Look for point tenderness over bone
- Swelling
- Deformity
- Loss of joint movement



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You must examine the patient



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Investigations – all have their strengths

- Plain x-ray in at least two planes, including the joints above and below of good quality
- Bone scanning
- CT Scanning
- MRI Scanning



MRI no plain xray



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Upselling investigations

- Always start with plain xrays
- Beware of the “upsell”



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CT Scanning

- The best way to image a fracture in 2023
- Bone is water poor and calcium rich
- Allows fine detail in multiple plains
- Will not see cartilage



CT of foot fractures



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MRI scanning

- Depends on water content in tissues
- Better for ligament, tendon, cartilage
- Detail not as good for bone

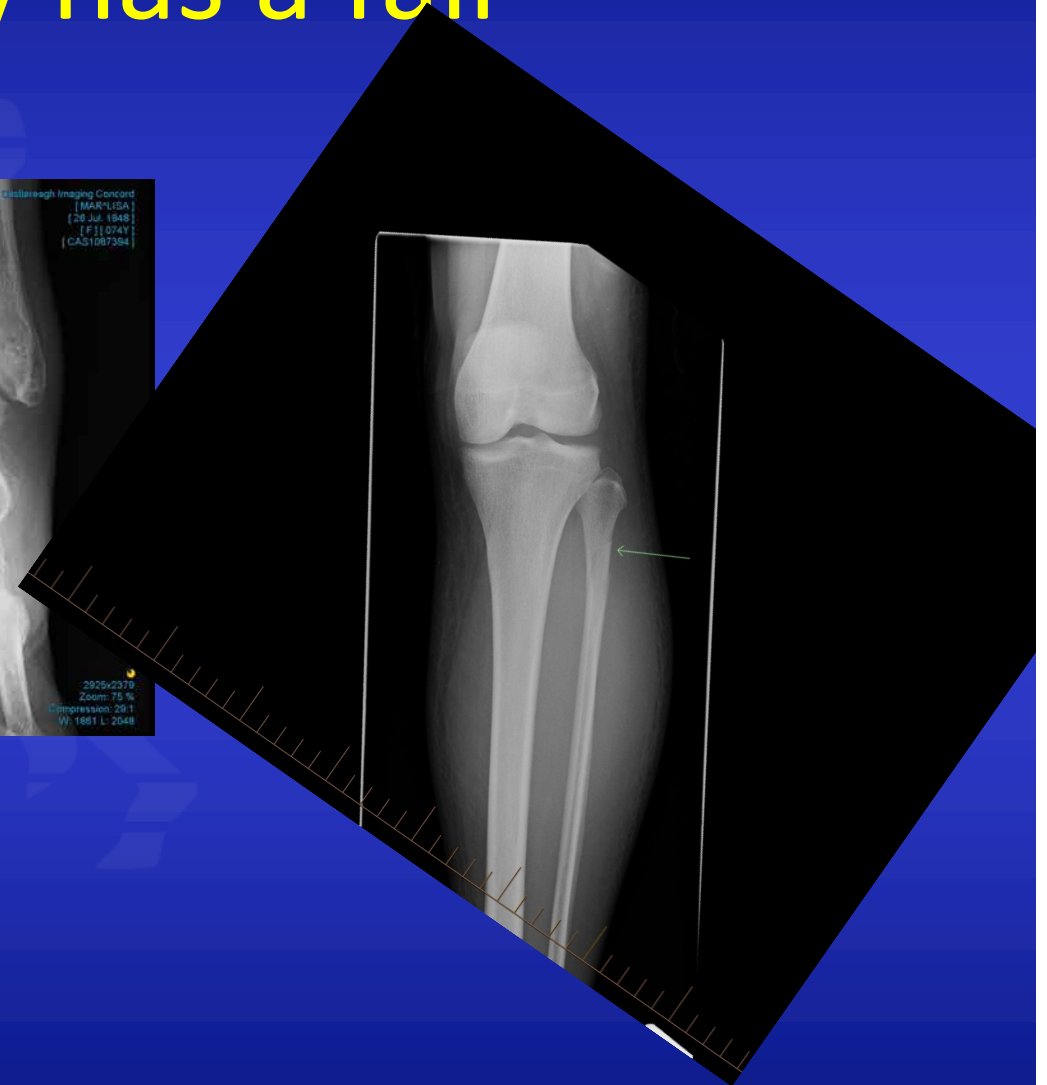


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74yo lady has a fall



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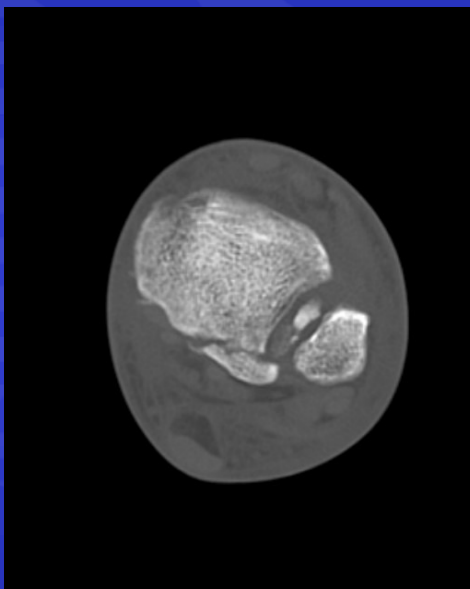
Lateral view



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Ankle fractures

- Commonly seen in compression as well as rotation injuries
- Were classified according to mechanism of injury by Lauge-Hansen
- More often classified according to the level of the fibular fracture (AO classification)



Ankle fracture anatomy

- Fractures below the syndesmosis are often ligament avulsions
- Fractures at the syndesmosis often rotational
- Fractures above are more unstable



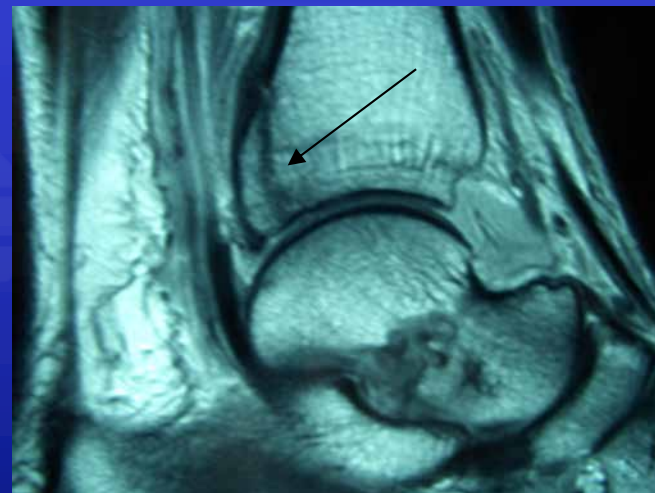
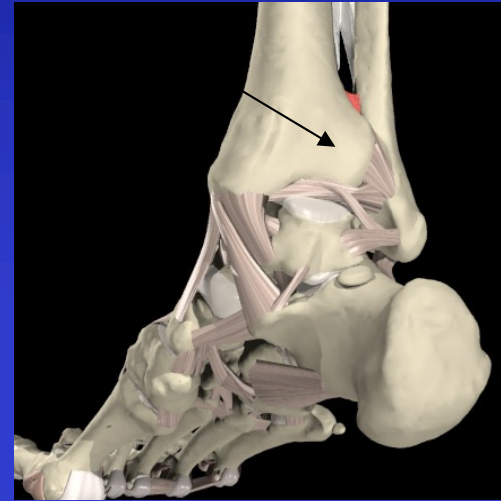
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The posterior malleolus

- The dorsal portion of the tibial articular surface
- Attachment of the posterior inferior tibio-fibular ligament
- A frequent site of avulsion fracture



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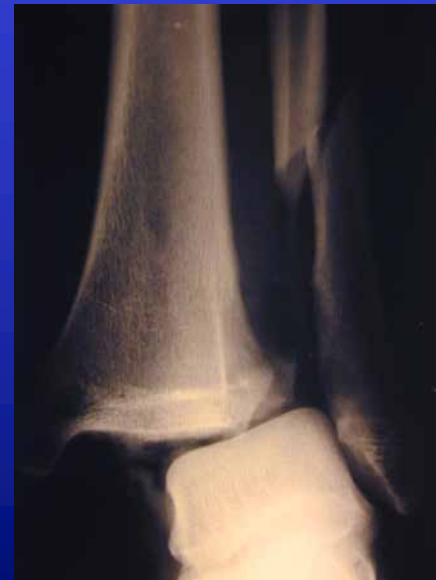
Weber classification and it's significance

- Type A below the syndesmosis tend to be stable
- Type B at the syndesmosis may be stable or unstable (medial injury important)
- Type C above the syndesmosis tend to be unstable



The x-ray that should never be taken

- An obvious dislocation
- Leaving this dislocation will result in skin breakdown medially
- Reduce the dislocation ASAP with pain relief –
Then x-ray at leisure



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Weber A

- Below the syndesmosis
- Ligament avulsions
- Nearly always stable



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Weber B fracture



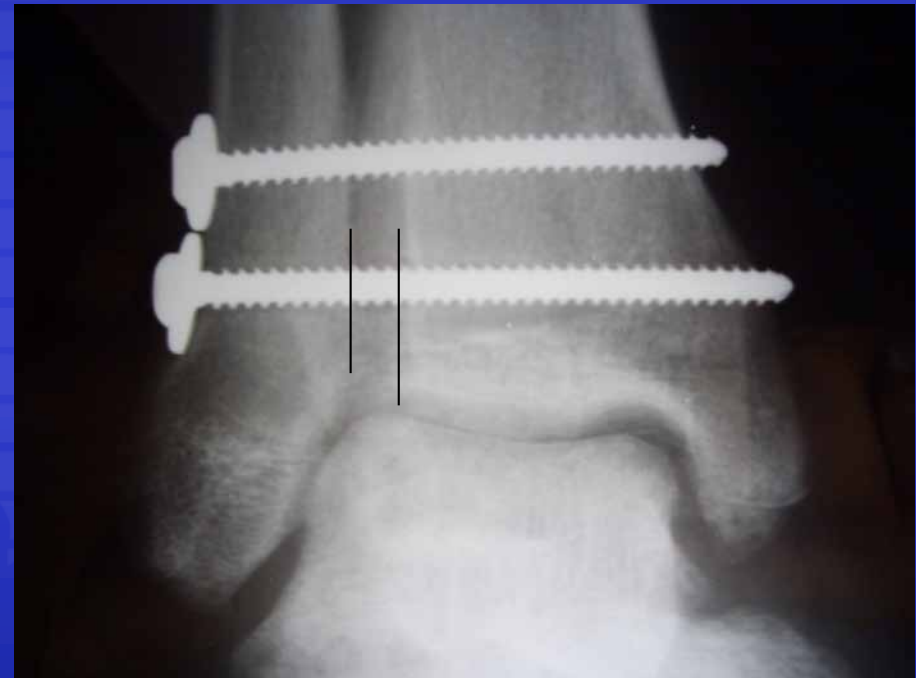
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Weber C injury



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Weber C – tightrope fixation



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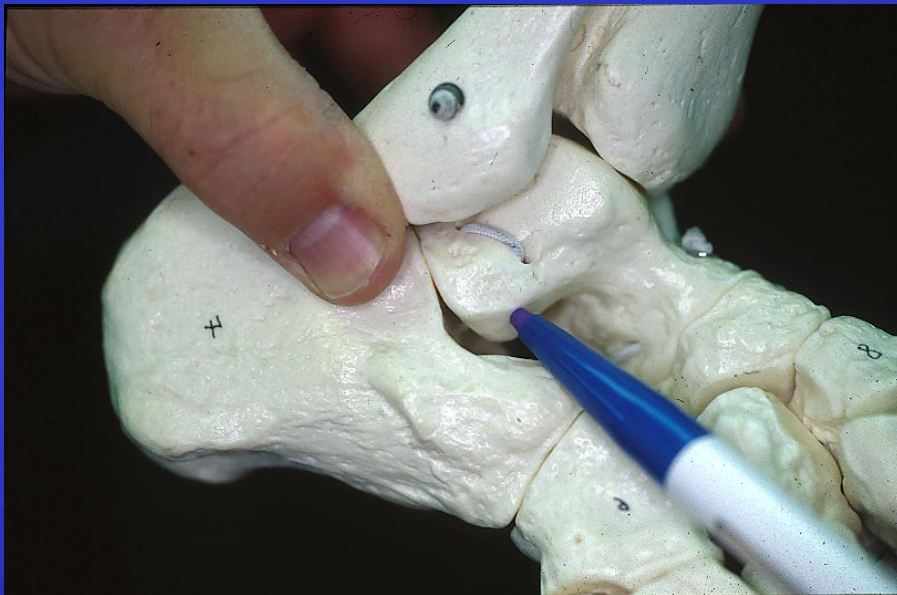
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Talar fractures

- Less than 1% fractures
- High energy...MVA, fall from horse, aviator's astragalus
- Lateral process increasingly seen in snowboarders
- Talar dome seen in ankle sprains
- Always image with CT



Talar fractures



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Calcaneal fractures

- Most common is anterior process avulsion
- Major fractures seen in fall from height and associated with lumbar spine fractures
- Major advances in internal fixation techniques – Seattle rains 40”/year



Joint involvement requires review

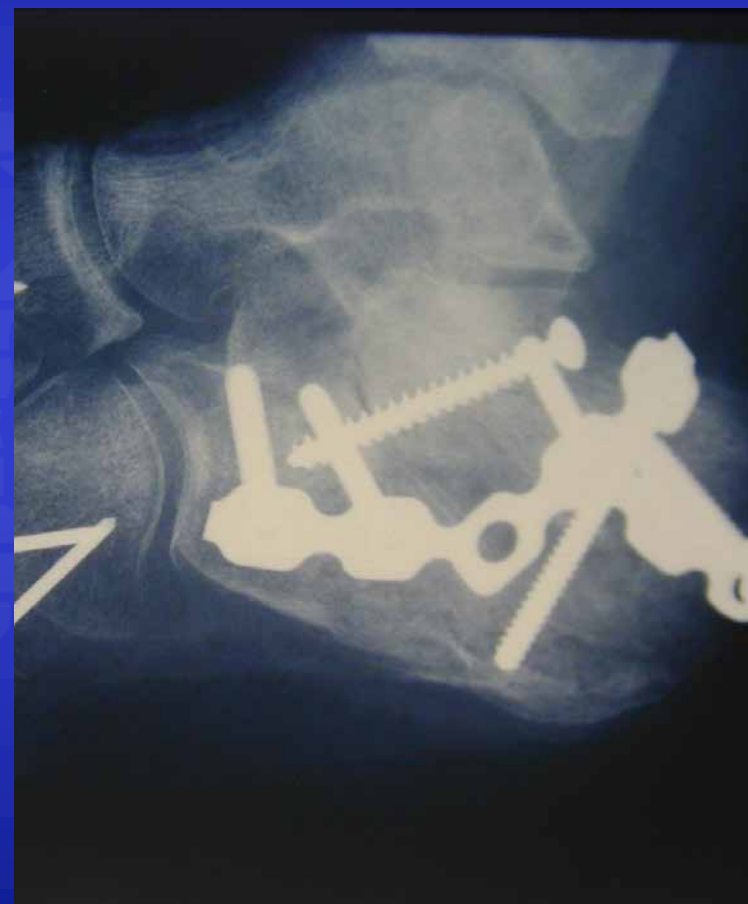
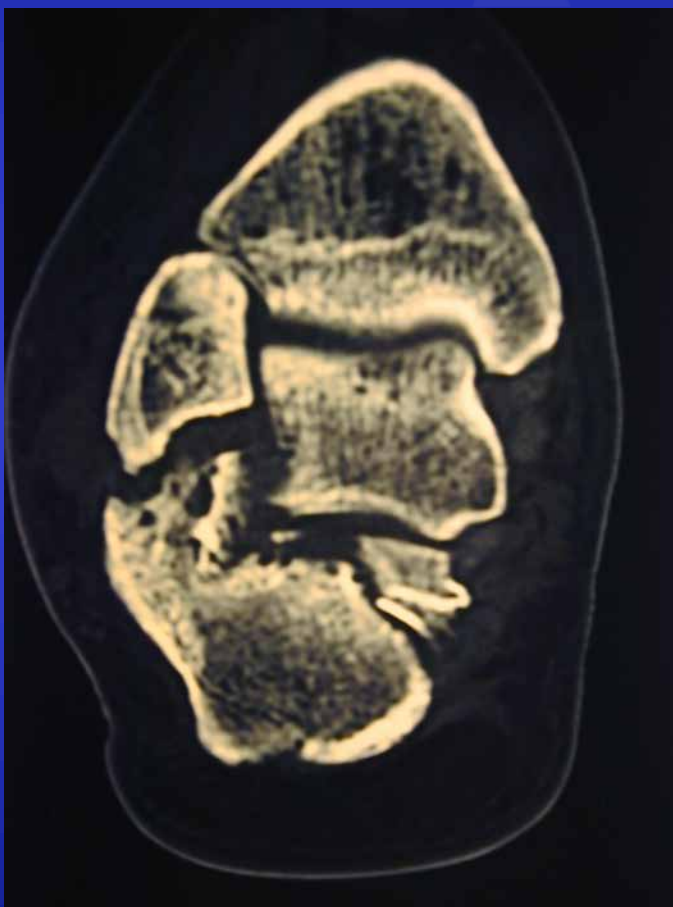


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Reduction and fixation



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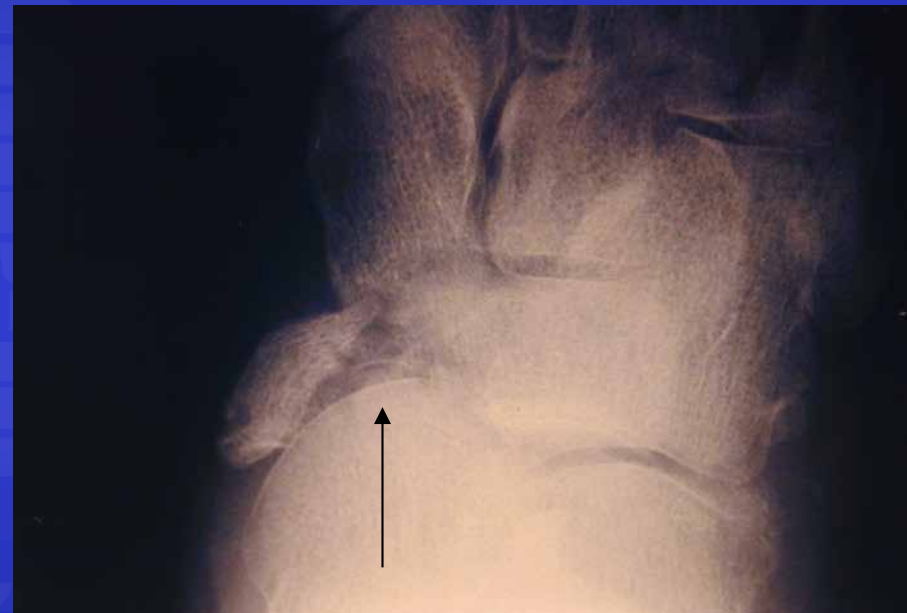
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Navicular fractures

- Unusual except for dorsal avulsions
- Major compression forces which often also fractures cuboid or anterior calcaneus
- Results of treatment very poor



Navicular fractures



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Navicular stress fracture

- Midfoot pain
- Common in athletes who impact load....hurdlers, javelin throwers
- Diagnosis often missed



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Cuboid fracture

- Articular or non-articular
- Important to keep length of lateral column

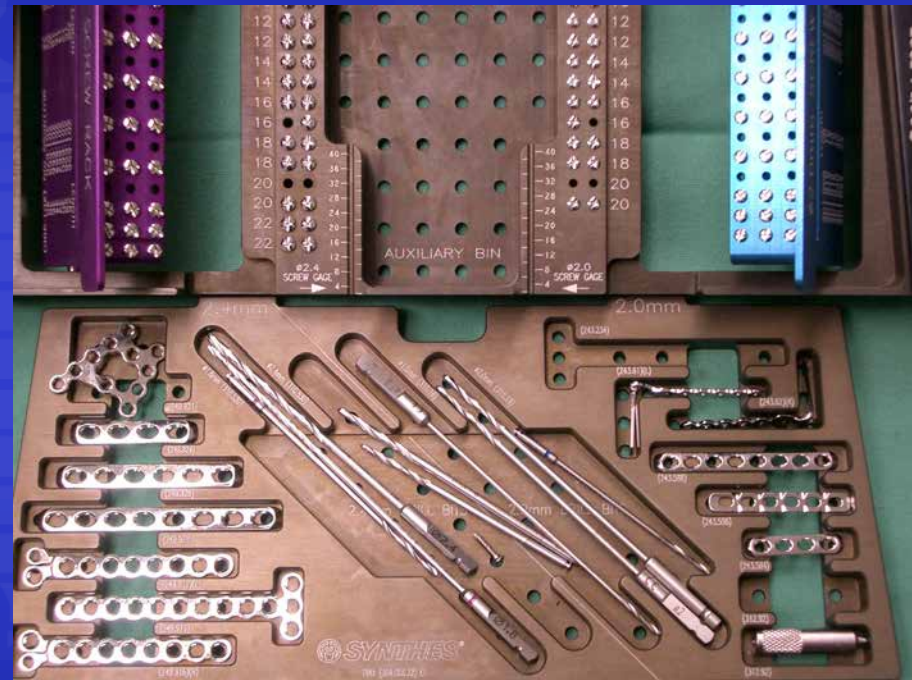
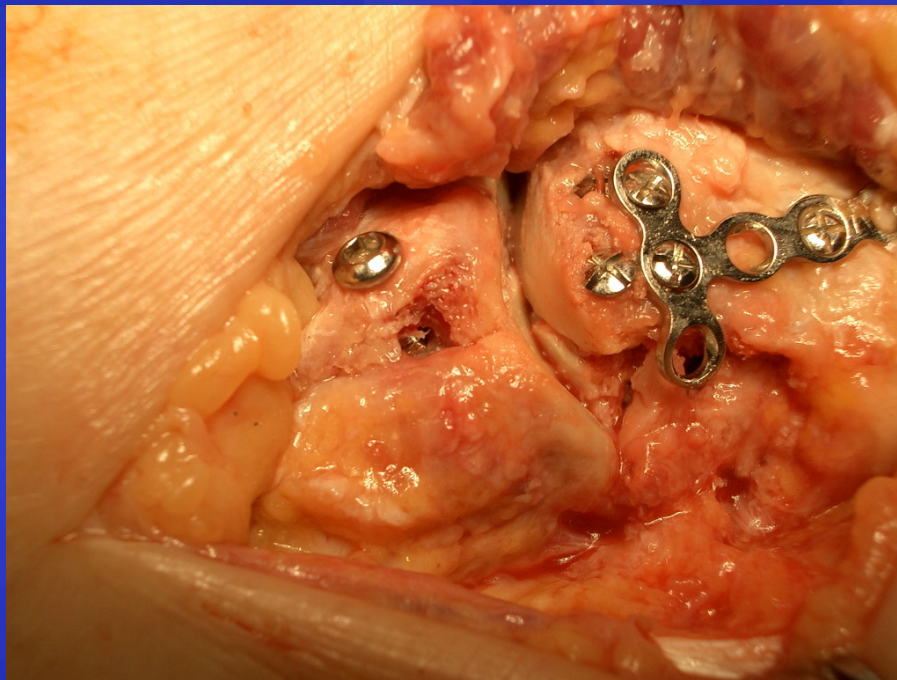


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Cuboid fracture fixation



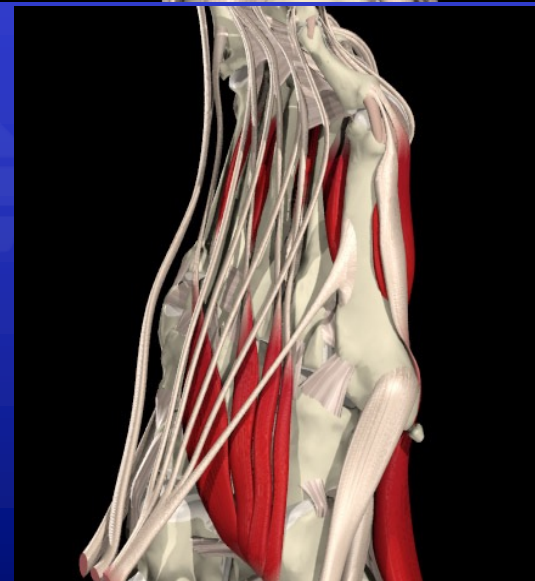
Fractured 5th metatarsal

- The commonest foot fracture
- Tuberosity fracture - benign
- Shaft fracture - benign
- Jones fracture - nasty



5th metatarsal anatomy

- Base is joined to cuboid/4th metatarsal by ligaments
- Peroneus brevis inserts at tubercle
- Peroneus tertius inserts at dorsal shaft



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Tuberosity fracture

- Associated with ankle sprains
- Will become painless even if bony union does not occur
- A fracture through cancellous bone
- Don't wait for callus!!



Shaft fracture

- Often spiral
- Some call them the “dancer’s” fracture
- Do well without surgery even if comminuted



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Jones fracture

- At the diaphyseal – metaphyseal junction
- Between cancellous and cortical bone
- A vascular watershed
- Manage in a cast non-weightbearing for 6 weeks and 25% incidence of non-union
- Consider immediate ORIF in athletes



Jones fracture – Non-union



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Non-union treatment

- Internal fixation
- Add bone graft to fill the defect
- 6 weeks in cast
- Address hindfoot varus
- Return to sport when united as assessed by CT scan



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Isolated single metatarsal

- Exclude Lisfranc injury
- Manage symptomatically
- Very rarely cause problems



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Toe fractures

- If bent straighten under local
- Consider ORIF if great toe and articular involvement
- Warn patients that toes will swell for 6/12
- Coban tape useful to decrease swelling



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