



## CMC Arthritis/ Instability w/ Dr. Gray Notes

### 1st CMC joint

- 2nd most common site of arthritis in the hand
- Affects postmenopausal women in 5th decade of life
- Articulation between 1st metacarpal of thumb and trapezium

### Anatomy

- Biconcave-convex saddle joint
- CMC joint motion- adduction-abduction / flexion-extension / axial rotation
- CMC joint lacks bony confinement- ligaments help stabilize
  - Anterior oblique ligament (beak) most important
    - AOL- originates on palmar tubercle of trapezium + attaches to articular margin on ulnar aspect of metacarpal beak (restrains dorsal translation during key and lateral pinch)
  - Ligament laxity> inc loads on CMC joint> Cartilage loss> Bony impingement + pain
  - Makes joint incongruent during pinch

### History

- Chronic- after repeated microtrauma
- Pain in proximal thenar muscles
- Hypermobility from capsular damage
- Marfan syndrome, RA
- Premenopausal women
- NK hand assessment system?

### Physical exam

- ROM, grip + pinch strength & dexterity
- Chronic- point tenderness on radial margin of thumb metacarpal base, distal to navicular bone
- Pain w/ dorsal subluxation of the metacarpal

## Imaging

- AP, oblique, lateral
- True lateral perpendicular to plane of hand (gedda)
  - Look for incongruence of the trapeziometacarpal articulation
  - CT scan- may be useful to evaluate joint + any fractures
- Eaton + little- AP view of bilateral thumbs w/ radial margins pressed together- helps show instability
- - assess- trapeziometacarpal joint space + assess degree of articular damage

## Classification

- Eaton and littler
  - Stage 1- early synovitis- slight widening of joint space, normal articular contours, less than  $\frac{1}{3}$  joint subluxation
  - Stage 2- capsular laxity, at least  $\frac{1}{3}$  joint subluxation, presence of < 2mm osteophytes
  - Stage 3- progressive joint subluxation, joint space narrowing, greater and larger osteophyte formation + cystic and sclerotic subchondral bone changes
  - Stage 4- degenerative changes at scaphotrapeziotrapezoid joint

## Non op tx

- Eaton stage 1- activity modification (repetitive pinch, hyperabduction, hyperextension) , splints, NSAIDs, cortisol injections
  - Can help up to 80% of patient w/ stage I arthritis
  - Help up to 25% stage IV patients
- Custom thumb spica splint
  - MP joint positioned at 30 deg flexion can help unload CMC joint
  - Thenar strengthening program- enhance action of first dorsal interosseous muscle to stabilize the joint

## Operative management

- Eaton stage II-IV
- Metacarpal osteotomy
  - Indicated for reduced but unstable + pre arthritic thumb CMC joints
  - Unloads the volar compartment cartilage + tensions dorsal ligaments. Creates more stable environment during lateral pinch
  - Useful for pts w/o significant cartilage loss w/ most cartilage loss at volar surface
- Arthroscopy
  - Evaluation, debridement, synovectomy, + thermal shrinkage of stabilizing AOL + DRL w/ chronic thumb CMC hypermobility or early arthritis
- Trapezial excision
  - Problems w/ grip strength
- Open reduction and ligament repair or reconstruction
  - Principles:

- removal of abnormal bony surface through partial or complete trapezial excision
- Reconstruction of ligament to stabilize joint
- Interposition of a substance to reduce axial shortening of metacarpal and to prevent bony impingement
- EPB or APL reinforces the dorsal capsule/ redirects pull of APL to create new dorsal ligament
- FCR reconstruction- distal based strip is routed through a drill hole in base of first metacarpal from palmar to dorsal.
  - Useful w/ instability w/ minimal arthritis
- LRTI- may not maintain trapezial height and not restore thumb length fully
- Hematoma distraction arthroplasty
  - 1st metacarpal fixed to index finger in distracted position for 4-6 weeks w/ k-wire
- Implants
  - Silicone trapezial implants, graftjacket.
    - May lead to synovitis and instability / subluxation in 75 to 25% patients
      - 75% patients have good outcomes though
  - Artelon spacer
    - Prevents bony impingement through interposition of CMC joint and provides scaffold for autologous tissue regeneration

Sources:

Gillis, J., Calder, K., & Williams, J. (2011). Review of thumb carpometacarpal arthritis classification, treatment and outcomes. *Canadian Journal of Plastic Surgery*, 19(4), 134-138

Rabinovich, R. V., Polatsch, D. B., Shin, S. S., & Beldner, S. (2021). Thumb carpometacarpal instability. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*, 29(22), 943-950.