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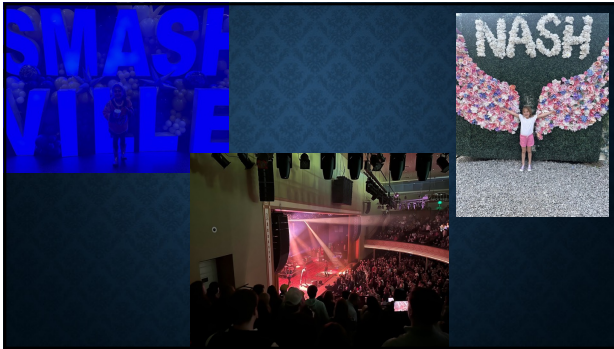
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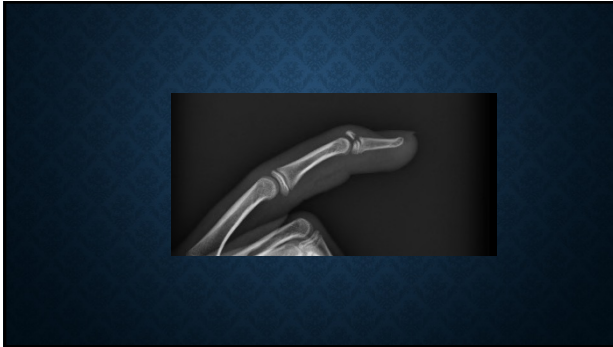
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### DISTAL PHALANX FRACTURES

- Mallet Finger
  - Usually caused by a direct blow to the finger
    - Less commonly caused by a dorsal laceration
  - Can be just avulsion of the tendon or a fracture with an avulsion
    - Radiographs are a must especially a good lateral view
      - Key to assessing for distal phalanx volar subluxation
  - Treatment Options
    - Non-Op
      - DIP Extension Splinting for 6-8 weeks Full Time
    - Operative
      - Usually Closed Reduction with Pinning across the DIP Joint
      - Indications
        - Volar Subluxation of the Distal Phalanx
          - $\geq 50\%$  or more articular involvement, 2mm gap

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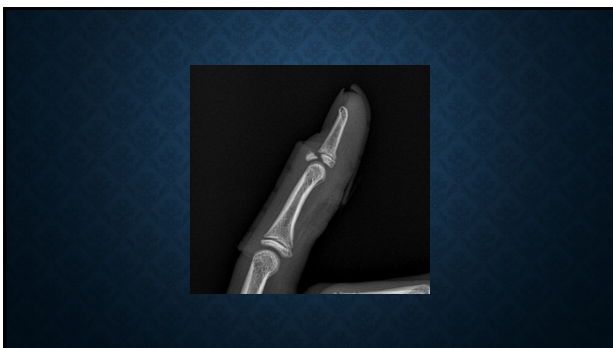
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### CUSTOM SPLINTS FOR MALLET FINGER



**Figure of 8 Splint**  
 Pro: Quickest and Least Material  
 Con: Least Stable



**Stax Style**  
 Pro: More Stable, Off the shelf options as well, *My preference*  
 Con: More time and material to make



**Sugar Tong**  
 Pro: Most stable  
 Con: May trap moisture and not ideal if there is a laceration

Always try to leave the PIP Joint Free!

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### FOLLOW UP PROTOCOL

- For non operative patients, always see back in 1 week
  - Splint compliance can be poor and its always good to go over again
    - Splints must be worn full time!
  - *If they have a fracture you always want to get repeat xrays*
    - Splints in hyperextension can cause volar subluxation of the distal phalanx
- Heal time is usually around 6-8 weeks
  - Soft tissue only takes longer to heal
  - Smaller fingers take longer to heal
- Results are usually functional fingers with a -10 degree lag but functionally they are fine
- Can be treated up to 6 weeks after injury with good results

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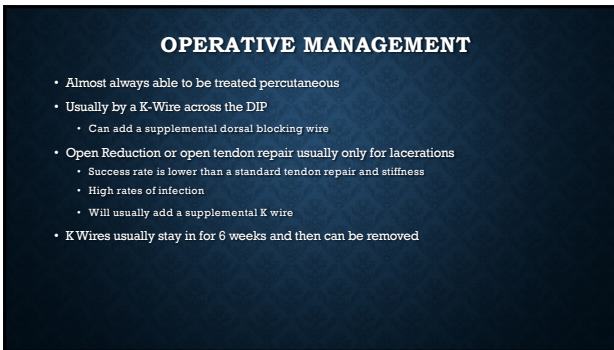
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# QUESTIONS ABOUT Mallet Fingers?

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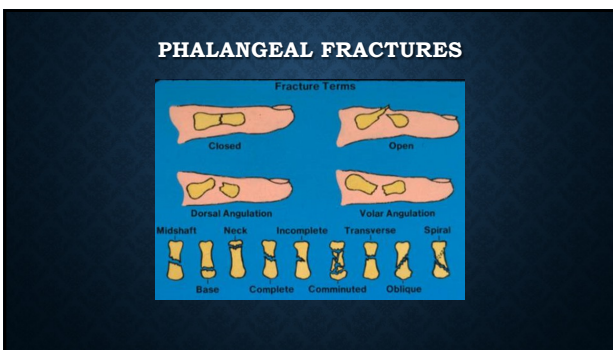
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### PHALANGEAL FRACTURES

- Most are extra-articular and can be treated non operatively
- Buddy straps and custom splints are usually the best options
  - *Be careful immobilizing joints!*
- Surgical Indications
  - **MALROTATION**
  - Excessive Angulation
  - Most open Proximal and Middle Phalanx Fractures
    - Recent Data does suggest that open finger fractures do not have to washed out in the operating room
  - Intraarticular incongruity
    - Especially in the FIP Joint

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### MALROTATION



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### MALROTATION



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**MALROTATION**

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Use both Xray and Physical Exam to check

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Check with fingers extended and flexed

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If patients have trouble moving may want to bring them back in a few days

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**OPERATIVE FIXATION**

- Minimize dissection if possible with some exceptions
- Options include:
  1. K Wires & Interosseous Wires – Pros: Fast, easy and cheap; Cons- Not rigid, can be potential source of infection
  2. Plates – Pros: Strong and rigid fixation, usually allows for early motion; Cons – May require extensive dissection and soft tissue stripping, can be prominent and need removal
  3. Lag Screws – Pros: Allows early motion with stable fixation and less dissection; Cons – Not for every fracture
  4. Ex Fix – Pros: Good bail out option for difficult fractures with bone loss; Cons – Bulky, can limit motion and infection

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**THERAPY FOR PHALANGEAL FRACTURES**

- Early motion as tolerated!
- Good communication with patient and surgeon on goals
- Intrinsic Plus position and Dorsal Block Splinting is the gold standard
  - Intrinsic Plus Position
    - Wrist - 10 degrees less than full extension
    - MP - Flexed at 90-95 degrees
    - IP - Fully extended
    - Thumb - In a fist position
- Immobilization causes stiffness which can lead to loss of motion
- Goals are to minimize inflammation while helping tissues glide on all surfaces of bone
  - Tendons are key
  - PIP joint is usually the most problematic
- End motion goals are enough flexion to get the finger out of the way and not get caught but be able to extend to shake hands or get into pockets

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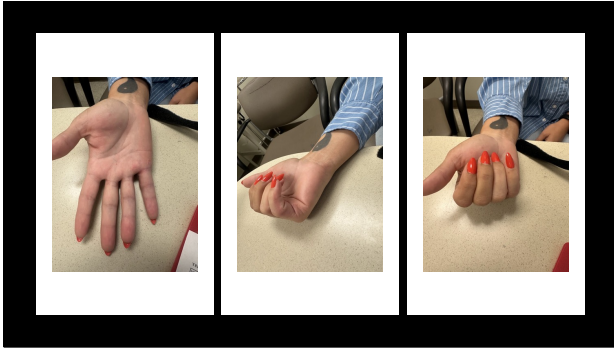
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### METACARPAL FRACTURES

- Separated into 3 groups
  - Head (least common), Shaft (most common), Base
- Operative indications for all revolve around rotation and location
  - **Finger malrotation**
  - **Are the CMC and MP joints located?**
    - CT scan may be necessary in the CMC joint area as these can be difficult to image with xrays
- Open and multiple fractures should be considered especially in high energy trauma
  - Frequently involved in crush mechanism
- Recently with development of metacarpal nails relative indications for surgery have increased especially in patients who require early mobilization
  - Athletes, Manual laborers

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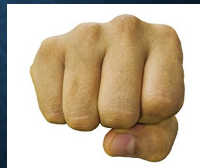
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### NONOPERATIVE MANAGEMENT

- Early Mobilization and relatively short course of splinting
- Most shaft fractures are inherently stable due to the intermetacarpal ligaments
- Splint for 3-6 weeks with IP joints free
  - Encourage motion
- Ulnar Digits tolerate more angulation
- Patient selection is key!
- Extensor Lag and dorsal prominence are common
- **Usually Check at 1 week!**




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### THERAPY FOR METACARPAL FRACTURES

- Minimal therapy usually required with splinting and early motion
- IP joints usually free and can do taping to help with rotation
  - Be careful with this though sometimes especially in the 5<sup>th</sup> it can malrotate!




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### OPERATIVE MANAGEMENT

- K Wires especially for base fractures
  - May need to pin across CMC joint
- Lag screws
- Plates – fractures that are not amenable to a nail or lag screws
- Metacarpal Nails
  - Have replaced headless compression screws
  - Little or no compression which aids in reduction
  - May allow for early ROM and weightbearing
  - Pitfalls
    - 4<sup>th</sup> Metacarpal is the smallest
    - Young patients either skeletally immature or just mature



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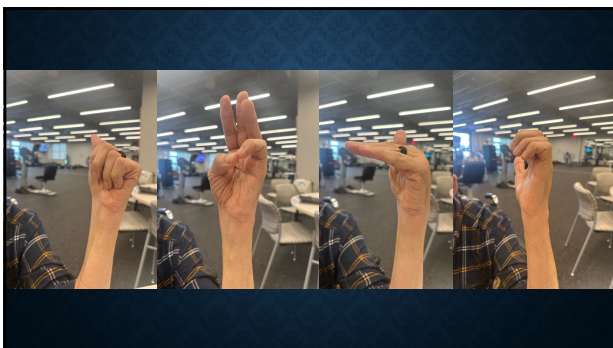
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**QUESTIONS  
ABOUT  
METACARPAL  
FRACTURES?**

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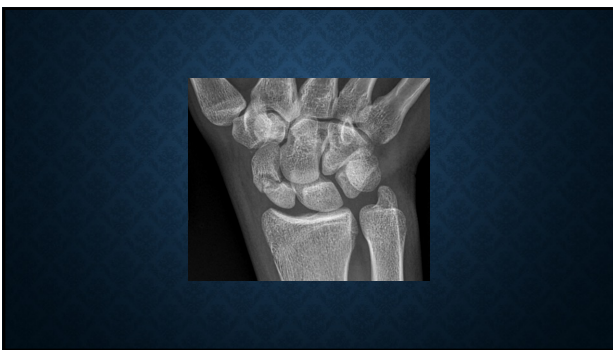
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**SCAPHOID FRACTURES**

- Occur mainly in males from 15-40
- Fall on outstretched hand
- Early Diagnosis is key and want to be aggressive
  1. Physical Exam
    - Pain over the scaphoid both volar and dorsal
    - Swelling
  2. Xrays
    - Make sure to get a scaphoid view
    - Fractures frequently do not show up on 1 or 2 images on the wrist series
  3. Advanced Imaging
    - MRI - most sensitive and specific, sometimes not perfect at picking up fracture characteristics
      - My choice in subacute, proximal pole or chronic fractures
      - T1 imaging helps with vascularity of proximal pole
      - Image quality is key
    - CT - my choice in acute fractures, also best to evaluate healing

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**SCAPHOID FRACTURES**

**• If diagnosis is unclear, immobilize and repeat xrays in 2 weeks or order advanced imaging**

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**NONOPERATIVE MANAGEMENT**

- Almost all of my patients get a cast
- No difference has been shown between long arm versus short arm versus thumb spica cast
- Personally I use a short arm cast in all scaphoid fractures except distal pole fractures which I do a thumb spica
- Usually no therapy is required

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### OPERATIVE TREATMENT

- Displaced Fractures
- Unstable Fractures – transverse fracture line
- Proximal Pole Fractures
- Athletes
  - Some data to suggest quicker return to sport

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### SURGICAL APPROACH

- 2 main approaches Dorsal and Volar
  - Different surgeons have different opinions
  - Mainly agree on distal fractures usually require a volar approach, proximal fractures require a volar approach
  - Most fractures could be amenable to either
- Personally dorsal allows me easier access to bone graft and a more reliable screw placement so I prefer dorsal
- Volar is necessary when there is a humpback deformity
- Bone Grafting – No consensus
- Post Op patients should be immobilized for 6-12 weeks
- Post Op CT scan is necessary in delayed treatment or when radiographs do not show healing
  - Xrays are not good at picking up healing
  - Usually at 8-12 weeks



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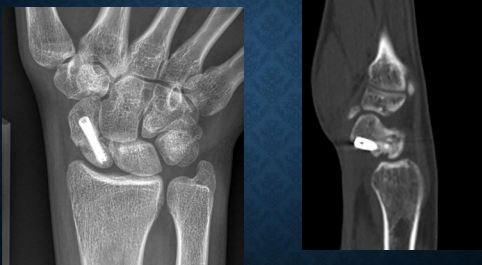
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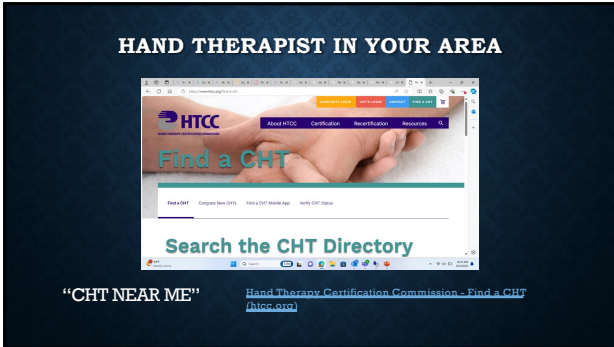
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