Common Fractures

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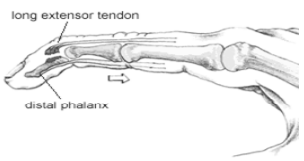
Finger

MALLET FINGER(Baseball Finger)



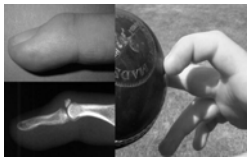
- **Avulsion of Extensor Digitorum Communis (EDC) Tendon from DIP joint**
  PITFALL – get the films
  - **Can be associated with Avulsion Fracture**

Common Fractures

- **Distal Upper Extremity**
  - **Fingers, Hand, Wrist**
- **Proximal Upper Extremity**
  - **Humerus, Shoulder, Clavicle**
- **Proximal Lower Extremity**
  - **Hip, Femur**
- **Distal Lower extremity**
  - **Knees, Ankle, Feet**

Finger

MALLET FINGER



- **Mechanism of Injury:**
  - **Direct jam**
  - **Forced flexion**
  - **Dorsal dislocation of PIP**
  - **Laceration**
- **Splint**
  - **Slight hyperextension for 6 weeks**
  - **Night splint for additional 6 weeks**
  - **Best results if treated early**

Jersey Finger

Finger

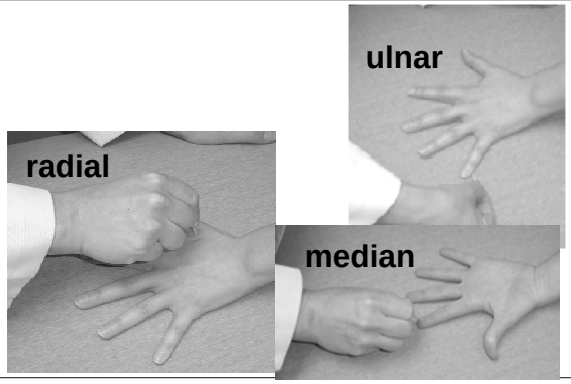
JERSEY FINGER

- **Avulsion injury of Flexor Digitorum Profundus (FDP) from volar base of distal phalanx**
- **Examination:**
  - **FDP test - blocked flexion of DIP**
- **Treatment - early surgical repair**
- **Permanent disability if missed**

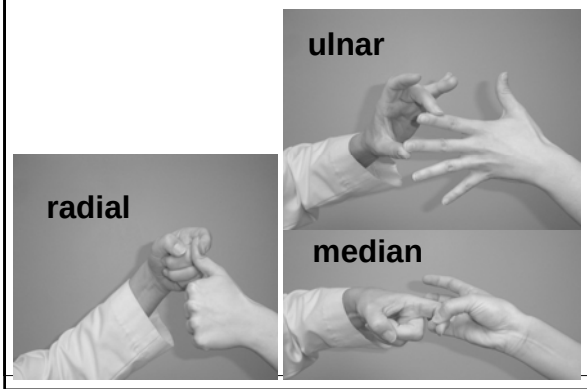
Jersey Finger

- **A pop or rip felt in the finger at the time of the injury**
- **- Pain when moving the injured finger and the inability to bend the last joint**
- **- Tenderness, swelling and warmth of the injured finger**
- **- Bruising after 48 hours**
- **- Occasionally a lump felt in the palm of the finger**

Neuro Hand Sensation



Neuro Hand Strength

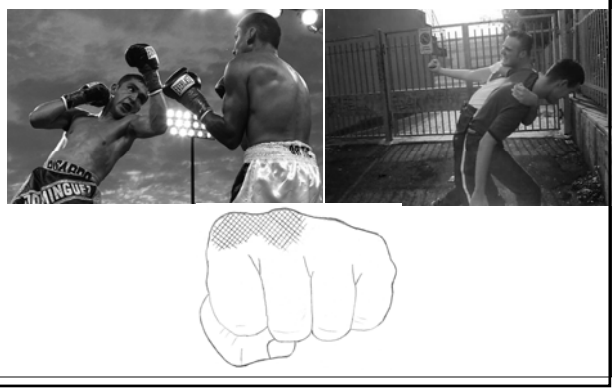


Boxer's Fracture

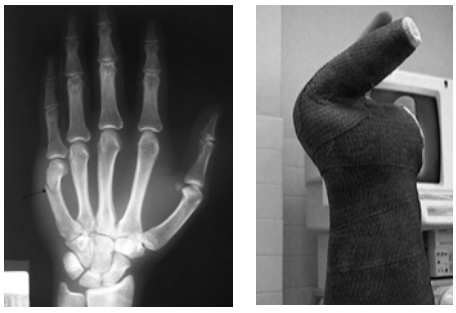
DEFINITION

- **Distal neck fx of 5th metacarpal**
  - **Volar displacement acceptable to 45 degrees for office casting +/- closed reduction**
  - **Rotation deformity**
    - **Referral**
  - **More than minimal valgus or varus displacement**
    - **Referral**
  - **PITFALLS – missing a fight bite**

Boxer's Fracture



Boxer's Fracture



Metacarpal Bones

BENNETT'S FRACTURE

- **Intra-articular fx at base of 1st metacarpal**
- **Wide displacement due to pull of FPL**
- **Fragment held in place by strong ligament**

Thumb Immobilization

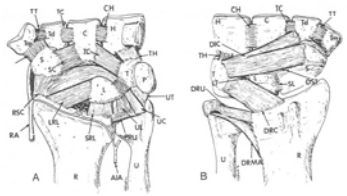
- **Thumb Spica Splinting**

Wrist & Hand Injuries

- **Scapholunate Ligament Injury**
  - Most common and most crucial ligament injury of wrist.
  - Often leads to chronic pain and/or functional instability.

PITFALL – Only looking for fractures

Scapholunate Ligament Injury



Wrist Injuries

- Scaphoid fractures
  - Most common carpal bone injury of wrist.
  - Can be radiographically occult – PITFALL - splint
  - Can lead to avascular necrosis of scaphoid if unrecognized.

Terry Thomas/David Letterman

Wrist Injuries

- Triquetral Fractures
  - Second most common fracture
  - PITFALL – not looking at Lateral film

"Wrist" Injuries

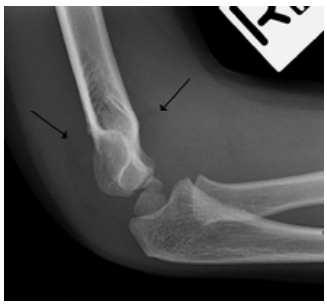
- Distal radius/ulna injury patterns
  - Colle's fractures
  - Smith's fractures (reverse Colle's)
  - PITFALL- R,M,U disruption 8%

Supracondylar Fracture

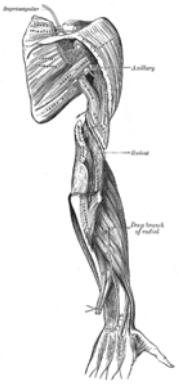
- **Mechanism: fall on flexed elbow**
- **PITFALL;**
  - **median nerve injury**
  - **Brachial artery injury**

Elbow Fractures

- **Radial Head Fracture**
  - **Sail Sign**
  - **PITFALL-**
  - **No boney abnormality, no fracture**

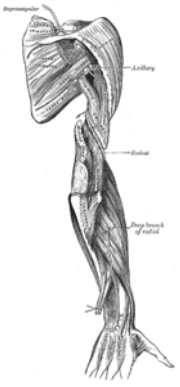


Humerus Fractures



Humerus Fractures

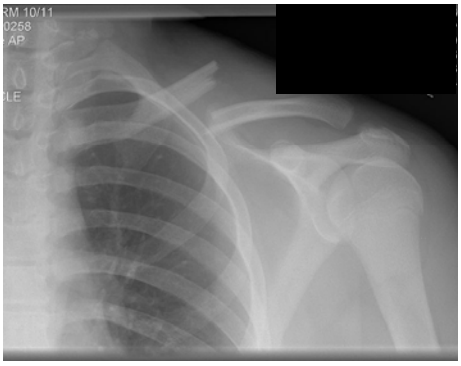
- PITFALL - Radial Nerve
- Transection
- Neuropraxia



Clavicle Fracture

- PITFALLS
  - CHECKING FOR VASCULAR INTEGRITY
  - ASSOCIATED INJURIES
  - SKIN TENTING

Clavicle Fracture



Shoulder Dislocations

Shoulder Dislocations

- Anterior
  - Most common
    - Scaphoid deformity
    - Flexed and adducted
- Posterior
  - Seizures
  - PITFALL – not controlling seizures
- Inferior/Thoracic

Knee Injuries

Hip Fractures

- PITFALLS
  - Recognizing Occult fractures
  - Addressing high morbidity

Knee Injuries

- Patella Alta - PITFALL
- Patellar fractures – PITFALL – check extensor mechanism

Common Knee Fractures

Ankle Fractures

- Bi and Tri malleolar fractures
- Mortis disruption

Mechanism of Ankle Injuury

- Inversion + Plantarflexion= 80% sprains
  - Most commonly involve the Anterior Talofibular Ligament.
- Inversion or Eversion alone
- Landing on unsteady object
- Change of Direction
  - Deceleration associated
- Manual Twisting
  - Wrestling injury

Ankle Fractures

- PITFALL
  - Examining the joint above and below

Proximal 5th Metatarsal Palpation

- Test of 5th Metatarsal Avulsion
  - Occurs most commonly with inversion
  - Peroneus Brevis pulls styloid off of 5th Metatarsal
  - PITFALL - Palpate at styloid for pain.
    - If positive for pain should X-ray.

Common Fractures in Orthopedics

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Ohio State University Medical Center

5th Metatarsal Fractures

- Jones versus pseudo Jones
  - PITFALL – nonreferal of Jones

Adult Common Fractures Objectives

1. Recommend an approach to the evaluation of patients who present with a fracture
2. Identify operative and non-operative injuries commonly seen in orthopedics
3. Describe basic surgical treatment options for fractures
4. Understand goals of surgery and what your patients can expect during post operative period

Evaluation

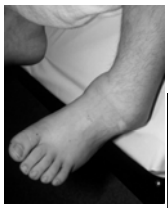
- Patients age
- History
  - ***Time of injury***
  - ***Mechanism of injury***
  - ***"What hurts"***
- Medical History
- Surgical History
- Social Hx ***(occupation)***
- Medications ***(anticoagulation)***
- Smoking/Alcohol history

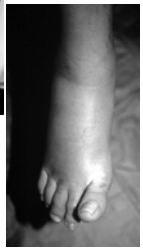
Clinical Evaluation

- Need to closely exam the soft tissues around the fracture
- Look for openings in the skin – which may indicate an "open" fracture
- Abrasions? Amount of swelling? Presence of fracture blisters?

Physical Examination

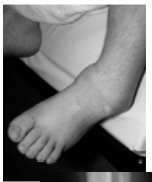
- Look for deformity
- Palpate areas of tenderness
- Examine the joint above and below
- Detailed neurologic and vascular examination





Clinical Evaluation

- Soft tissue care
  - Primary goal is to halt continuing trauma to the tissues
  - Treatment of fractures first begins with "reducing" the fracture or dislocation
  - Immobilizing the fracture with a splint or external fixation



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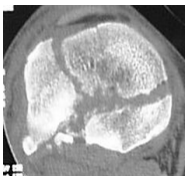
Imaging Studies

- Some instances plain x-rays do not define the fracture well
  - Joint injuries with multiple fragment => CT scan
  - Occult fractures

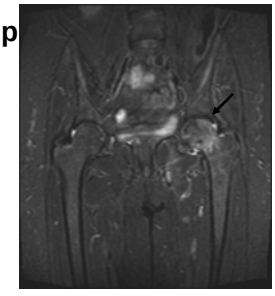


Imaging studies

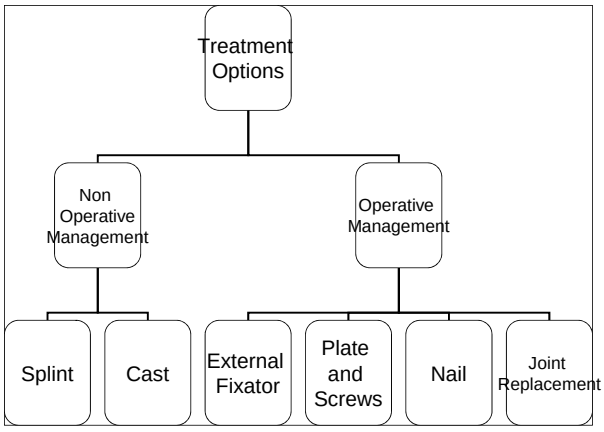
- Radiographic assessment of fractures
- Begins with plain x-rays
  - 2 views at least
  - AP (anteroposterior) and lateral views
  - Joints above and below as some of the energy can be absorbed at a site away from the injury

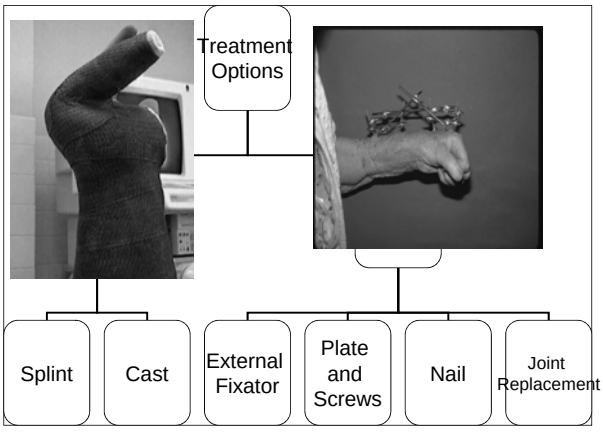
Special Studies

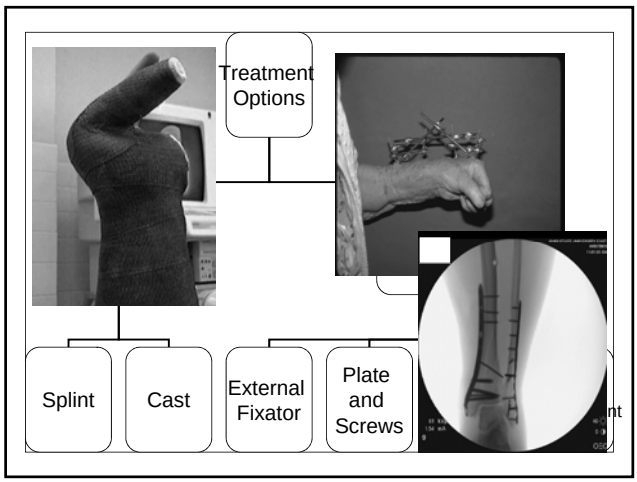
- Elderly patients with hip pain => MRI can diagnose an occult hip fracture
- Occult Fractures
  - Bone Scan
    - Sensitivity 100% @ 72hrs
  - MRI
    - Sensitive in first 24 hrs

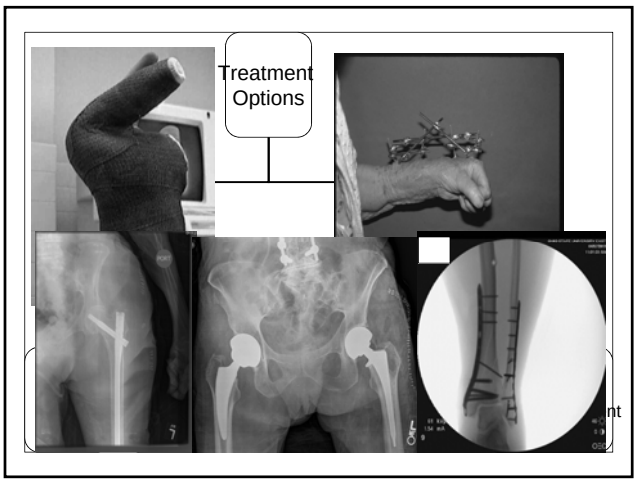


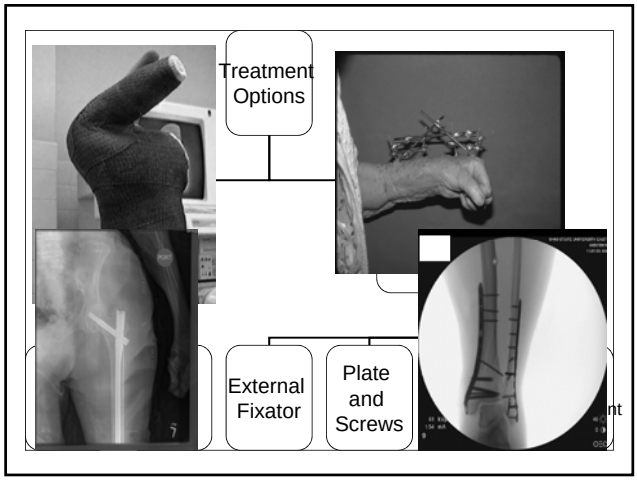
Now that we have a diagnosis, where do we go from here?











Fractures that require surgical intervention

- **“Open” fractures**
- **Irreducible fractures or dislocations**
- **Displaced intra-articular fractures**

Fracture Healing

- In general all adult fractures take 6-8 weeks to heal with or without surgical intervention
- Some fractures have longer healing times
  - Open fractures
  - Fractures in patients with diabetes
  - Intra-articular (joint) fractures
  - Fractures in bones with poor blood supply (scaphoid, talus, tibia)

Goals of Surgery

- Decrease pain
- Fix fracture/Replace with prosthesis
- Early return to function
- Early mobility – PT/Strengthening/ROM
- Return to work
- Return to life

Primary Goals

- Immobilize (let soft tissues relax)
- Pain control
- Ice and elevation
- Upper extremity – sling
- Lower extremity – crutches/walker
- Urgent orthopedic follow up

Examples of Common Fractures

Metacarpal Fractures

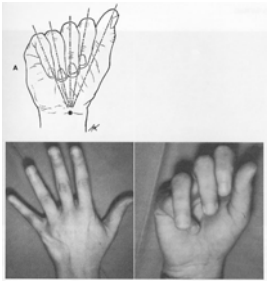
- ~3% of all fractures
- >50% work related
- Less frequent, MVC, recreation, household injuries
- Border digits most common

Metacarpal neck fractures

- Extra-articular fxs
  - Some angulation, shortening accepted (more in little/ring, less w/ index/long fingers), but rotation need to be corrected
- "Boxer's fracture"
  - ulnar gutter splint 10-14 days

Evaluation

- Physical exam
  - Range of motion
  - Rotational deformity
  - Associated soft-tissue injury
  - Neurovascular examination



Distal Radius Fractures

- Common sites of injuries
- Most common fx of the UE
- 8-17% all bony injuries

Classification
Fracture Pattern

Classification
Fracture Pattern

Stable

Amenable to closed reduction and casting treatment

Unstable

Requires definitive fixation to achieve/maintain Radiographic parameters

Classification
Fracture Pattern

Stable

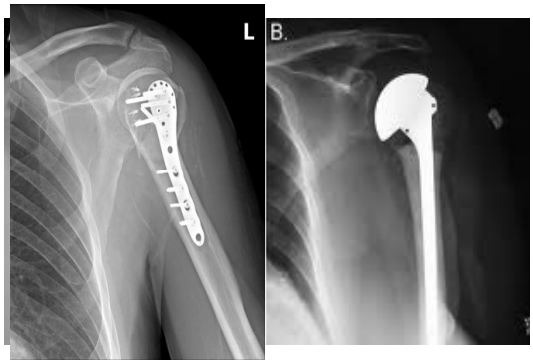
Amenable to closed reduction and casting treatment

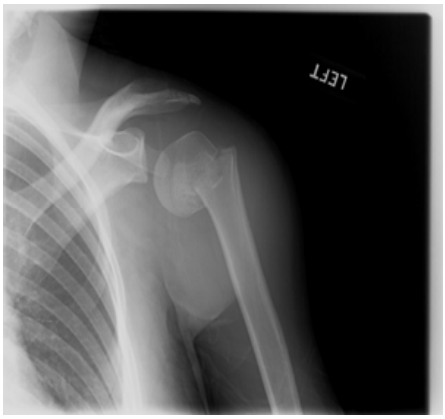
Common Fractures

- **Clavicle fractures**
  - **Vast majority heal with simple immobilization with sling for comfort**
  - **Begin early range of motion (1-2 weeks)**
  - **6-8 weeks back to full activities**

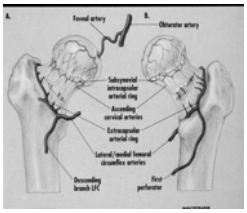
Proximal humerus fractures

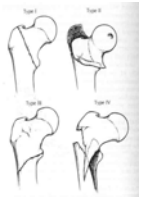
- 4-5% of all fractures
- Most fxs (80-85%) min displaced
- Bimodal distribution
  - Young high energy injury
  - Older pt, low energy injury, osteoporotic bone





Common Fractures about the hip





Displaced or Non-displaced

Femoral neck fracture

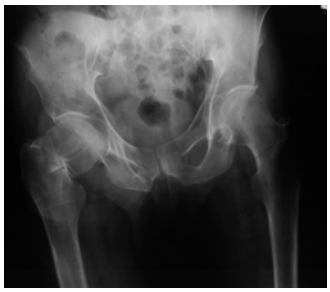
Intertrochanteric

Hip fracture

Incidence

- 250,000 Hip Fractures/year
- Double by 2040 to 500,000

Femoral neck fractures

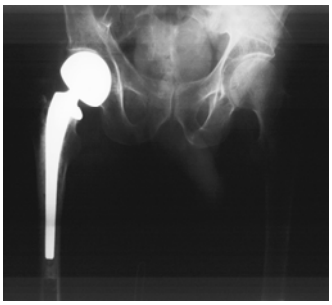


Etiology

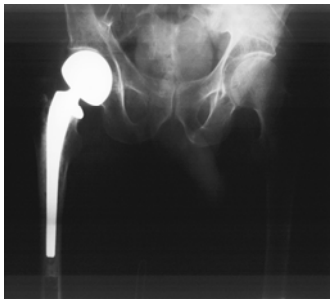
- Osteoporosis
- Low energy fall
- 90% >65y/o
- Peak @ 80y/o
- F>M

- High energy fxs
  - More rare

Femoral neck fractures



Femoral neck fractures




Intertrochateric Hip Fractures


Intertrochateric Hip Fractures

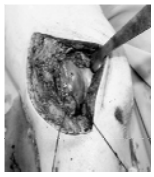
Why fix?

- Early mobilization
  - WBAT POD 1
  - Prevents prolonged bedrest
  - Decreased bed sores
  - Decreased pneumonia
  - Decreased pain
- Function
  - 40% Pre-Injury Ambulatory Status

Osteoporos Int. 2000;11(12):1018-23
J Gerontol A Biol Sci Med Sci. 1999 Dec;54(12):M635-40

Fractures around the knee

- Supracondylar / intracondylar distal femur fractures
- Tibial plateau fractures
- "Joint" or "intra-articular" fractures
  - Recommend surgical ORIF for majority of fractures due to joint involvement



Fractures around the knee

- Longer period of NWB (typically 3 months) postoperatively due to joint fixation
- Early range of motion to prevent knee contractures

Fractures around the knee

Foot and Ankle Fractures

- Foot and ankle trauma is common
- 25% of all traumatic injuries
- Significant time loss from work
  - Foot required for walking

Nonoperative Treatment

- Indicated for some isolated lateral malleolus fractures
  - WBAT in fracture boot
  - Early ROM exercises / PT
  - Takes ~6-8 weeks to heal

Metatarsal Fractures

- Treatment usually nonoperative
- Symptomatic:
  - Hard shoe
  - Walking cast
  - Elastic bandage

Ankle fractures

- Surgical intervention indicated for
  - Medial malleolus fractures
  - Bimalleolar and trimalleolar fractures
- Patients instructed to be non-weight bearing for 8 weeks after surgery (longer if associated ligmentous injury)
- 3-6 month recovery time

Lisfranc Injuries

- Up to 40% overlooked on initial radiographs
- High index of suspicion
- Xrays may show minimal displacement vs complete disruption

Take Home Points

- **Begin with thorough clinical evaluation**
- **Obtain appropriate radiographs**
- **Splint/Immobilize**
- **Patients should be prepared for a “long” recovery time**
- **Surgery provides early ROM, predictive healing, better functional outcome**