第一腕掌骨骨性关节炎的康复治疗

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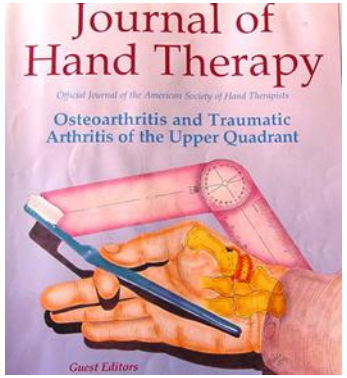
2015

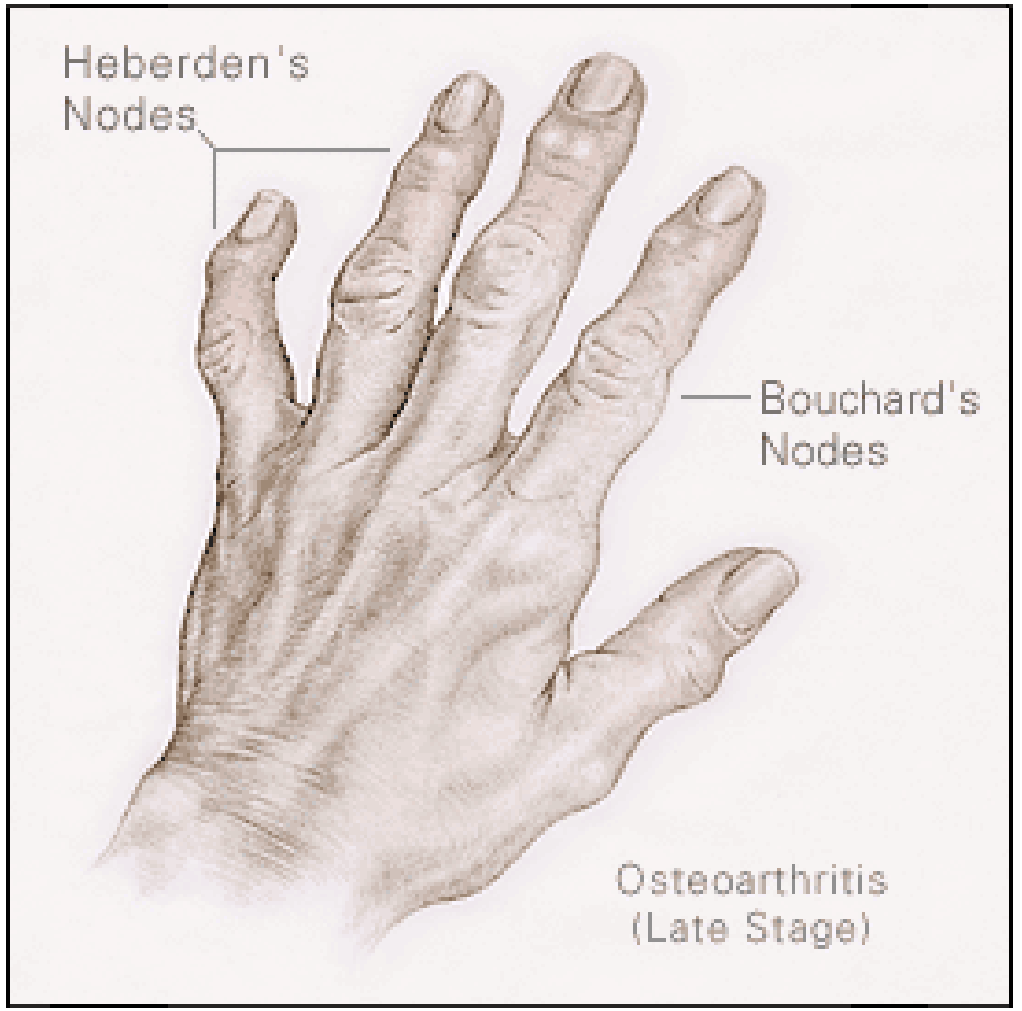


Hand Therapists

- Either OT or PT with post graduate experience and qualifications in Hand Therapy.
- Developed alongside increasing specialisation in the surgical field, which required equally specialised therapy to compliment.
- Active special interest group NZAHT, supports a Training program, annual conference and registered membership scheme.

Overview

- Aetiology
- Pathology
- Prevalence
- X-ray findings
- Classification
- Clinical Presentation
- Assessment
- Conservative Management
- Surgical Management



Aetiology

- Primary: idiopathic
- Secondary: pre-existing factor e.g. trauma, infection, abnormal anatomical configuration
- Underlying aetiology not well understood
  - ? ligamentous laxity → joint surface incongruity → smaller contact areas → articular stress → cartilage degradation

(Lin, 2014)

Pathology

- Early stages - Cartilage Degeneration
- Later stages – 2º changes as a consequence of degeneration
- Articular cartilage is a specialized type of hyaline cartilage
  - reduce friction
  - allows painless joint motion
  - withstands compressive forces
- Made up of chondrocytes embedded in an extracellular matrix
- Motion promotes joint health by diffusing synovial fluid
  - Important as cartilage is avascular and lacks a nerve supply

(Beasley, 2012)

Cartilage degeneration

- release of enzymes from chondrocytes – unknown stimulus
- swelling and splitting of cartilage due to uptake of water, producing variable cartilage loss – fibrillation & fragmentation
- inflammation of synovium and joint capsule from cartilage debris
- degradation of cartilage causes inability of cartilage to withstand compressive forces

(Beasley, 2012)

Consequence of Degeneration

- Bone on Bone – eburnation of subarticular bone
- Cysts in subarticular bone
- Osteophytes
- Hyperplasia of synovium
- Joint immobility
- Muscle wasting

Prevalence

- (OA) of the thumb carpometacarpal (CMC) joint is the second most common site of osteoarthritis in humans
- affecting up to 25% of women
- 7-8% of men
- (STT) joint arthritis can affect up to 16% of the population, mainly women over the age of 50

(Kapoutsis, 2011, Lin, 2013)

X-ray findings

- Narrowed joint space
- Articular erosions
- Subchondral bone sclerosis
- Osteophytes
- Subchondral cysts
- Deformity
- Does not correlate with symptoms

(Berger, 2015, Gabay, 2012)

FIGURE 1. Classic radiographic signs of stage III osteoarthritis with joint space narrowing, prominent osteophytes, and moderate subluxation the carpometacarpal joint (arrow).

(Ataker, 2012)

Classification

The Eaton-Glickel classification system most commonly used for radiographic staging of TMJ (Berger, 2015)

Stage 1	Slight joint widening
Stage 2	Slight joint narrowing, minimal subchondral sclerosis, and joint debris (osteophytes or loose bodies) less than 2 mm
Stage 3	Marked narrowing or obliteration of joint space, cystic changes, sclerotic bone, varying degrees of dorsal subluxation, and joint debris greater than 2 mm
Stage 4	Stage 3 deterioration plus scaphotrapezial joint narrowing with sclerosis and cystic changes

Clinical Presentation

- Joint swelling
- ↓ ROM, Grip & Pinch
- Muscle wasting
- Joint deformity
- Crepitus
- Functional limitations

Clinical Presentation - fingers

- DIPJs
  - Heberden’s nodules
  - mallet deformity
  - angulation

PIPJs

  - Bouchard’s nodules
  - angulation

MCPJs

  - rare
  - osteophytes can contribute to flexor triggering

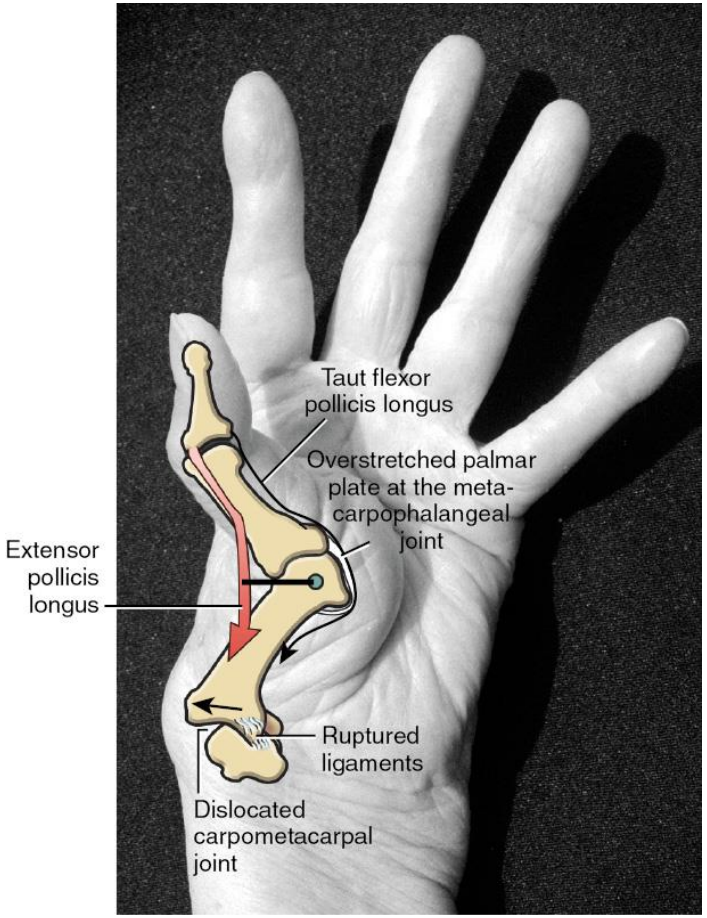
Clinical Presentation - thumb

± 40% of hand function and ¼ of overall bodily function
1kg of force at IPJ = 12kg at CMCJ

1st CMCJ (trapezio-metacarpal or basal joint)
STT arthritis

- Dorsal prominence/subluxation base 1st MC
- Flexion/adduction contracture
- Swan-neck deformity, instability of MCPJ
- Collapsing of MCPJ with pinch
- Loss of web space/adductor pollicis tightness

(Berger, 2015; Cooney, 1977; Shin, 2008)

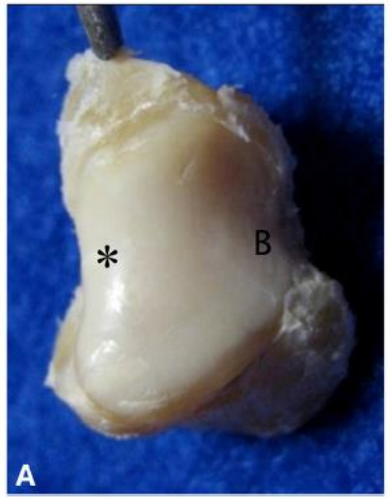


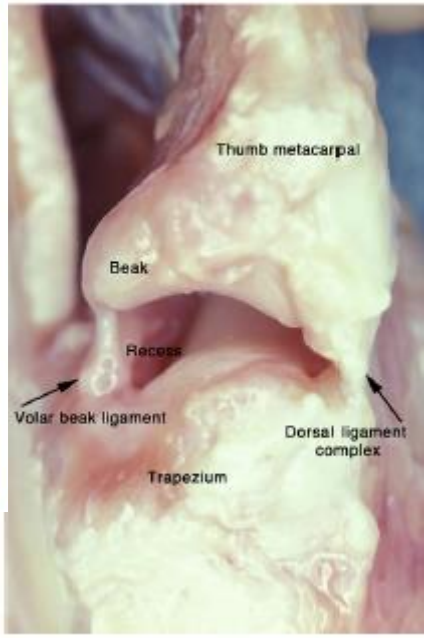
Bielefeld & Neumann, (2011)

CMCJ

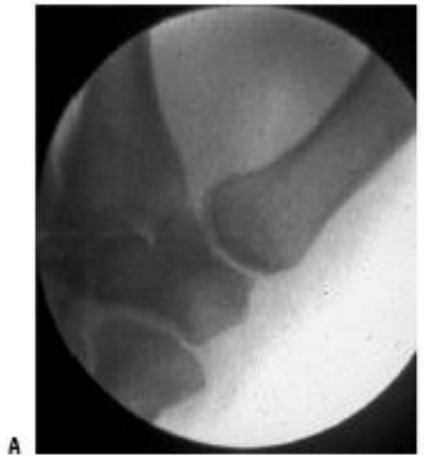
- 1st CMCJ is biconcavoconvex (saddle joint)
- Curved surfaces provide little intra-articular stability
- Prime stabiliser; dorsal ligament complex
  - Volar beak and dorsal ligament lax in resting position
  - volar beak ligament lax in opposition
  - dorsal ligament tightens and stabilises in opposition and pinch
  - also limits dorsal translation of 1st MC
- Dynamic stabilizers are 8 thenar muscles + 1st dorsal interosseous

(Edmunds, 2011, Ladd, 2013, Lin 2014, O'Brien, 2013)





(Edmunds, 2011)



AP view shows concave surface of trapezium
Lateral view shows convex surface of trapezium

Assessment

History

Occupational Performance

Occupational issues

Functional outcome measures

Observation

Dorsal subluxation/prominence base of 1st MC

Posture of thumb

Flexion/adduction contracture

Osteophytes

Muscle wasting

Examination

Radial wrist exam, exclude other pathologies (De Quervain, scaphoid #, ganglion, CTS, DR #, other arthropathies)

CMC grind test

Palpate trapezium and scaphoid

Stability of CMCJ; integrity of volar beak and dorsal ligaments

Stability of MCPJ under load

Muscle testing

Adductor tightness

Grip and Pinch strength

ROM; opposition, web space, abduction, extension

Dynamic loading of the thumb: The Coldtiz Tear Test

(Colditz, 2013)

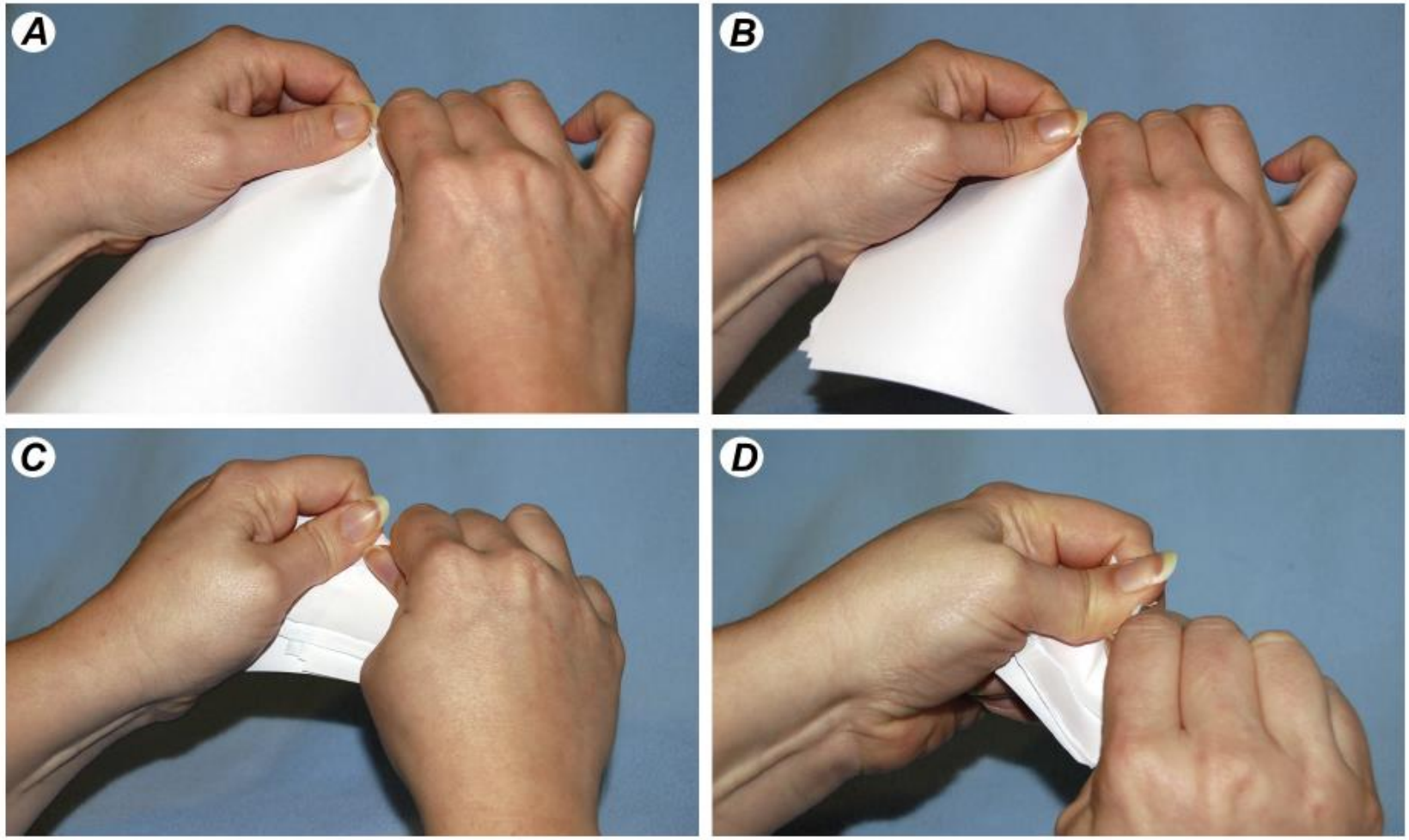


Fig. 1. (A-D) The progressively imbalanced posture of the left thumb is observed as increasing thicknesses of the paper are torn. Copyright Judy C. Colditz, 2013.

Conservative Management

Aims

Decrease pain

Prevent joint deformities

Increase hand function

Increase stability of 1st CMCJ

Increase strength

Modalities

Splinting (orthothes)

Education

Joint protection and adaptive devices

Strengthening exercises

- Grip and/or pinch
- Dynamic stability
- Upper limb, Neuro-muscular re-education

Heat

- Wax bath, contrast baths
- Ultrasound, Low-level laser therapy

Manual therapy

- MWMs
- Massage
- Manual muscle release

(O'Brien, 2014; Valdes & Marik, 2010)

Conservative management - evidence

Splinting (orthotics)	High to moderate evidence, significant improvements in pain and function
Education	
Joint protection and adaptive devices	Moderate support, effective in improving grip and hand function
Exercise	Moderate support for increasing strength decreasing pain, increasing ROM and function
Heat or Cold	Weak – moderate evidence for heat reducing pain
Massage and acupuncture	Insufficient studies
Analgesia and NSAIDs Hydrocortisone injection	

(Kjeken, 2011; Valdes, 2010; Ye, 2010)

Education Resource

http://osteoarthritis.about.com/od/jointprotection/a/jointprotection.htm

CMCJ Splints

Bani, 2013

Fig. 4. Custom-made neoprene thumb CMC orthosis with thermoplastic stabilization used in this study.

MWM and taping

Fig. 1. Mobilization with movement technique.

(Villafane, 2015) JHT Practice forum

Dynamic stability exercises

Aims

maintain web space

prevent adduction deformity

improve stability

limit stress on CMCJ

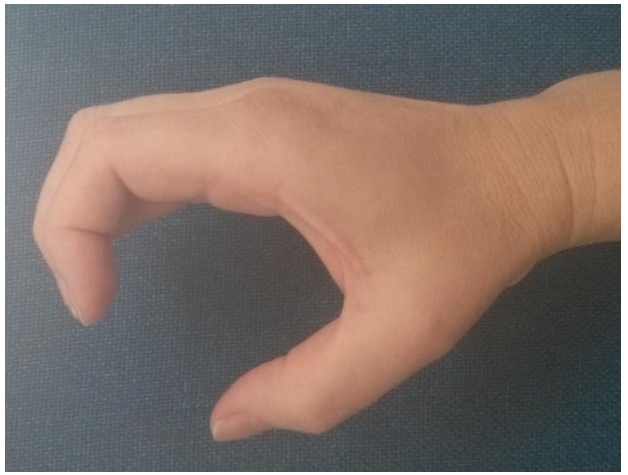
Principles

Restoration of 1st web space

Re-education of intrinsic and extrinsic mx (1st DI, opponens, abductors, extensors)

Muscle strengthening for patterns of stability

- Flexor/adductor forces > abduction/extension forces
- Strengthen thumb extensors and abductors (anti-deformity muscles)
- Care with EPL
- Avoid lateral and key pinch strengthening in advanced OA
- No RCTs; increasing evidence for reducing pain and disability

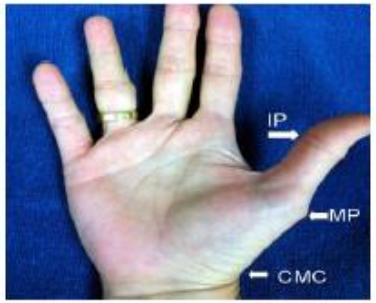


(Colditz, 2013; O'Brien, 2013; Valdes, 2012; Valdes, 2013)

http://handlab.com/resources/wp-content/uploads/2014/10/CP17-Thumb-CMC-Osteoarthritis.pdf

APPENDIX B. ROM Exercises for the Thumb

Do the exercises as taught by your therapist
Move the joints as far as you can without forcing them
Always stretch gently. Hold for about 30–60 sec at the point of feeling tightness or slight discomfort
Do not bounce. You should feel a stretch but not pain
Perform each exercise for at least four repetitions
Exercises should be performed 2–3 d per week



ROM Exercises	*Starting Position*	*Ending Position*	*Description*
AROM: Thumb flexion *PROM*: Same as AROM but assist with the other hand			1. Start with thumb extended as far as possible away from the palm 2. Flex the tip of the thumb to the base of the small finger
AROM: Thumb abduction *PROM*: Same as AROM but assist with the other hand			1. Start with thumb lying flat against palm in line with the index finger 2. Spread thumb as far away from the palm as possible in the same line as the index finger
AROM: Thumb opposition *PROM*: Same as AROM but assist with the other hand			1. Touch thumb to the tip of each fingertip alternately
AROM: Thumb CMC extension *PROM*: Same as AROM but assist with the other hand			1. Spread out thumb as far as possible from palm 2. Caution: Do not hyperextend the thumb MP joint
AROM: Thumb IP flexion *PROM*: Same as AROM but assist with the other hand			1. Bend just the tip of the thumb (IP joint)

(Valdes & von der Heyde, 2012)

Thumb MCP, PIP and DIPJ splints

Hydrocortisone Injection

- Analgesic
- Lasts 6-12 months
- Usually maximum of 3
- Can delay or avoid need for surgery
- Less painful than shoulder cortisone injection!
- Risks
  - Hypopigmentation and subcutaneous fat atrophy (10%)
  - Infection (low risk)

Surgical Management - DIPJ

- Arthrodesis
- ~20º Flex
- Immobilise DIPJ until fused
- Mobilise other joints

Surgical Management – PIPJ / MCPJ

- Arthrodesis
- Arthroplasty

  -silastic

  -pyrocarbon

Silastic Arthroplasty

Pyrocarbon Arthroplasty

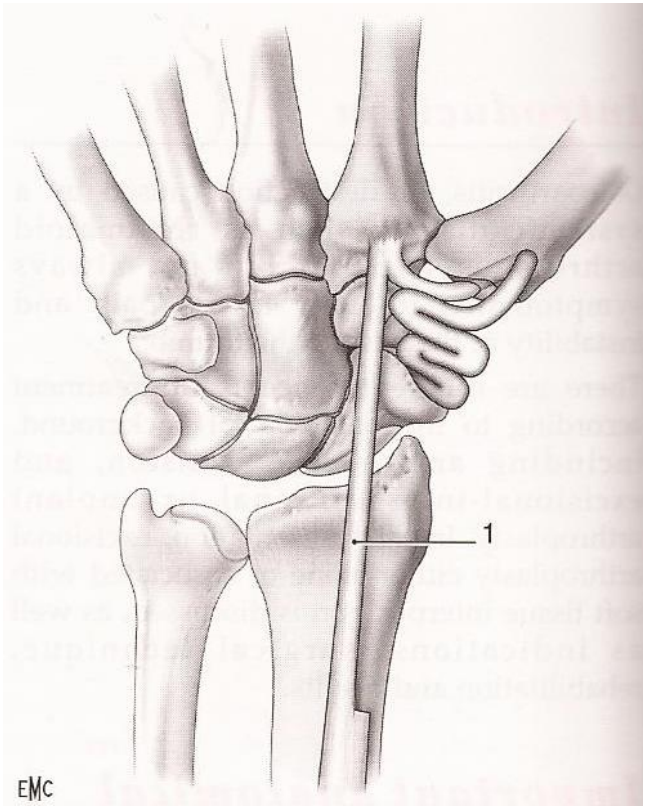
Surgery – Thumb CMCJ

- Arthrodesis
- Arthroplasty
- Trapeziectomy
- Trapeziectomy & LRTI (suspension arthroplasty)

(Berger, 2015)

Trapeziectomy and LRTI (suspension arthroplasty)

- Removal of trapezium
- Suspension of the 1st Metacarpal by routing local tendons through the 1st MC (FCR or APL)
- Fill the trapezoidal void with tendon ‘anchovy’
- Mobilization varies per surgeon, may start as early as 2/52, usually from around week 4
- MCP may be fused in flexion or k-wired
- TMJ arthroplasty not common, considered to be unsuccessful



(Ataker, 2012; Berger 201; Klenifleter, 2011)

Surgery – wrist .

- STT Arthrodesis
- Proximal Row Carpectomy (PRC) +/- radial styloidectomy
- 4 Corner Fusion (Lunate, Capitate, Hamate, Triquetral) +/- r/o scaphoid
- Arthrodesis
- Arthroplasty

Courtesy of Harry

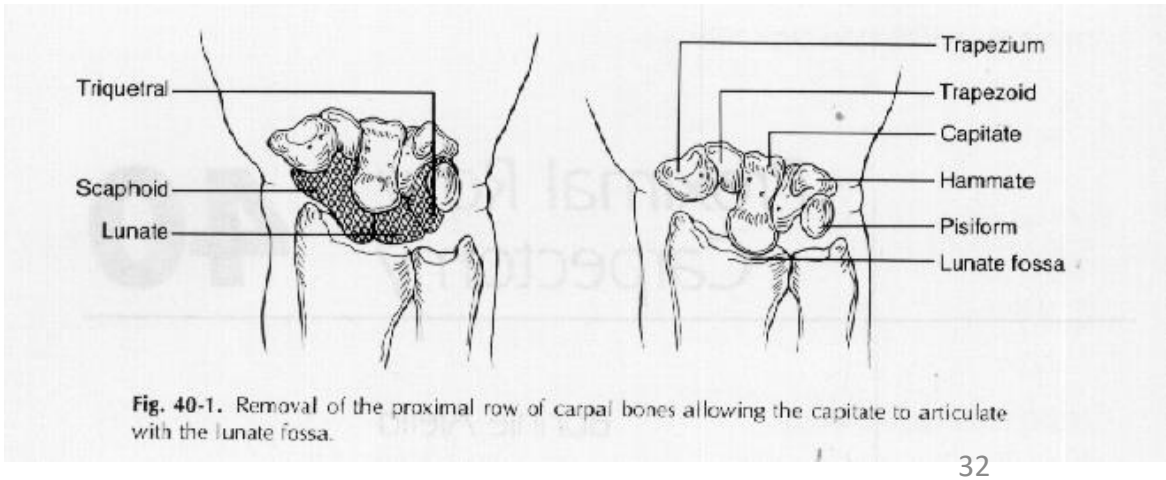


Fig. 40-1. Removal of the proximal row of carpal bones allowing the capitate to articulate with the lunate fossa.

Practice

- Draw the 8 thenar muscles and 1st dorsal interosseous
- Palpate trapezium and the STT joint
- Conduct CMC grind test
- Test stability of volar and dorsal CMC ligaments
- Test stability of MCPJ with and without load

https://handlab.com/resources/drawing-thumb-muscles/

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