1. The most common ligament injured in an ankle sprain is?

A. Talocalcaneal
B. Calcanealfibular
C. Deltoid
D. Anterior Talofibular
E. Achilles
2. Regarding ankle radiographs the following is true:
   A. AP and Mortise view are standard series
   B. Sprains Always requires x-rays
   C. Palpation of lateral foot is part of the Ottawa ankle rules
   D. A negative x-ray excludes fracture
   E. Unilateral lateral malleolus fx above the Tibioltalar joint are usually stable

3. Regarding Achilles tendon rupture the following is true?
   A. Caused by forced dorsiflexion against plantar flexed foot
   B. Most common in children
   C. Steroid use is treatment of choice
   D. Squeezing the calf will cause foot dorsiflexion
   E. Surgical management is mandatory
4. Non-operative management is most appropriate for which of the following?
   A. Posterior malleolar fractures with 30% of tibial surface
   B. Bimalleolar Fractures
   C. Pilon Fractures
   D. Unilateral lateral malleolar fracture below the tibiotalar joint
   E. Medial malleolar fracture with tenderness at proximal fibula

5. Which of the following is correct regarding metatarsal shaft fractures?
   A. 1st metatarsal is the most common shaft fracture
   B. 2nd is the most serious shaft fracture
   C. < 10° degree apex dorsal angulation is acceptable
   D. 1st requires surgery less often then metatarsal 2-4
   E. Metatarsal head/neck fracture require surgery less often
6. A 25 y/o male complaining of severe pain foot after a wake board fall presents to the ED. X-ray shows a fracture of the base of the 2nd metatarsal. What is true regarding this injury?

A. Is usually stable
B. Cuboid fractures are uncommon
C. Surgery is usually optional
D. Delayed diagnosis results in significant complications
E. Involves disruption of the subtalar joint

7. A ballet dancer presents to the ED complaining of lateral foot pain for 3 weeks after running a marathon. X-ray is negative. What is the most appropriate next step?

A. Ace wrap and ortho follow-up
B. Non weight bearing short leg splint, schedule out patient MRI, and ortho follow-up
C. Orthopedic shoe, and ortho follow-up
D. Steroid injection, and ortho follow-up
E. Non weight bearing short leg splint, CT scan and orthopedic follow up
8. A 35 y/o F twists her ankle going down the stairs. She was able to bear weight but complains of pain and swelling. Which is correct regarding ankle sprains?

A. Fracture of the base of 1st metatarsal should be considered  
B. Talar dome injuries can occur  
C. Grade III sprains result in partial ligament tears  
D. Most require splining and non-weight bearing for 2-3 weeks  
E. Associated with severe pain with passive dorsiflexion of 1st toe

9. Which of the following dysrhythmias is associated with commotio cordis?

A. Asystole  
B. Atrial fibrillation  
C. PEA  
D. V-Fib  
E. Sinus tach
10. Which is the most common cause of bowel obstruction in children?

A. Adhesions
B. Hernia
C. Intussusception
D. Mid gut volvulus
E. Malrotation
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    C. Intussusception
    D. Mid gut volvulus
    E. Malrotation
Key Movements

- Inversion
- Eversion
- Plantar flexion
- Dorsiflexion
- Rotation
Mechanism of Injury

- Inversion
- Eversion
- Axial Loading
- Tendon Stretching + muscle contraction

• Inversion
  - Sprain
  - Fracture (stable vs. Unstable)
  - Avulsion
**Mechanism of Injury**

- **Eversion**
  - Posterior tibias rupture
  - Navicular Avulsion fracture
- **External rotation + Dorsiflexion**
  - Deltoid ligament injury (isolated rare)
  - Lateral malleolusFx
  - Prox fibula fracture

- **Axial Loading (Ankle)**
  - Tibia
  - Talus
  - Calcaneus
- **Associated injuries common**
  - Tibial plateau
  - Prox Femur/ acetabulum
  - Lumbar Vertebrae
  - Compartment syndrome

**Content Topics**

- **Anatomy**
  - Hx/ PE
- **MIO**
- **Specific Inj.**
  - Ottawa Ankle rules
- **Radiology**
- **Ankle Injuries**
- **Foot Injuries**
- **Misc.**
Specific Mechanism of Injury

- Achilles tendon rupture
  - Forced Dorsiflexion + muscle contraction
  - Foot push off with knee extension (out of the blocks)
- Lisfranc Fx dislocation
  - Rotation on fixed forefoot
  - Axial load hind foot/mid foot into Metatarsal bases
  - Crush

Ottawa Ankle Rules: XRAY?

A series of ankle x-ray films is required only if there is any pain in malleolar zone and any of these findings:
  - Bone tenderness at A
  - Bone tenderness at B
  - Inability to bear weight both immediately and in emergency department

A series of ankle x-ray films is required only if there is any pain in mid-foot zone and any of these findings:
  - Bone tenderness at C
  - Bone tenderness at D
  - Inability to bear weight both immediately and in emergency department
Specific Findings

- Palpate for Fibular fracture
- Maisonneuve fracture

Radiology
- Standard
- Specific findings
- Advanced Imaging
  - Ankle Injuries
  - Foot Injuries
  - Misc

Anatomy

MOI / PE

< 5mm

< 4mm

Maisonneuve fracture
Advanced Imaging

- Negative x-ray - No Fracture
- CT
  - Mid/hind foot
    - Talus/Calcaneus
    - Subtalar joint
    - Lisfrac Joint complex
- MRI
  - Tendon ruptures
  - Stress Fractures considered

Lateral Malleolar

- Predicts value of Operative repair
- Fib FX to Tibialtalar joint
  - Below nonoperative
  - At Level: Depends on stability
  - Above usually require surgery
Medial Malleolar

- Eversion + external rotation
- Avulsion fracture
- Deltoid ligament tear
- Isolated fracture uncommon
- Proximal fibula may be fractured

Posterior Malleolar

- Rare
- > 25% Tibial surface require surgery
  - Bi - Tri Malleolar
    - Disruption of 2 elements of ankle ring
    - Bi: Operative vs. non operative ?
    - Tri: Operative
Ankle Sprains

- Inversion Plantar flexion
- Isolated Talofibular ligament (2/3 sprains)
- Isolated deltoid ligament (5%)
  - Eversion + external rotation
  - R/O Maisonneuve or Weber C Fracture
  - Attention to mortise measurements

Achilles Tendon Rupture

- Pop or snap
- Weak plantar flexion possible (P.Tibialas, toe flexors)
- Thompson Test (intact tendon)
  - Knee flexed 90°
  - Calf squeezed
  - Foot plantar flexes
- Operative vs. non-operative?
Talar Fracture
- Joint less stable plantar flexed foot
- High risk avascular necrosis
- 2nd most common tarsal bone fx
- Neck Fx 50%, extreme dorsiflex (MVC)

Sub-Talar Dislocations
- Medial most common
- Rapid closed reduction
- Avascular necrosis uncommon
Calcaneal Fractures

- Assessment
  - Subtalar involvement
  - Bohler’s angle (degree of depression of posterior facet)
    - $20^0$-$40^0$ normal.
    - $<20^0$ abnormal
- Operative vs. Non ??

Navicular Fractures

- Eversion
  - Dorsal avulsion
  - Tuberosity avulsion
- Axial loading
  - Body fracture
- Middle third avascular
  - Nonunion
  - AVN
Lisfranc Fx and dislocation

- Tarsal-metatarsal joint
  - Metatarsal base fracture
  - Metatarsal dislocation
- Delay in diagnosis associated with long-term morbidity
- Usually 2° MVA
- Second metatarsal is critical for stability of the midfoot (both transverse and longitudinal arches)
- May require ORIF
Fifth Metatarsal Base Fracture

- **Tuberous Fracture**
  - Dancer's
    - Avulsion fracture base of 5th metatarsal tuberosity
    - At attachment of peroneus brevis
    - Inversion injury
    - Cast shoe only
  - Jones'
    - Transverse fracture 15mm distal from prox end
    - Proximal diaphysis
    - Common in athletes
      - Running or jumping sports
    - Increased incidence nonunion
    - ORIF or cast
CONTENT TOPIC 1

Insert key points for ITE review here