2024
Work Related Injuries Workshop

SHAKE IT UP:
Hand, Wrist, & Forearm Review & Updates

Chairperson:

Hervey L. Kimball, MD, MS

Orthopedic Hand & Upper Extremity Surgeon

Boston Sports & Shoulder Center &

New England Baptist Hospital

Tuesday, March 26th, 2024

10:50-11:30am

Our Experts

HORST, MD

STEIN, MD

ANASTOS, JD

MATTIE, DPT

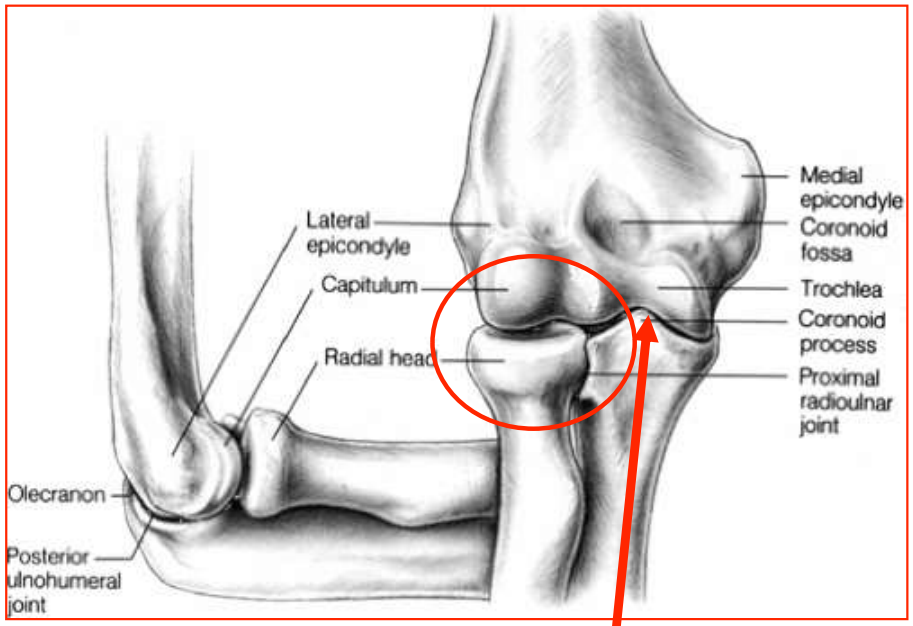
PIERCE, JD

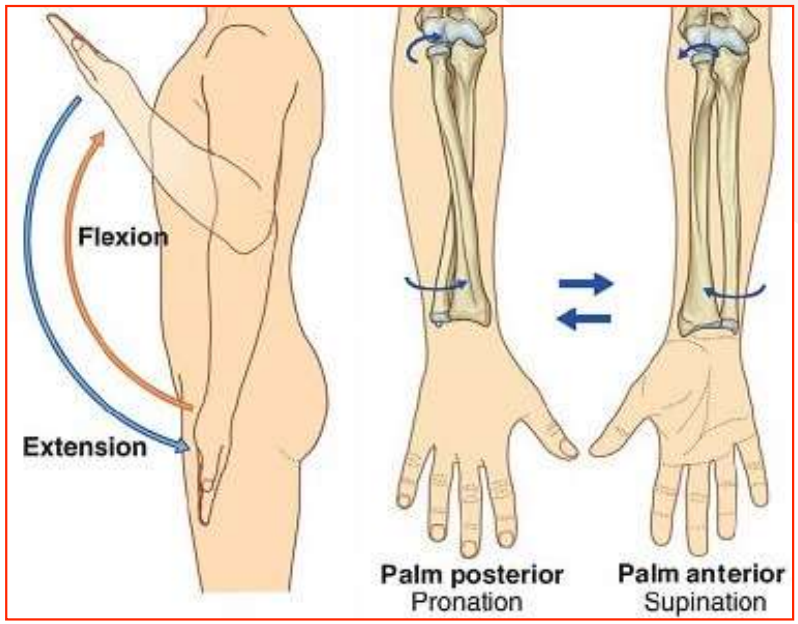
2024
Work Related Injuries
Workshop

Treatment of Traumatic Arthritis of the Elbow

Andrew B. Stein, MD
Boston Medical Center

Elbow Anatomy





3 Separate Joints:

-Ulno-humeral joint (UH): **Hinge** joint that provides flexion/extension

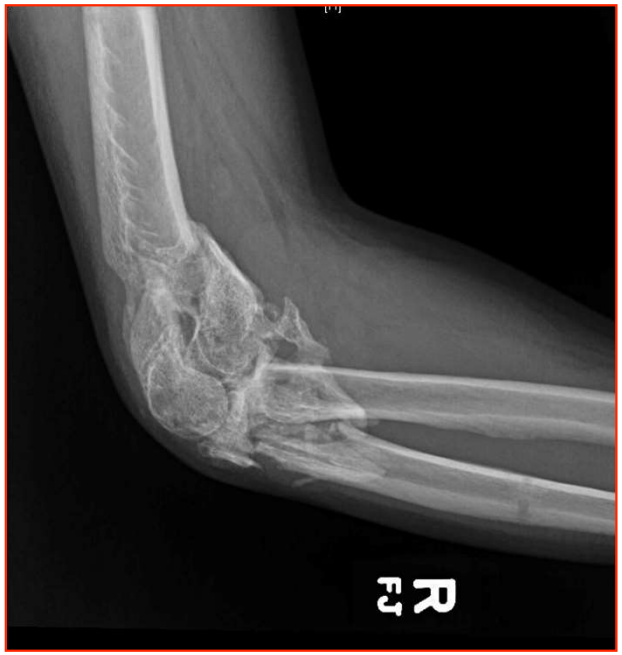
-Radio-capitellar joint (RC)

-Proximal radioulnar joint (PRUJ) } RC & PRUJ together provides **forearm rotation**

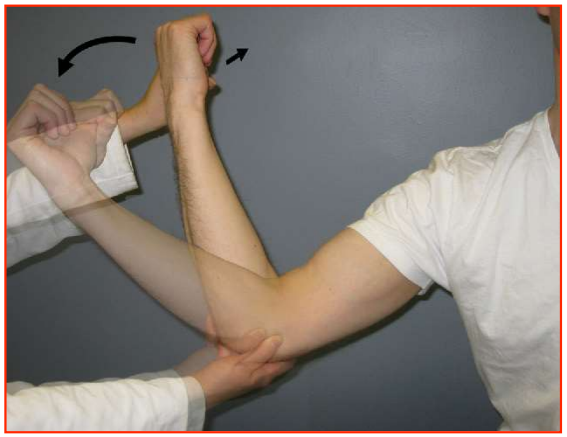
Elbow Arthritis

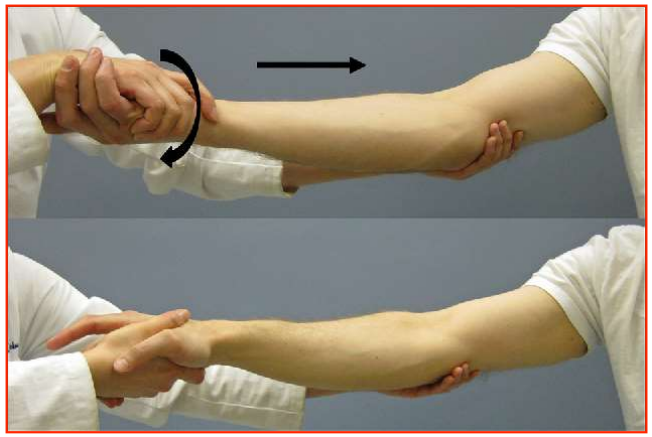
- Relatively uncommon compared to hip & knee
  - Primary OA
  - Inflammatory
  - **Traumatic**

- *Not* equivalent entities

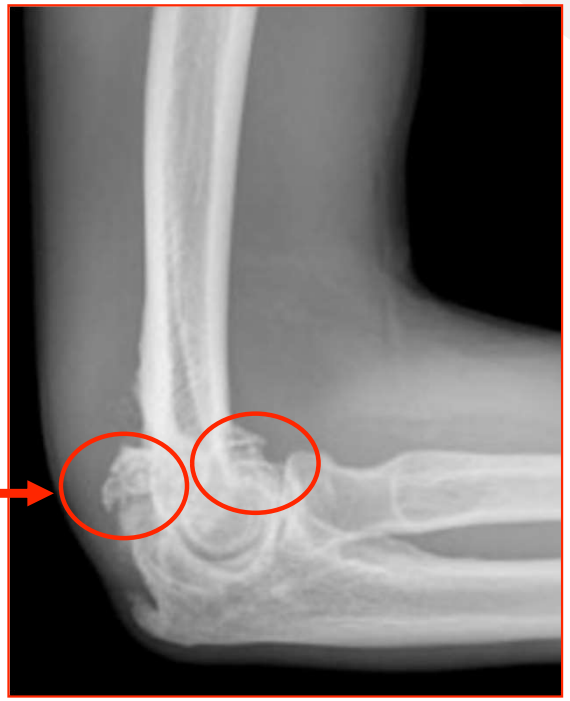


Physical Examination



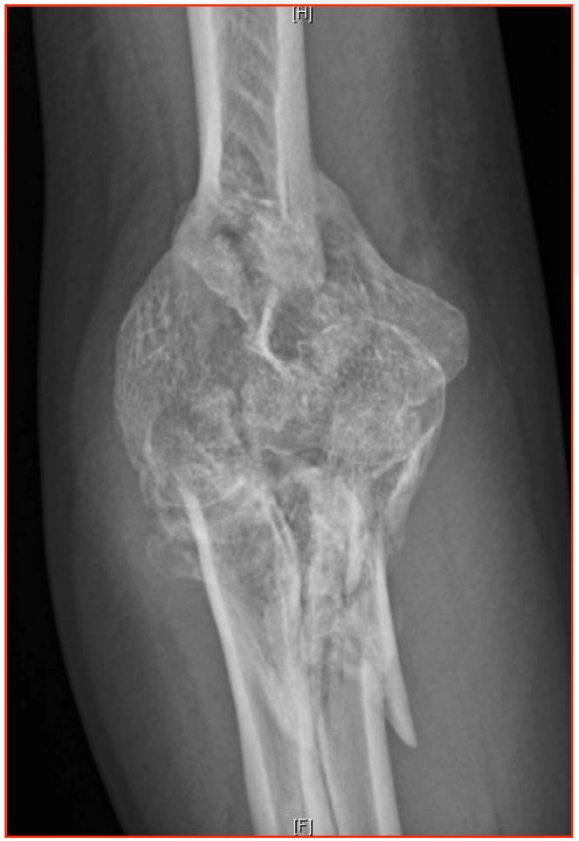


- **Range of Motion**
  - Functional arc 100° (F/E and P/S)
- **Pain**
  - Only at terminal F/E (primary OA)
  - Full arc (Traumatic, Inflammatory)
- **Instability**



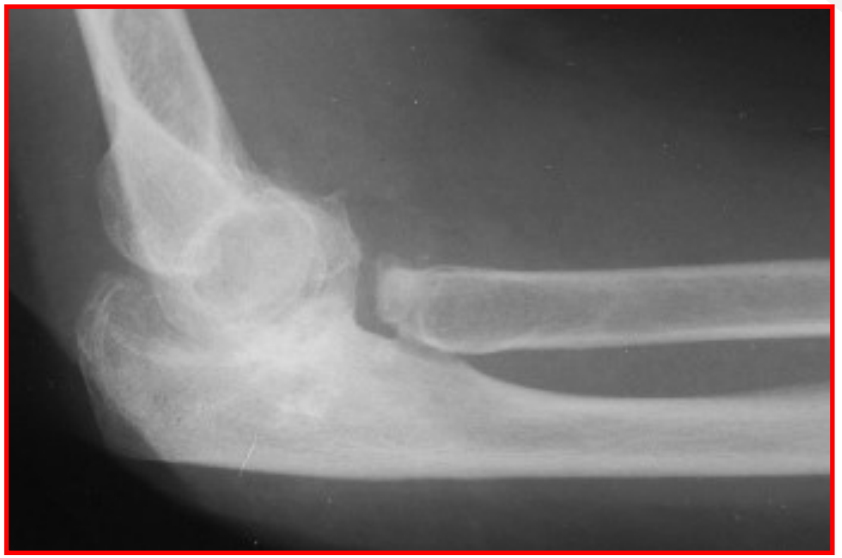
Traumatic OA Elbow

- Involvement of entire joint
  - Pain through entire arc of motion
- May be associated with instability
- Often isolated and affecting high demand pts (unlike inflammatory arthritis)
- Conservative measures are limited (NSAIDs, bracing)



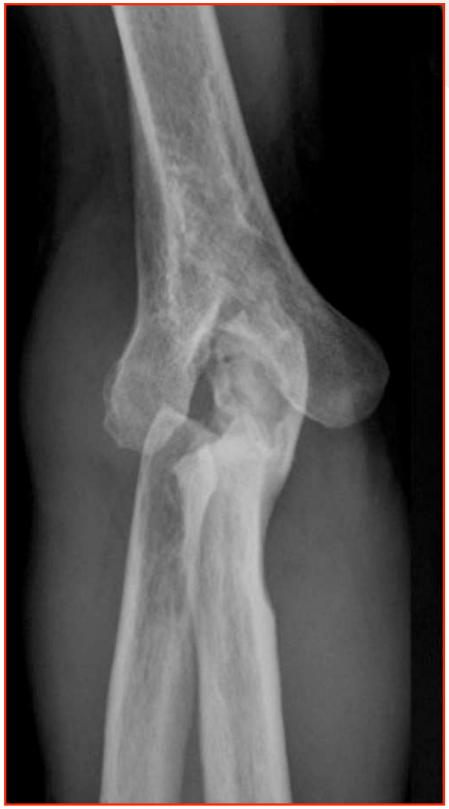
Surgical Options Traumatic OA

- Resection Arthroplasty
- Arthrodesis
- Osteochondral Allograft
- Fascial Arthroplasty
- Prosthetic TEA



Resection Arthroplasty

- Patients benefit from pain relief
- Poor functional outcomes due to instability
- Considered last resort



Long-Term Outcome of Resection Arthroplasty for the Failed Total Elbow Arthroplasty

Zarkadas, Peter C. MD, FRCSC[1]; Cass, Benjamin MBBS[1]; Throckmorton, Thomas MD[1]; Adams, Robert PA[1]; Sanchez-Sotelo, Joaquin MD, PhD[1]; Morrey, Bernard F. MD[1]

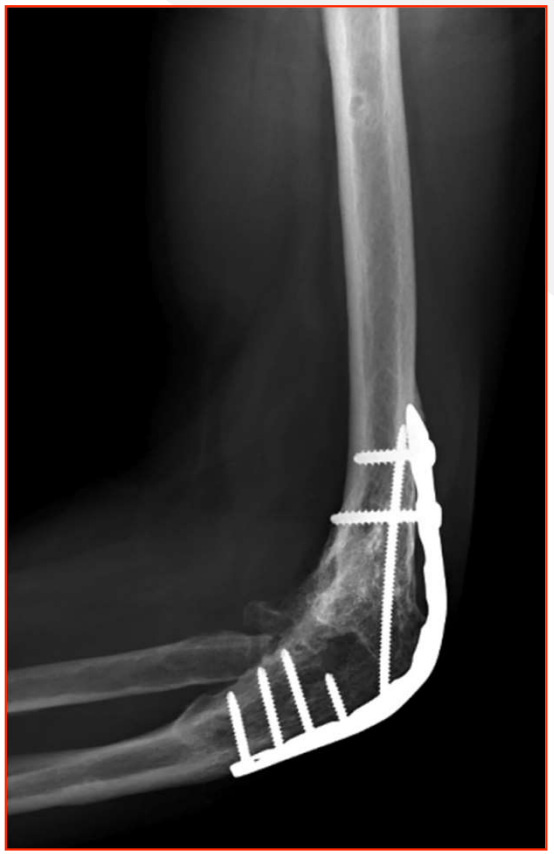
Author Information

The Journal of Bone & Joint Surgery 92(15):p 2576-2582, November 3, 2010. | **DOI:** 10.2106/JBJS.I.00577

Arthrodesis

- Limited literature
- High complication rate
    - Need for re-operation high
    - Rate of fusion low
    - Persistent infection
- No optimum position for function
- Inability to position hand in space is poorly tolerated (not compensated by shoulder motion)

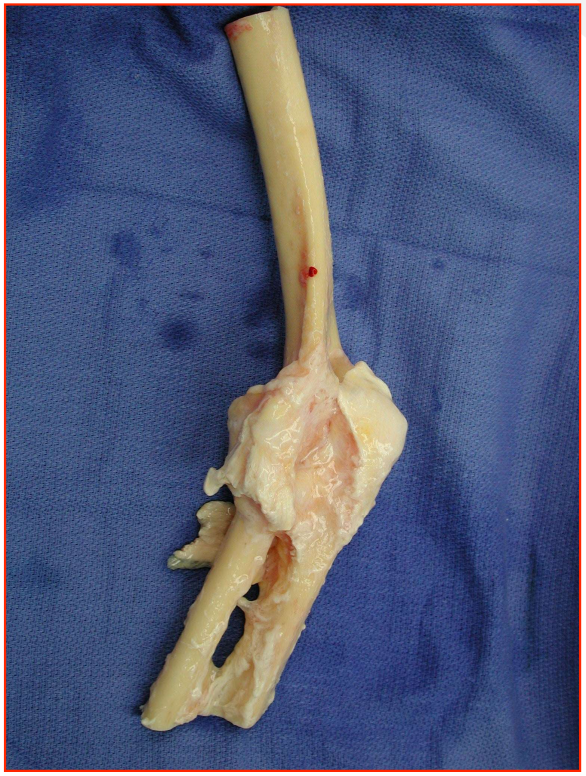
-Randall et al. *JSES* 2014
-Koller et al. *JSES* 2008



Osteochondral Allograft

- Reserved for significant bone loss in pt. not a candidate for arthroplasty
- Technically challenging
- High complication rate
  - infection, non-union
- Results deteriorate over time (Charcot-like)

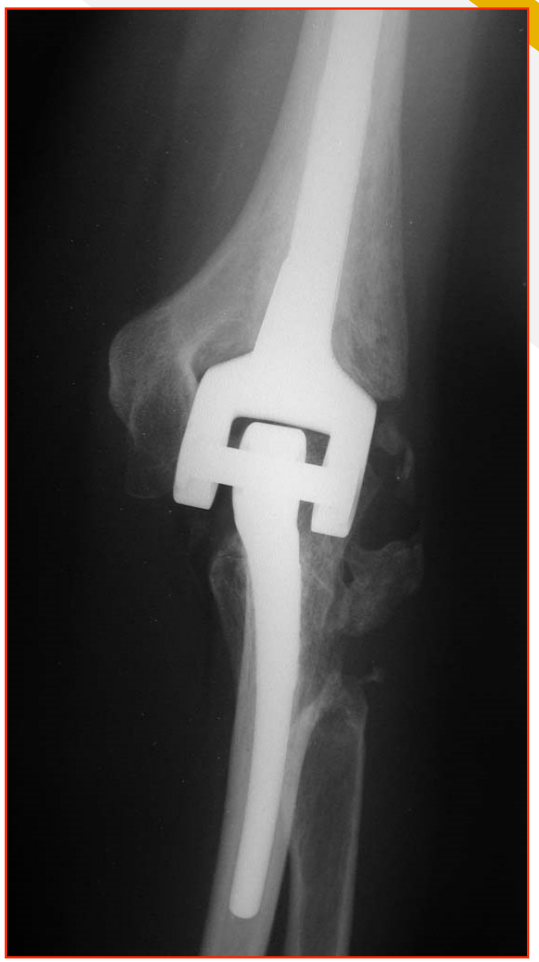
-Urbaniak *CORR* 1997 (complics. 16/23)
-Itamura *JOS* 2010 (complics. 4/8)



Prosthetic TEA

- Predictably good early results
- Permanent lifting restrictions (<5kg)
- High complication and revision rates in pts<50 yrs (42%)
- ?Longevity & potential need for revision limits applicability in young active patients

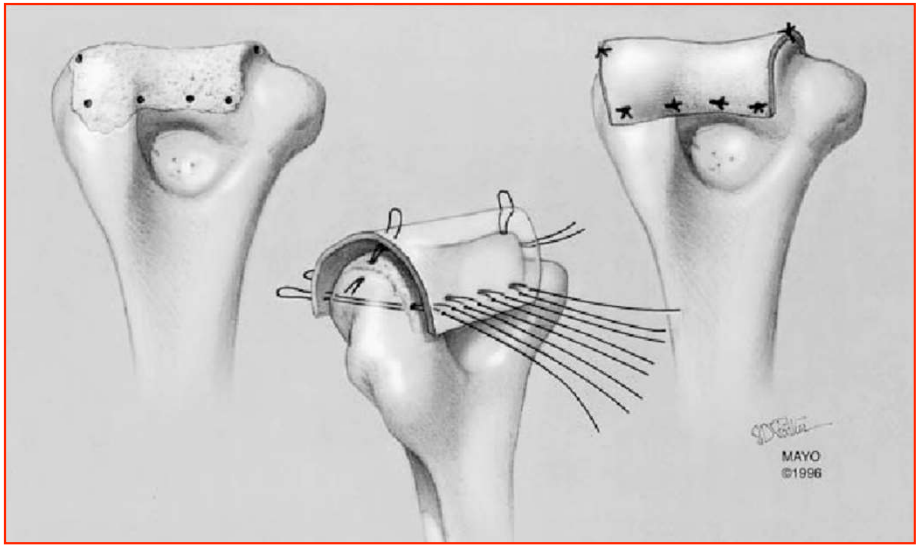
-Siala et al. *JSES* 2020
-Schoch et al. *JHS* 2017



Fascial Arthroplasty

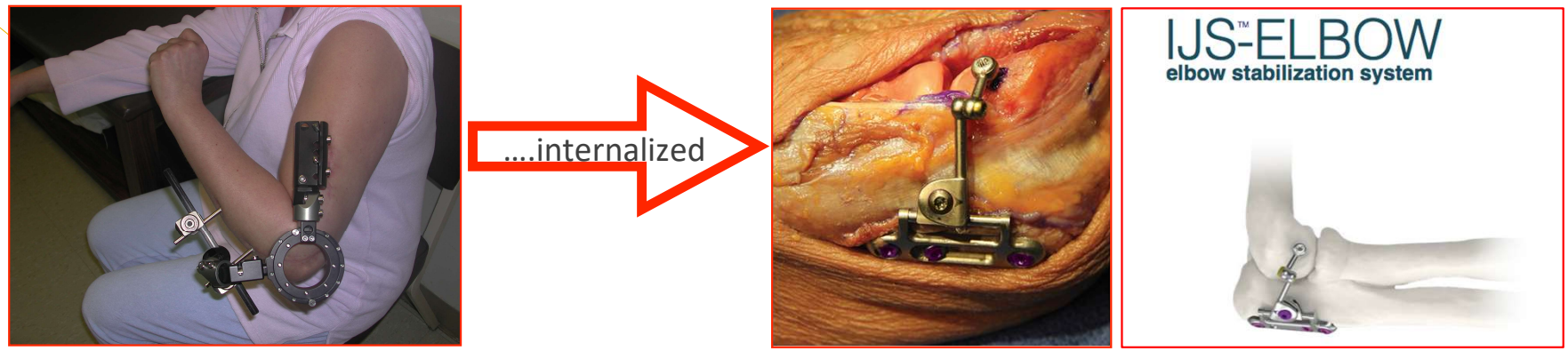
- Re-surfacing of ulno-humeral joint
  - Dermis, fascia, tendon
- Consider in “young” high demand patients with adequate bone stock, joint stability

- **Advantages**
  - Potentially long-lasting
  - Allows active lifestyle
- **Disadvantages**
  - Technically challenging

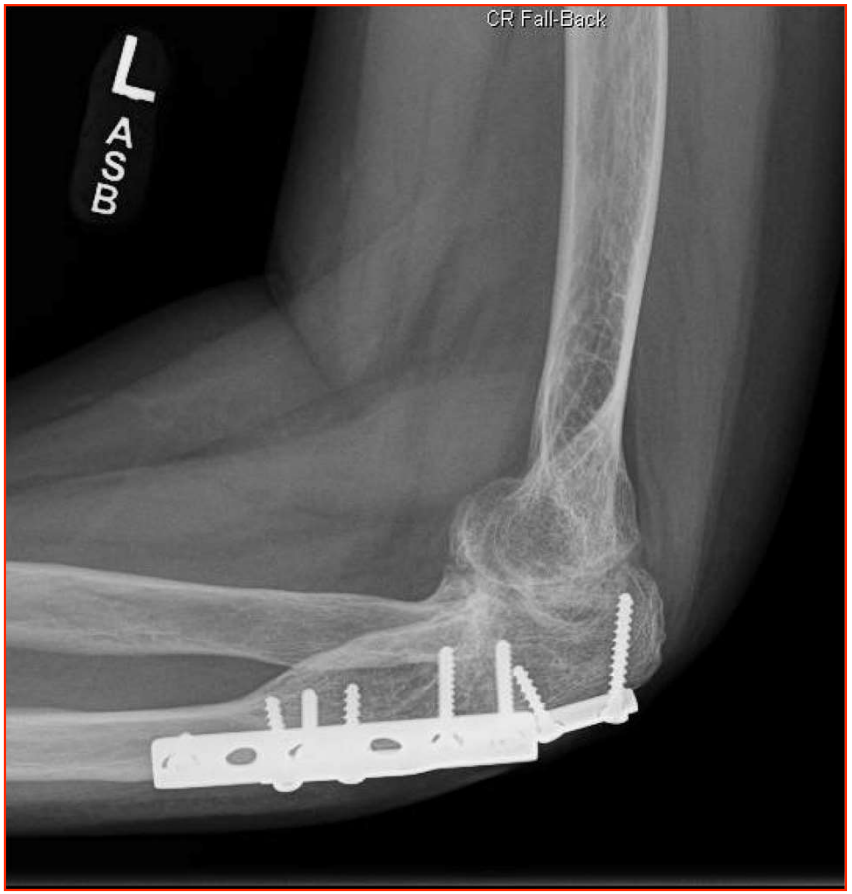


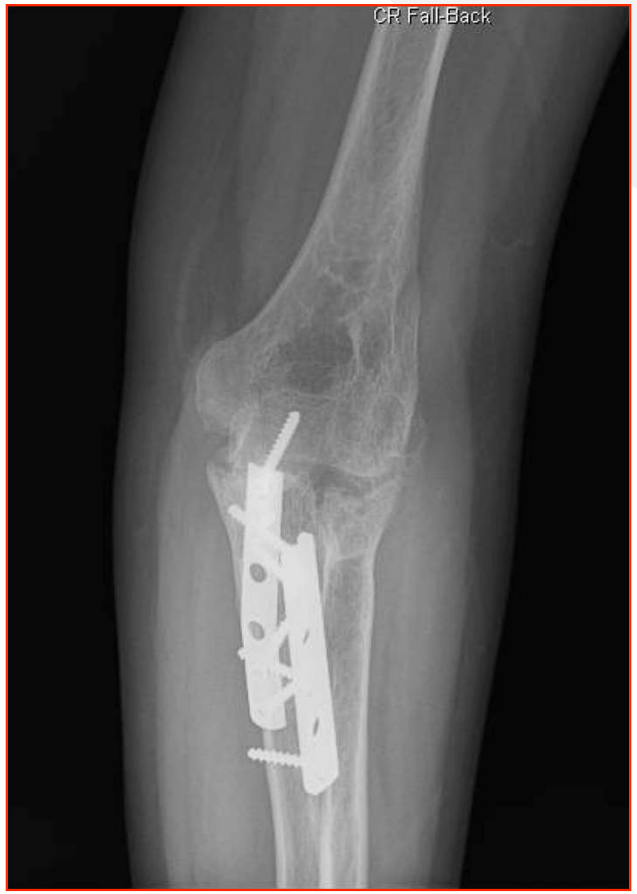
Fascial Arthroplasty

- Generally deciding between **TEA or FA**
  - **Predictable result w/activity limitations (TEA) vs. less than perfect result with no activity restrictions (FA)**
- Recent improvements had made FA more appealing
  - Ex Fix alternative (IJS) - allows prolonged support
  - More durable interposition material (Dermal Allograft)
  - Better surgical technique (Ligament preservation/reconstruction)



31F 2 yrs post-op





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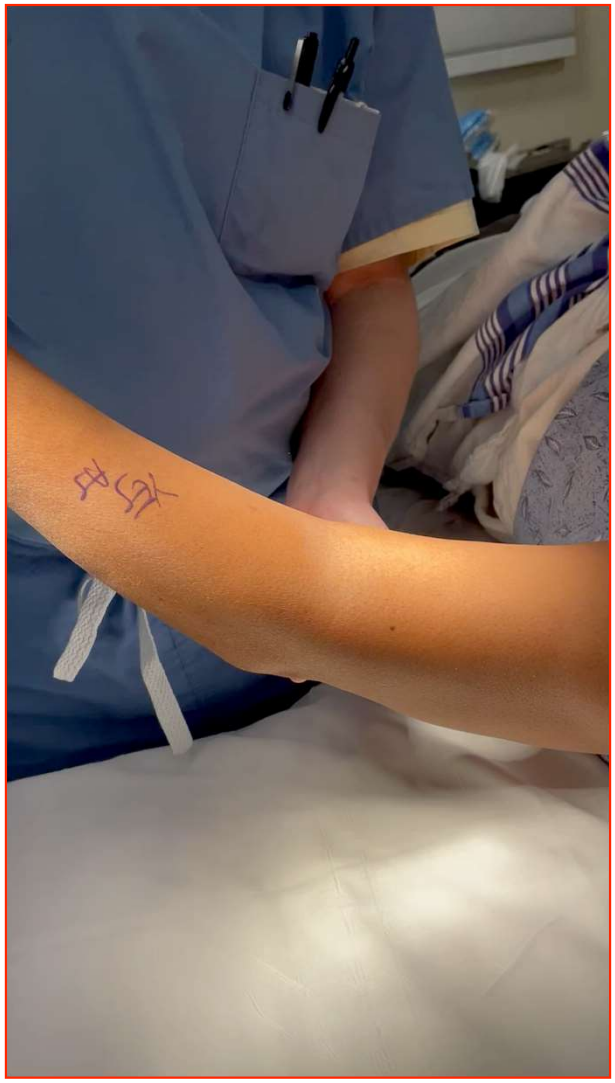
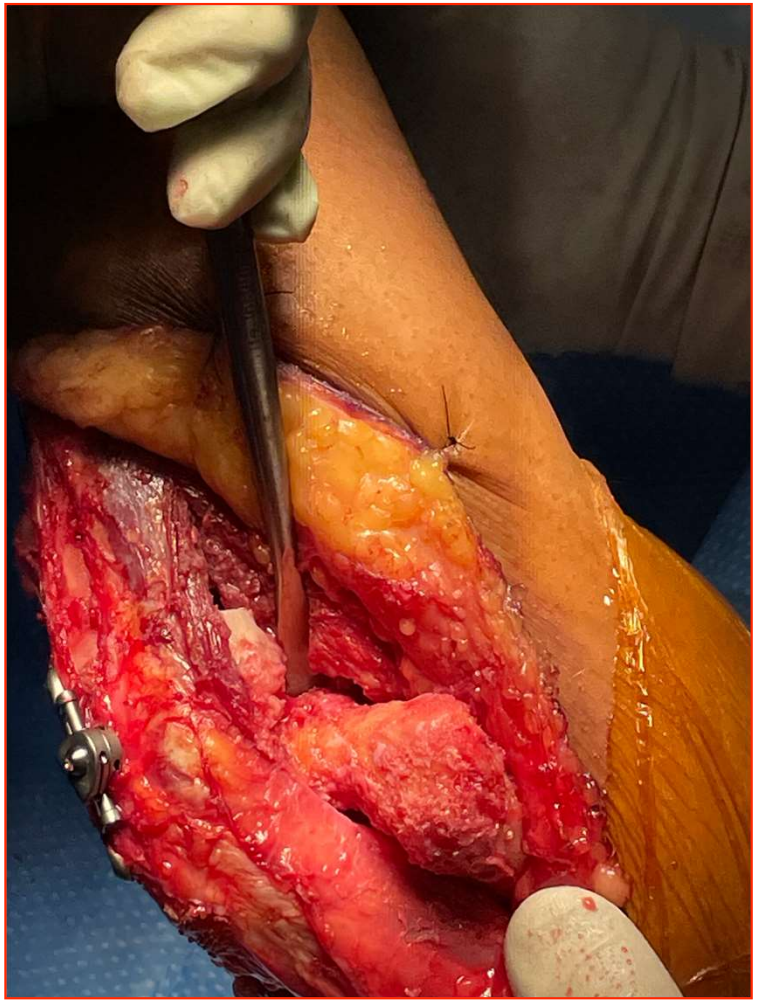
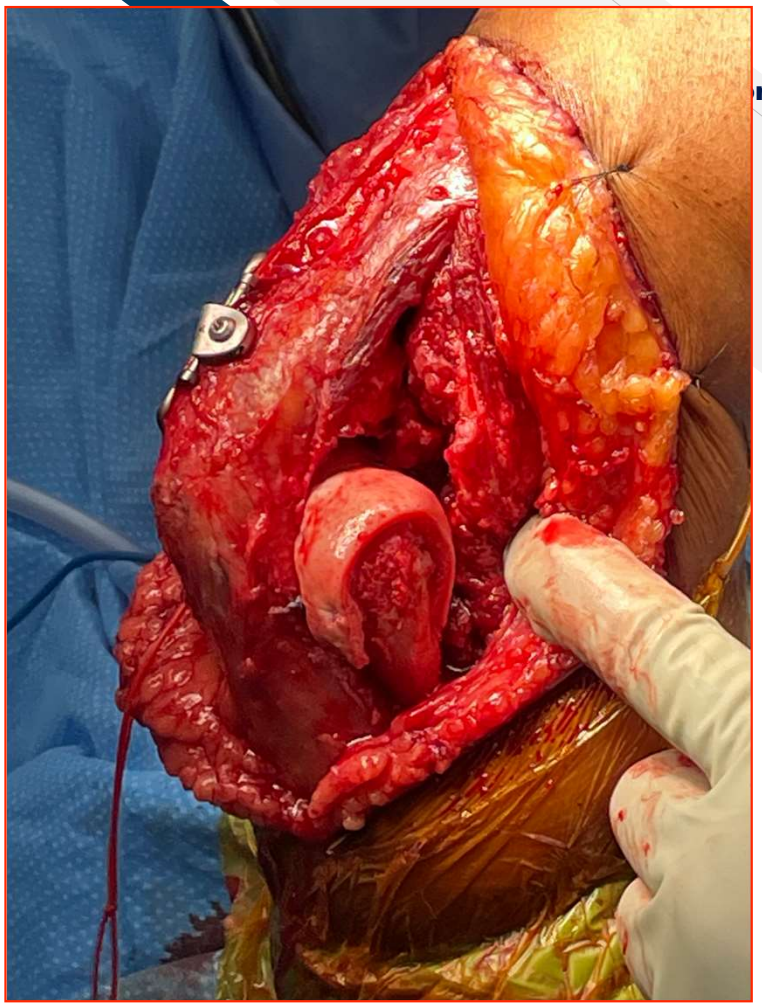




MCL preserved as hinge (or osteotomize med epicondyle)



Thick dermal allograft for re-surfacing (ArthroFLEX®)

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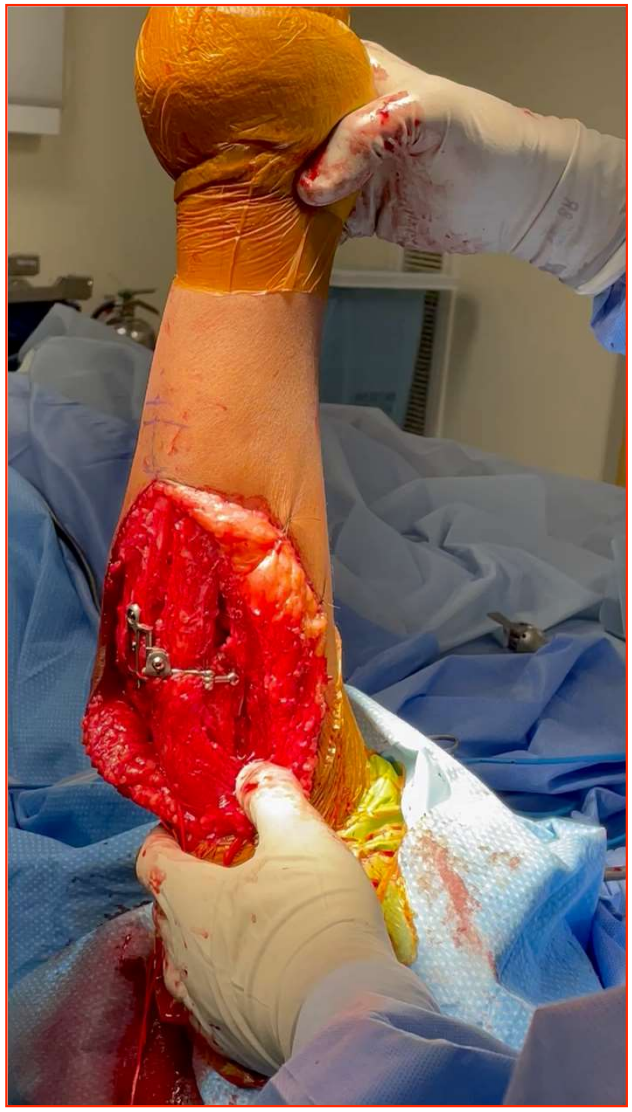
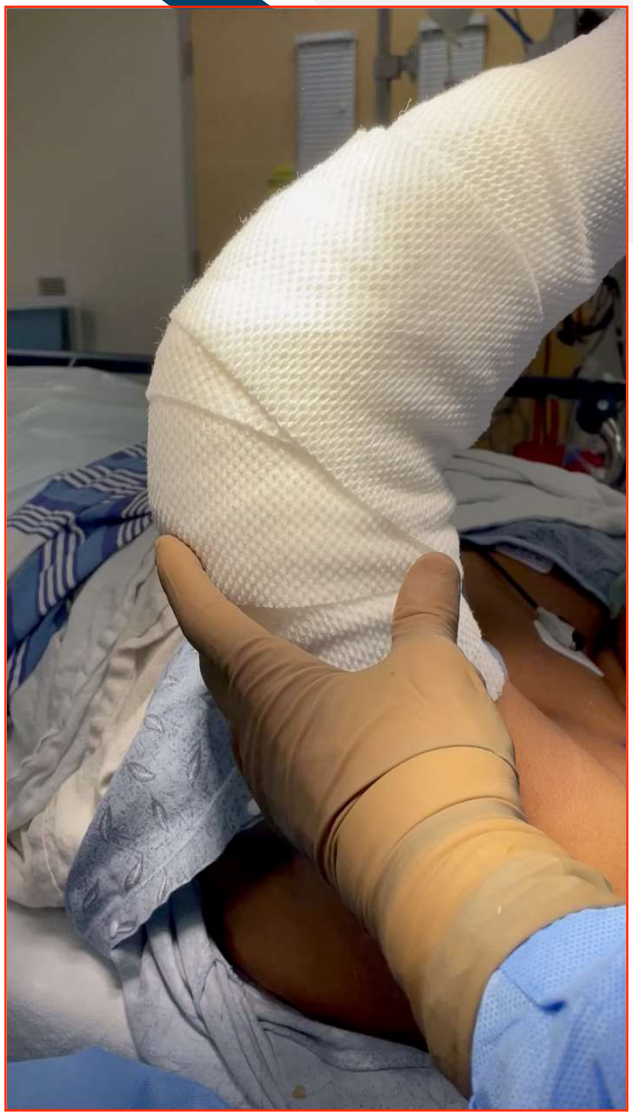
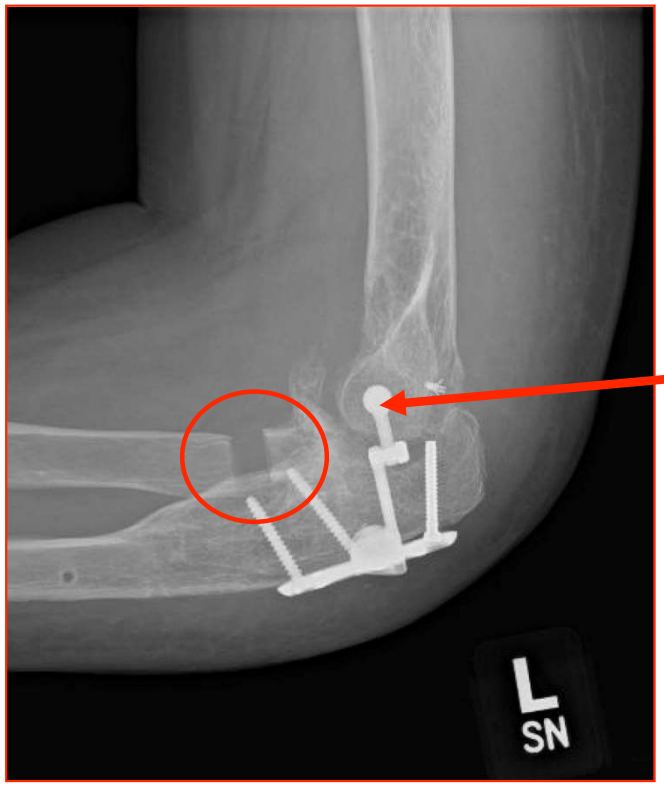
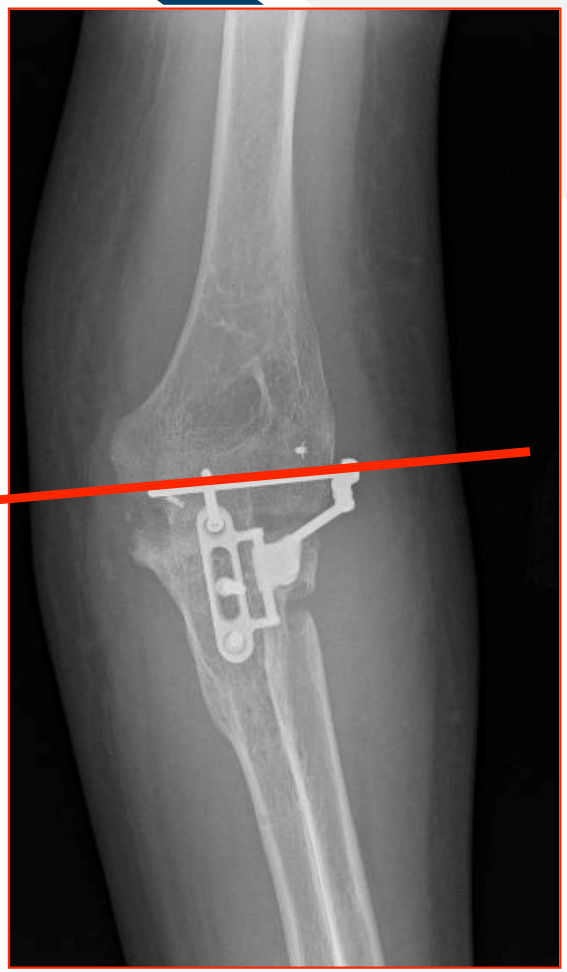




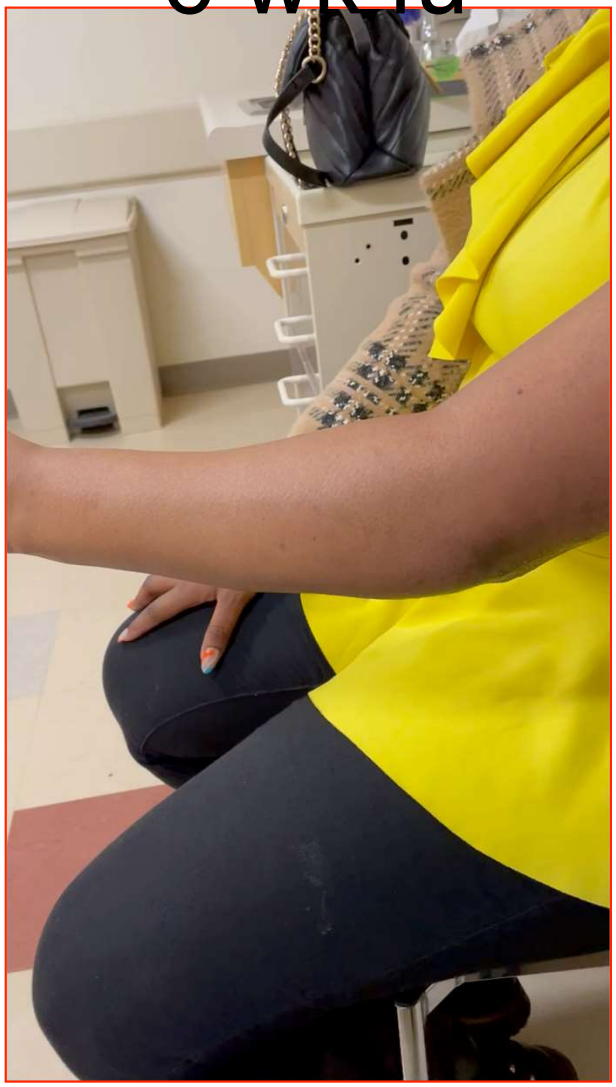




Restoration forearm rotation

Axis pin of IJS bisects troch spool

6 wk fu



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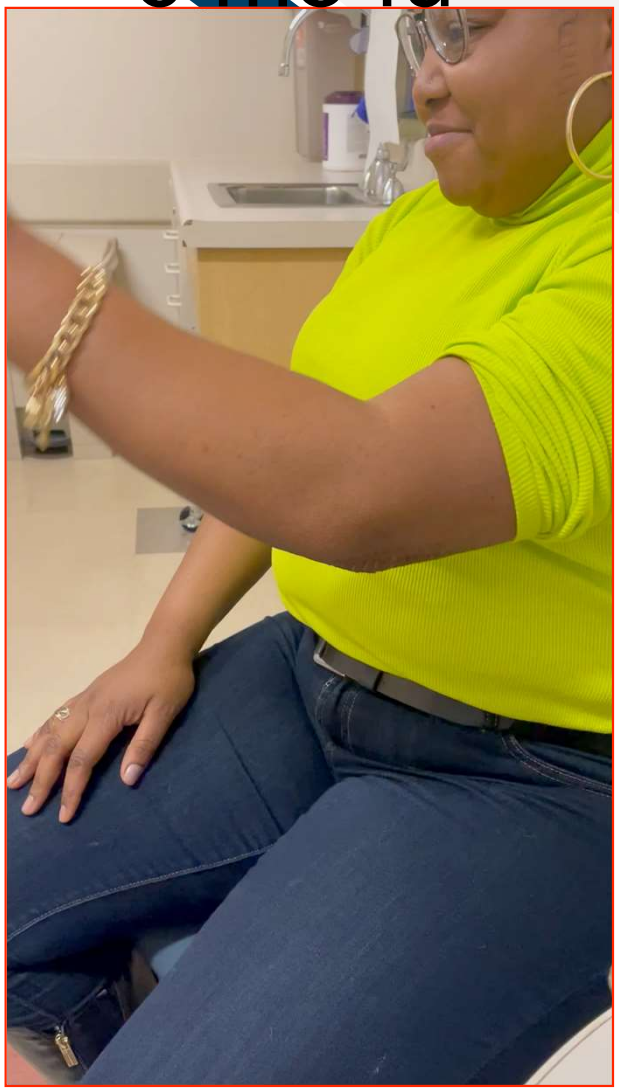

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Conclusions…

- Traumatic Arthritis of the Elbow in young patients is a challenging problem
- Of the available treatment options none is ideal
- **Interposition Arthroplasty potentially the best choice**
  - Adequate bone stock & stability are required
  - Ability to use an internal stabilizer for prolonged period of time combined with more durable interposition material *may* lead to more predictable outcomes…

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Thank You!

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Treatment of Traumatic Arthritis of the Thumb

Taylor A. Horst, MD
Excel Orthopaedic Specialists

Disclosures

- None

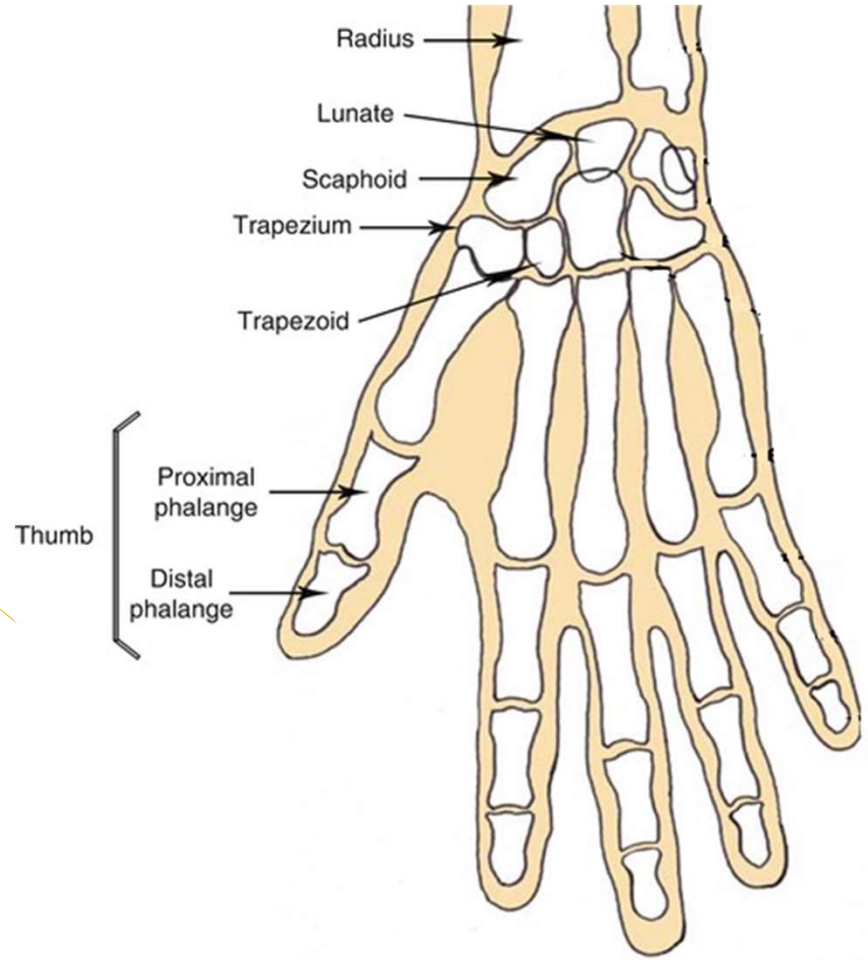
Objectives

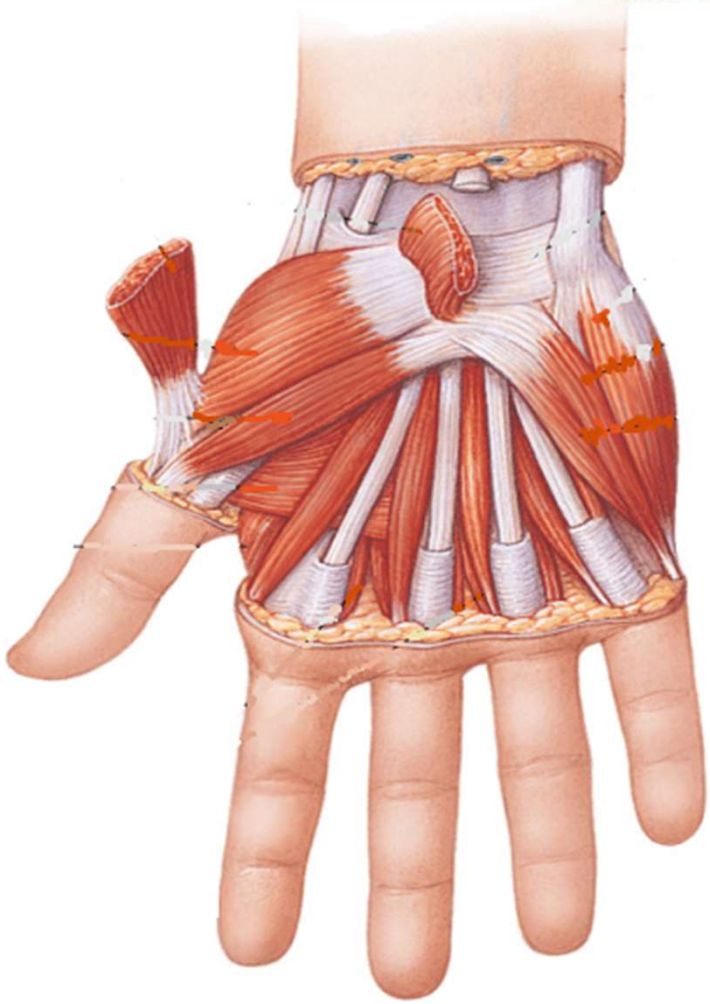
- Discuss the anatomy of the MCP and CMC joint
- Review examination of MCP and CMC arthritis
- Discuss available nonoperative treatment options and their effect
- Briefly understand the surgical treatment options and for whom they may be beneficial

Thumb MCP and CMC Arthritis

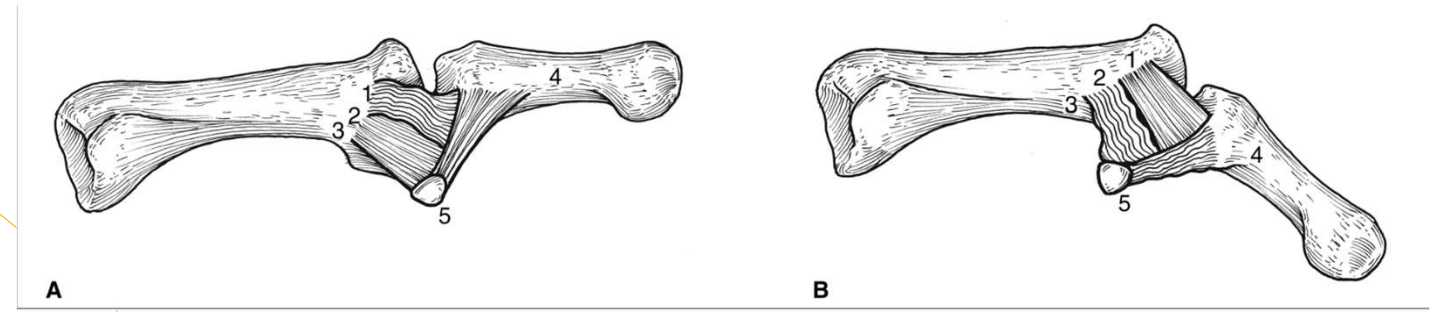
- Rheumatoid/Inflammatory causes
- Osteoarthritis
- Crystalline arthropathies
- Posttraumatic causes
- CMC arthritis – as high as 15% in adults over 30
- MCP arthritis – incidence unknown
  - Chronic repetitive trauma in heavy labor occupations may contribute

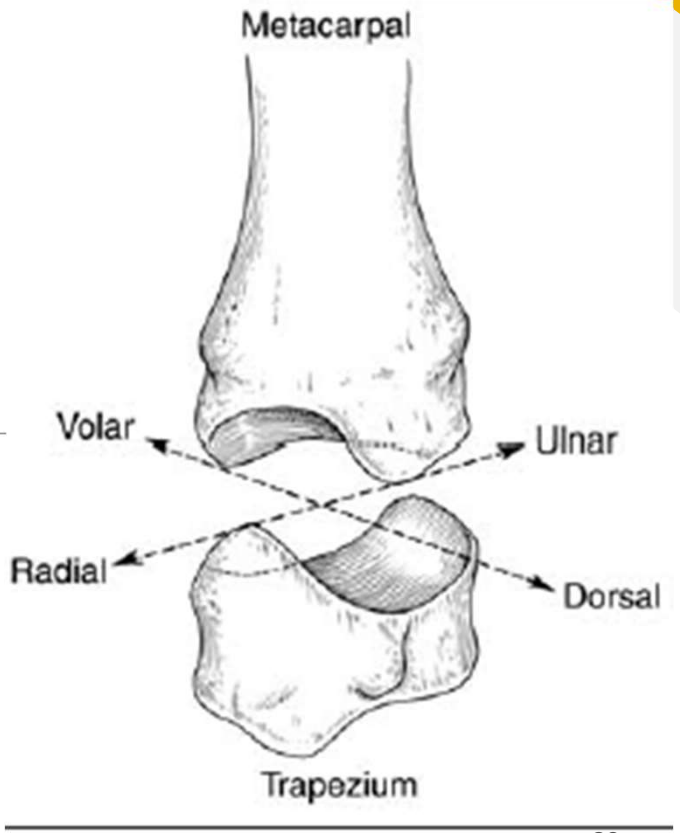
MCP & CMC Joint Anatomy





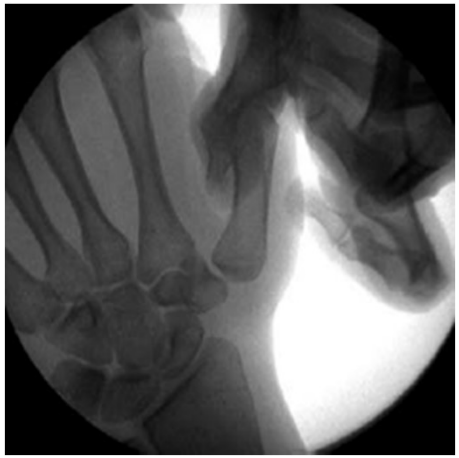
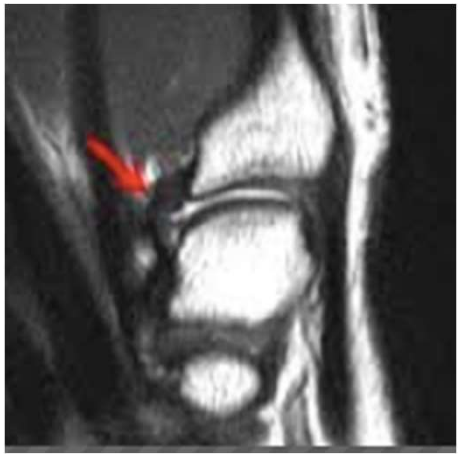
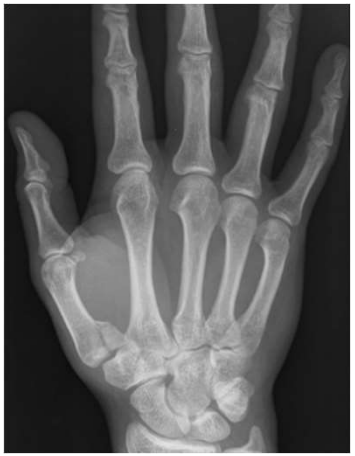
MCP & CMC Joint Anatomy





CMC Pathophysiology of Disease

- Multifactorial
  - Intrinsic
  - Posttraumatic causes

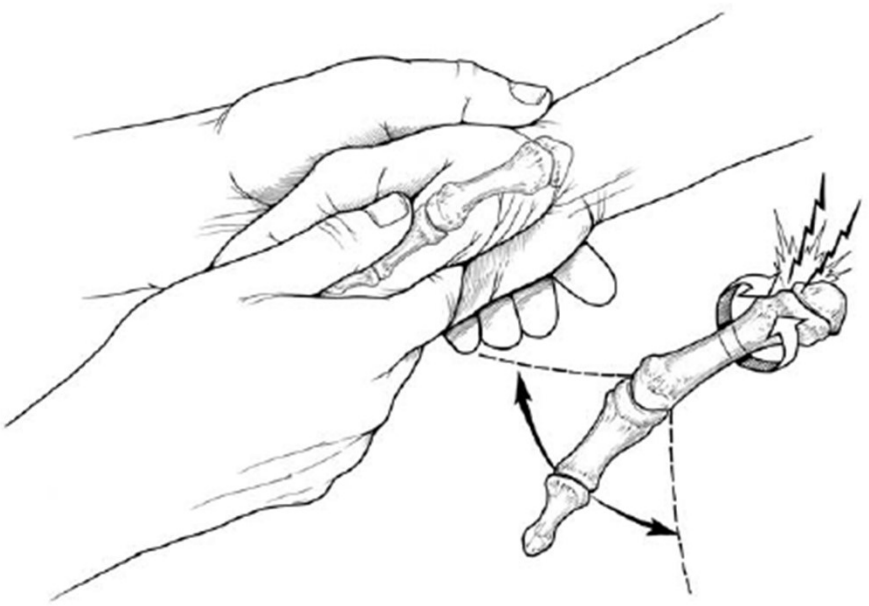




Clinical Presentation: Arthritis

- Pain
- Swelling
- Limited range of motion

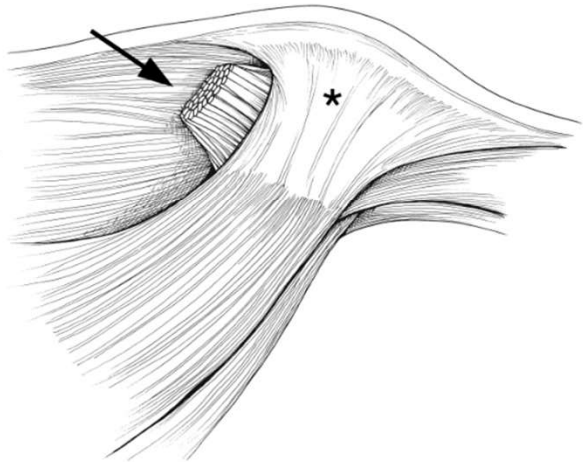
Clinical Exam

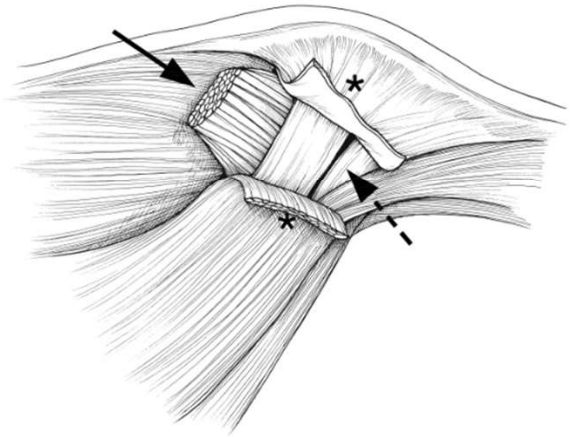
- "Shoulder sign" = dorsoradial prominence
  - Subluxation
  - Inflammation
  - Osteophystes
- Adduction contraction
- MP hyperextension
- Localized swelling and warmth
- Grind test
- Crank test
- Pinch Test – MP hyperextension collapse
- Distraction Test – relief of pain

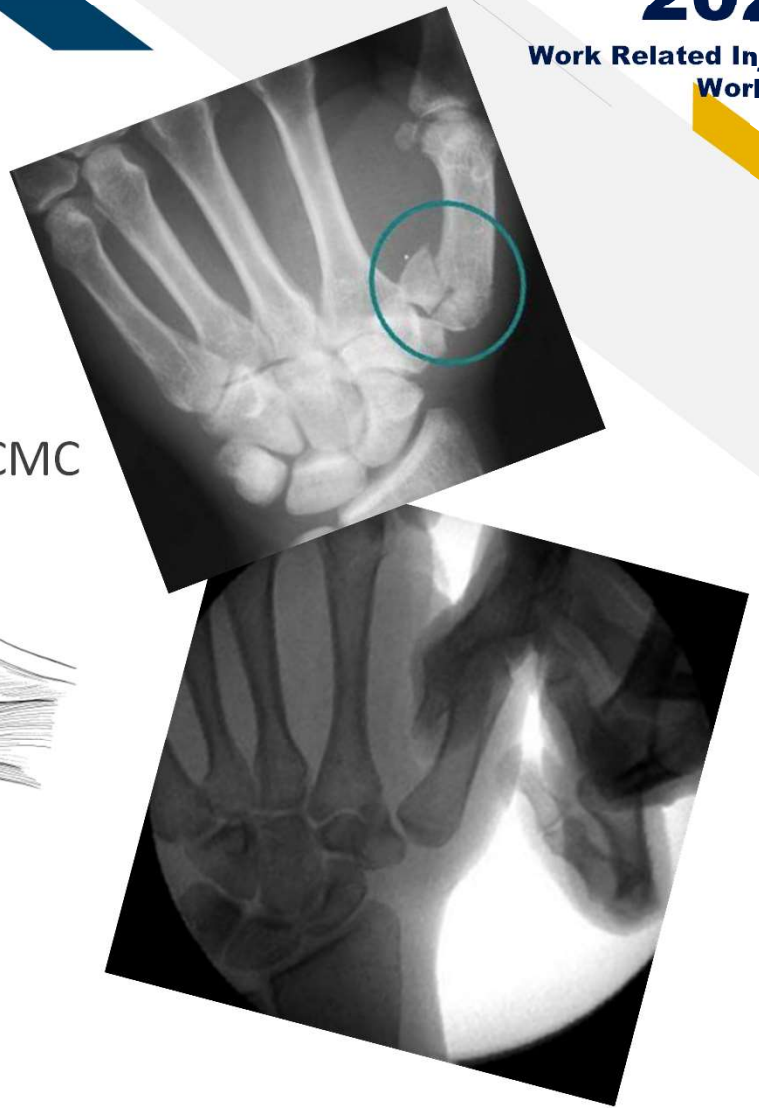


Trauma

- MCP proximal phalanx fracture
- Chronic MCP joint laxity
- Injury to anterior oblique ligament for CMC
- Bennett fracture resulting in joint incongruity of CMC







Progression Theory

- Excessive laxity + repetitive loads
- Synovitis
- Osteophytes + joint space narrowing
- Attenuation/insufficient volar beak ligament
- Dorsal radial subluxation of 1st MC base
- Adducted posture of 1st MC
  - Distal aspect tethered to 2nd MC by adductor pollicis
  - Metacarpophalangeal joint hyperextension
- Progressive functional deficit
  - Decreased grip
  - Narrowed palm, function hand width

Nonsurgical Treatment of Thumb Arthritis

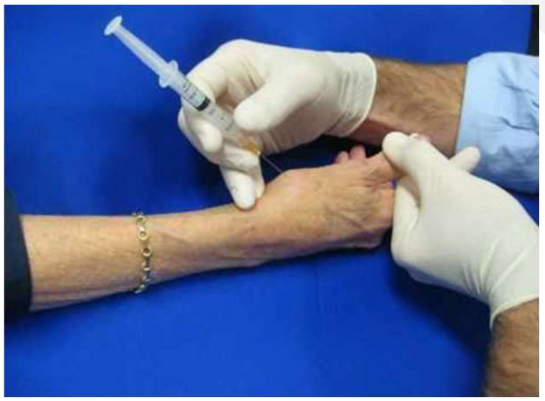
- Job modifications
- NSAIDs
- Splinting
- Corticosteroid injections

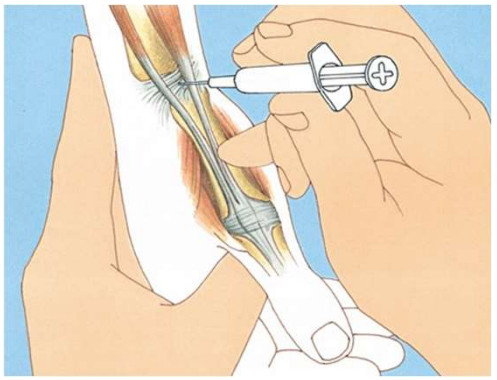
Splinting

- Splinting with thumb in abduction has been shown to decrease pain
- Several options available
- Swigart et al. J Hand Surg 1999
  - Reduce symptoms by average of 55% to 60% in the first 6 months
  - Decrease in pain in 76% of pts with stage I and II disease

Corticosteroids

- In contrast, Day et al. J Hand Surg Am 2004
  - Steroids in conjunction with splinting successful at average follow-up of 18 mo
  - Steroid injection with splinting provided reliable long-term relief in thumbs with Eaton stage 1 disease
  - Long-term relief in only 7 of 17 thumbs with Eaton stage 2 and stage 3 basal joint arthritis





SCIENTIFIC ARTICLE

Conservative Treatment of Thumb Base Osteoarthritis: A Systematic Review

Anne J. Spaans, MD, L. Paul van Minnen, MD, PhD, Moshe Kon, MD, PhD, Arnold H. Schuurman, MD, PhD, A. R. (Ton) Schreuders, MD, PhD, Guus M. Vermeulen, MD, PhD

J Hand Surg Am. 2015;40(1):16e21

(1) Hand therapy can possibly reduce pain. However, lack of good quality (randomized controlled) trials.

(2) Although both steroid and hyaluronate intra-articular injections can provide pain relief, most authors conclude that injection of hyaluronate is more effective

(3) The use of orthoses reduces pain without effect on function, strength, or dexterity.

(4) There is no justification for the use of transdermal steroid delivery

(5) There are no high-level evidence studies specifically evaluating the effect of analgesics and patient education in joint protection in patients with thumb base OA

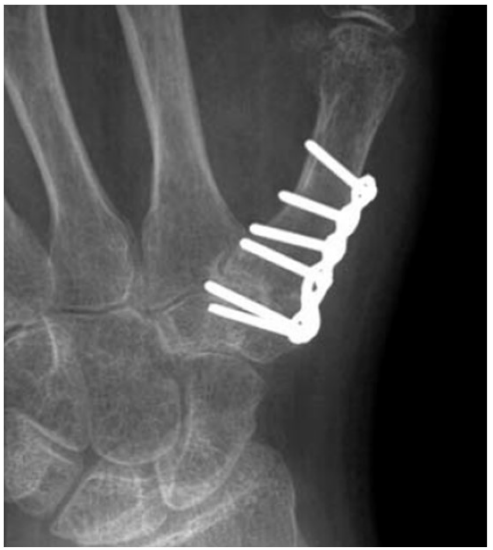
Surgical Treatment Options

- Radiographic stage, symptoms, & deformity determine procedure

- Trapezium excision
- Excision + Rolled Tendon Graft (anchovy)
- Silicone Arthroplasty
- Arthrodesis
- Osteotomy of 1st MC
- Volar ligament reconstruction
- Ligament reconstruction and tendon interposition (LRTI)
- Double interposition arthroplasty
- Interposition costochondral allograft
- Cemented Arthroplasty
- Cementless Arthroplasty
- Ceramic Arthroplasty
- Suture suspension

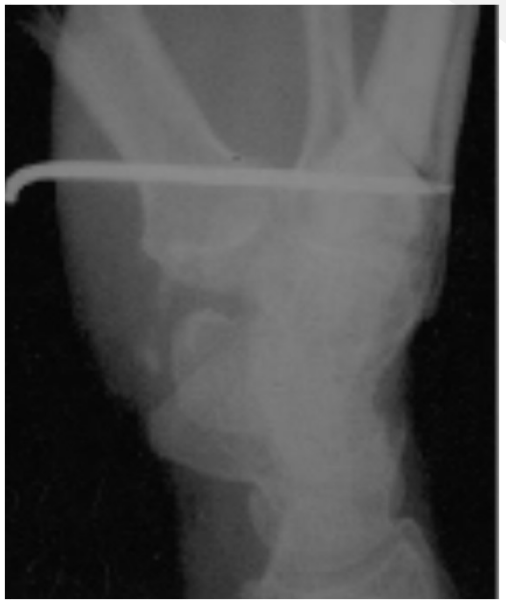
Fusion

- Indicated for:
  - Painful instability secondary to systemic joint laxity
  - Patient younger than 50 in a high-demand job
  - Isolated CMC Eaton II/III
    - STT joint should be spared
- Advantages: stable thumb, improved strength, pain relief and joint stability
- Disadvantages: development of adjacent joint degeneration, high nonunion rate, prolong post-operative casting

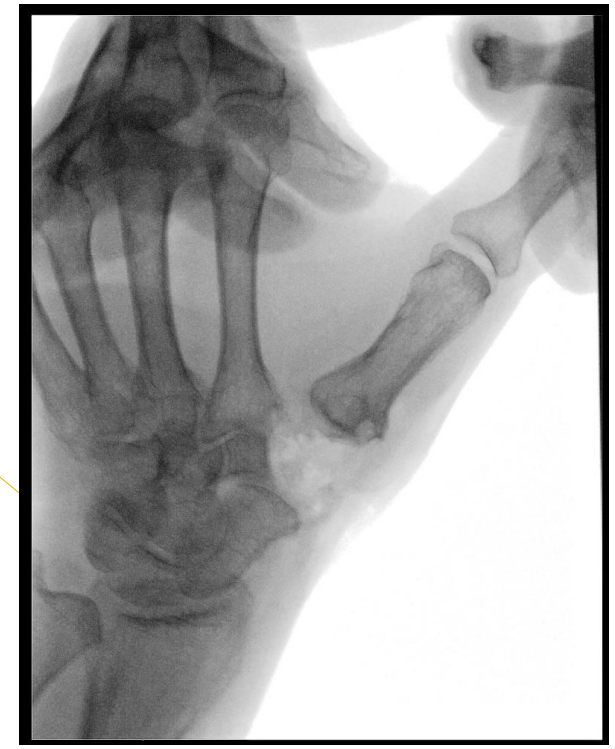


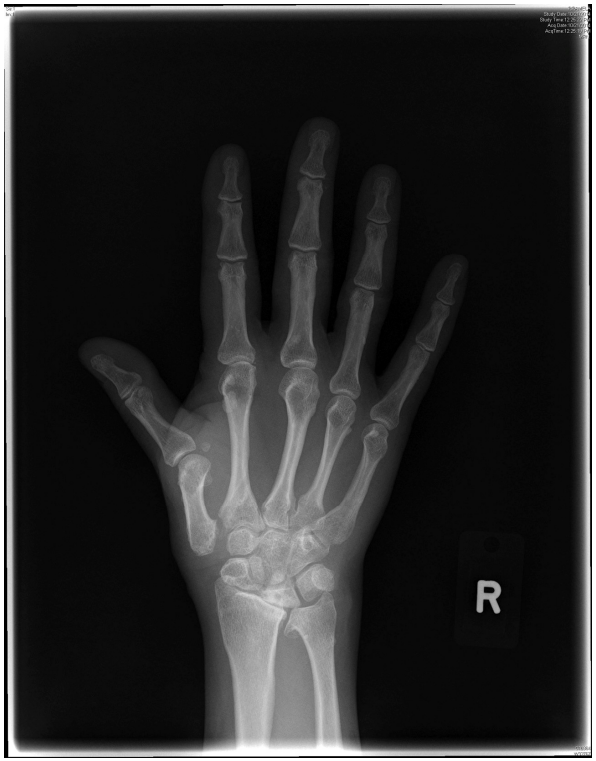
Trapeziectomy +/- LRTI

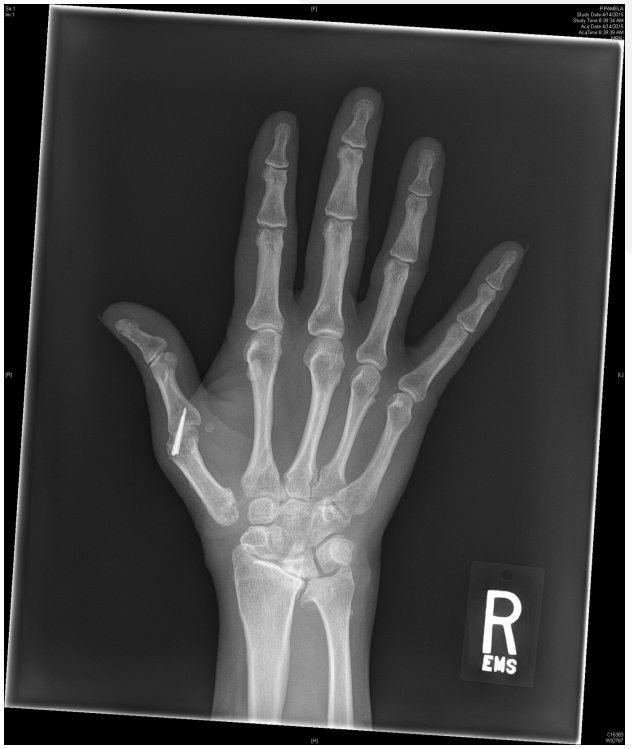
- Gold standard procedure for treatment of CMC arthritis
- Eaton III/IV patient who has failed conservative treatment
- Progression back and forth to what is favored today



Postoperative Radiograph







Five- to 18-Year Follow-Up for Treatment of Trapeziometacarpal Osteoarthritis: A Prospective Comparison of Excision, Tendon Interposition, and Ligament Reconstruction and Tendon Interposition

Soham Gangopadhyay, MSc, Helen McKenna, Dip COT, Frank D. Burke, MBBS, Tim R. C. Davis, ChM

- 153 thumbs : 5-18 year follow-up
- 78% maintained “good” results
- ***no difference*** between groups in strength, ROM, function, or complications
- LRTI took 20 minutes longer than HDA

Summary

- Thumb is very important
  - It’s what makes us human
- Complex anatomy predisposes it to arthritis
- Nonsurgical treatment options should be used before any surgery
- Numerous surgical options available for both MCP and CMC arthritis with trapeziectomy +/- LRTI being the gold standard in the MCP

Thank You!

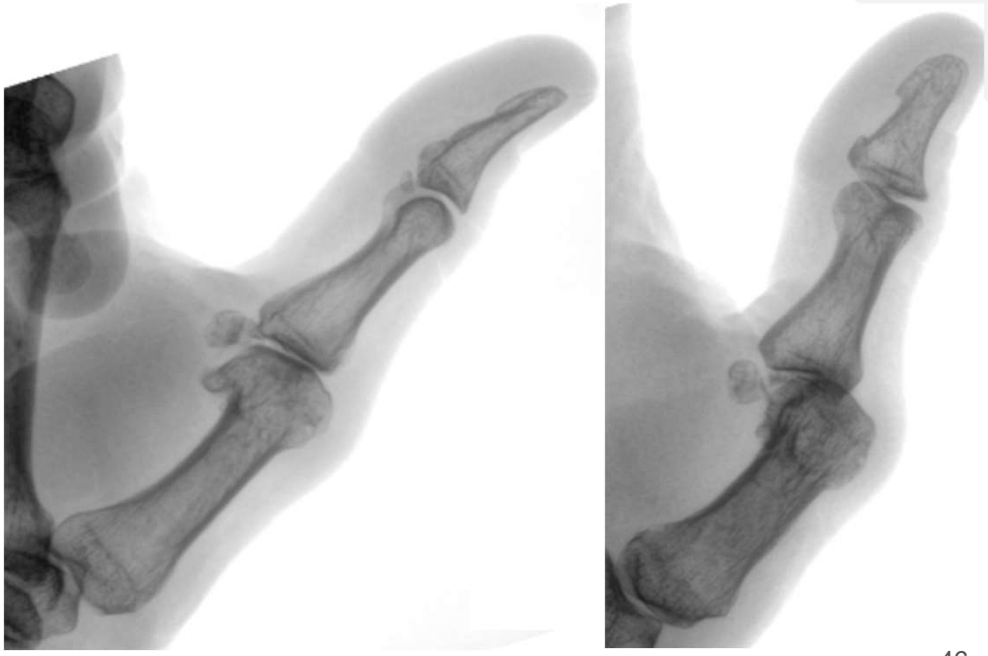
2024
Work Related Injuries
Workshop

CASE DISCUSSION

Hervey L. Kimball MD,MS
Boston Sports and Shoulder Center
New England Baptist Hospital

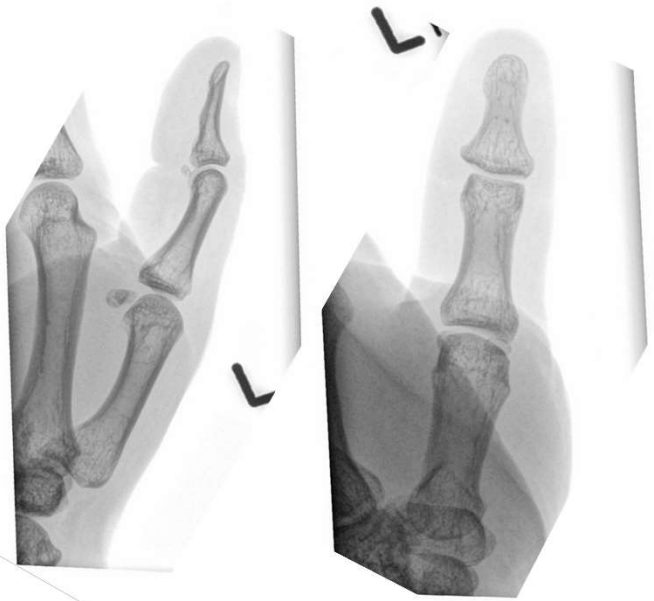
JR: 53 yo Laborer

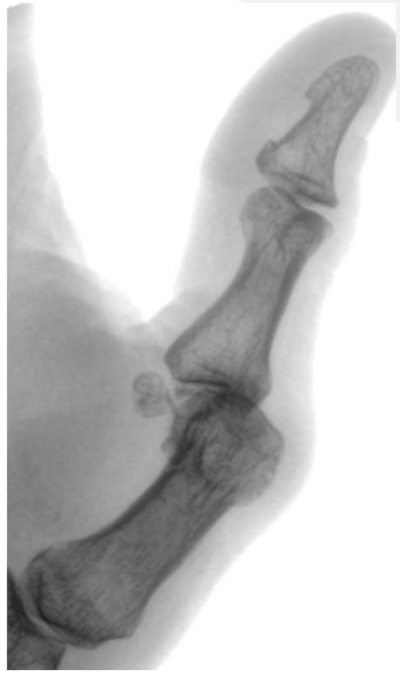
- **Injury to thumb**: several episodes in 2022
  - Twisting mechanism using a drill
- **Exam**
  - Laxity & Crepitus @ MP joint
  - Tenderness at joint, effusion
- **Radiographs**



JR: 53 yo Laborer

- **Diagnosis**: Thumb MP arthritis
  - Pre-existing allegedly without symptoms





- Ligament instability

Degenerative joint

JR: 53 yo Laborer

- **Thumb MP arthritis**
  - Pre-existing allegedly without symptoms
  - Ligament instability ⇨ Degenerative joint

- **Aggravation**
- **Predominant cause for symptoms**
- **Exacerbation**
- How do these concepts impact the coverage or employer?

JR: 53 yo Laborer

Pre-existing now symptomatic arthritis

- **Employee has the burden of proof**

CAUSATION

- As is/But for/Simple causation:

  But for the injury the worker would not be disabled

JR: 53 yo Laborer

Pre-existing now symptomatic arthritis

Exacerbation or Aggravation?

- **Exacerbation** : after some time to heal, your injury will return to its baseline condition
- **Aggravation** : underlying condition is permanently worsened as a result of your injury?

JR: 53 yo Laborer

Pre-existing now symptomatic arthritis

MAJOR but not necessarily PREDOMINANT CAUSE

- When a work injury combines with a pre-existing condition to cause or prolong disability
- Higher burden of proof than as is causation
- What is a pre-existing condition under the statute?
  - Arthritis?
  - Degenerative disease?

JR: 53 yo Laborer

- **Injury to thumb**: several episodes in 2022
  - Twisting mechanism using a drill.
- **Treatments**
  - Activity/Job modifications
  - Splinting
  - Cortisone injection

JR: 53 yo Laborer

Pre-existing now symptomatic arthritis

Risk Management

- What is needed from providers and physicians?
  - Documentation
  - Expectations
    - Duration of care
    - Timeline RTW : modified & full duty

JR: 53 yo Laborer

Pre-existing now symptomatic arthritis

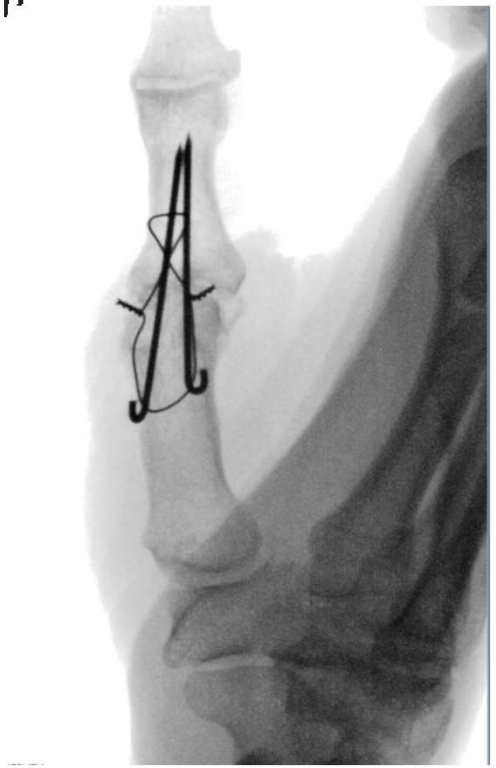
Risk Management

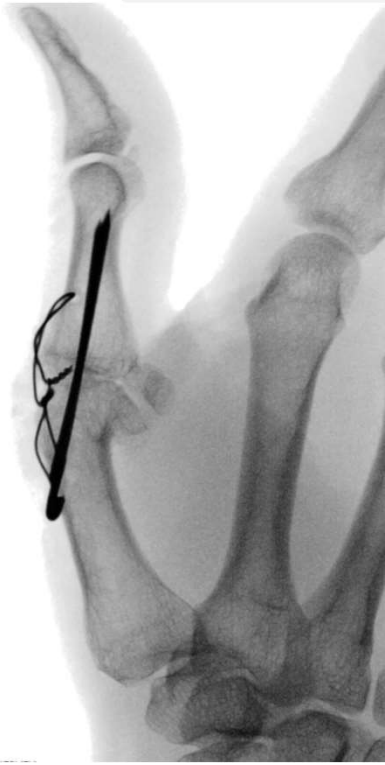
- Challenges in dealing with such injuries?

JR: 53 yo Laborer

- **Injury to thumb**: several episodes in 2022
  - Twisting mechanism using a drill
- **Treatments**
  - Activity/[illegible]dification
  - Splinting
  - Cortisone injection
- **Surgery**
  - **FUSION of MP Joint**

FAIL



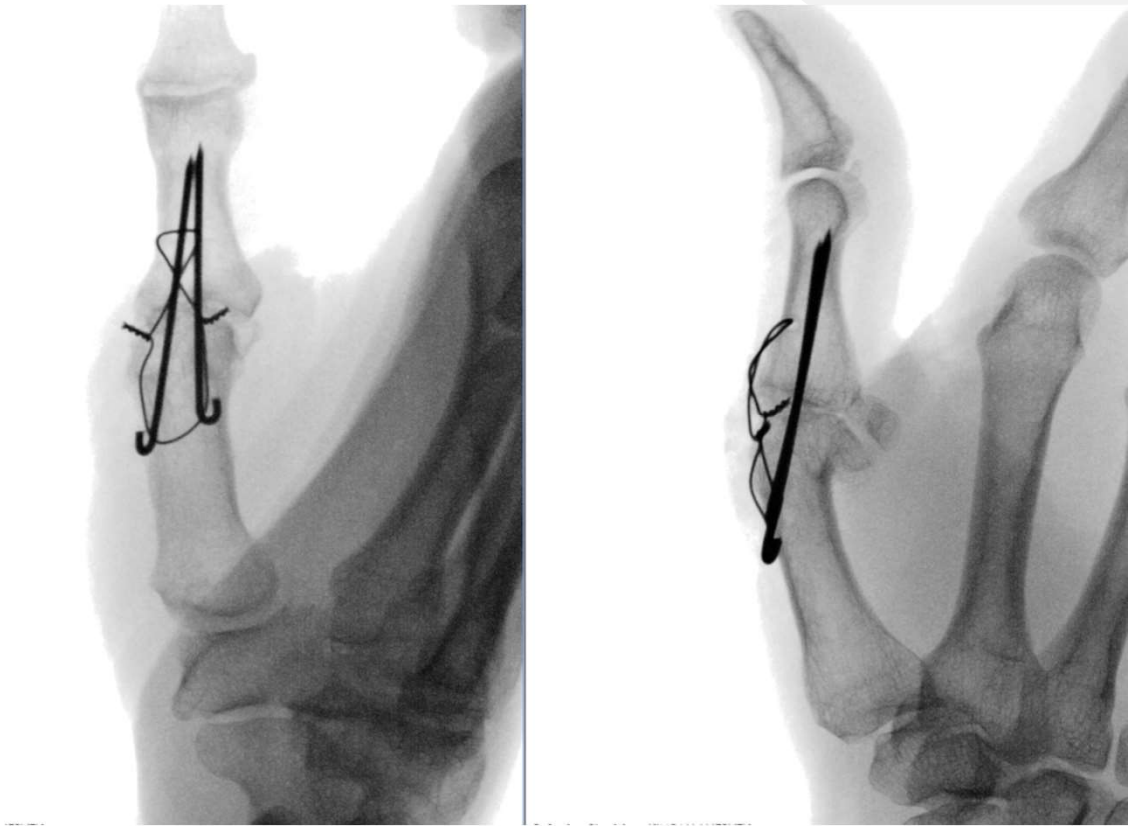


JR: 53 yo Laborer

- Surgery
  - FUSION of MP Joint

↓ continued pain

- Second Procedure
  - Hardware removal
    - Solid fusion noted



JR: 53 yo Laborer

3 months after MP fusion hardware removal

“I don’t feel ready to return to full duty”

Physical Therapy

- Work Hardening
  - When is it helpful?
- Functional Capacity Evaluation
  - How subjective is it?

QUESTIONS


HORST, MD


STEIN, MD


ANASTOS, JD


MATTIE, DPT


PIERCE, JD