Best Practices in Forearm & Hand Injuries

Andrew Stein, M.D., Drew Terrono, M.D., Herve Kimball, M.D., Taylor Horst, M.D. Julianna Hardy, Colleen Medlin PT, Nancy Segreve, MA, CRC, CCM

De Quervain's Tendinopathy

Taylor A. Horst, MD

Hand & Upper Extremity Surgeon

Excel Orthopaedic Specialists

200 Unicorn Park Dr
Woburn, MA 01801
(781) 782-1330

Disclosures

- none

Goals

- The active listener should be able to
  - Identify de Quervain tendinopathy symptoms
  - Identify patient population most at risk for de Quervain tendinopathy
  - Discuss the nonsurgical treatment options available and their affect
  - Understand the surgical option available, goals of surgery and the results

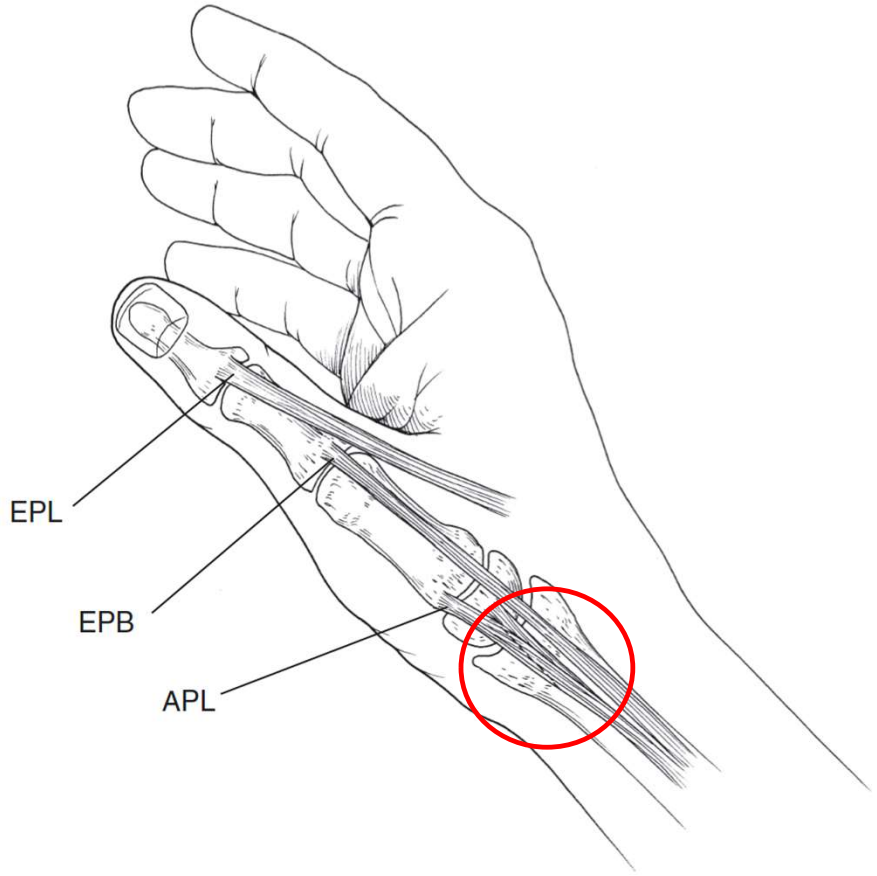
De Quervain Tendinopathy

- First described in 1895 by Fritz de Quervain
- Harry Finkelstein further described in 1930 identifying a detailed physical examination test
- Daniel Patterson first called it

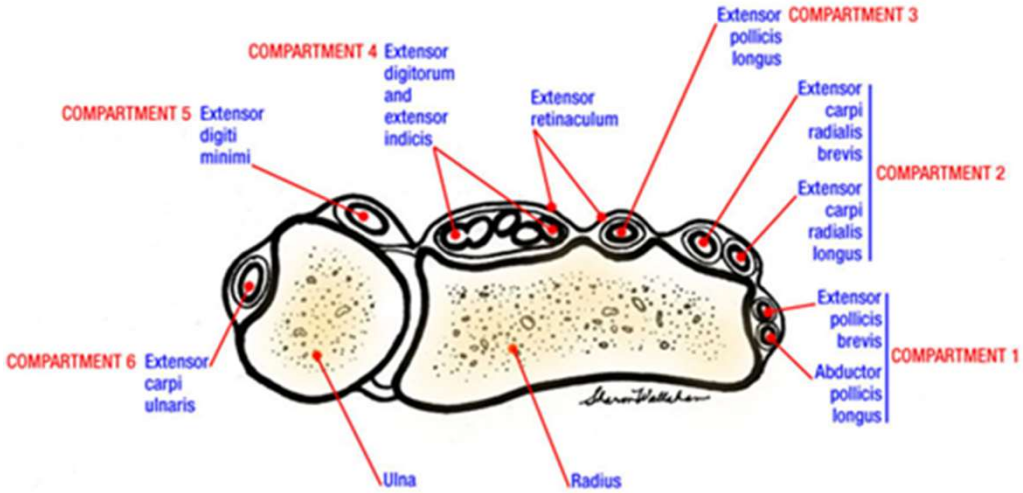
  de Quervain disease in 1936

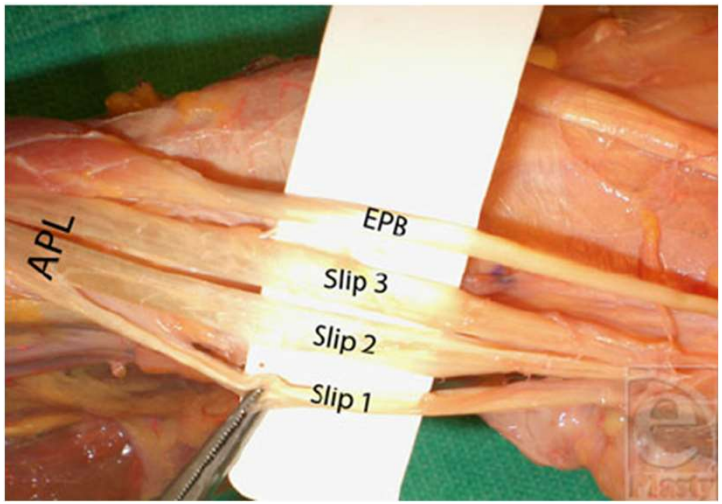
Pathology/Pathophysiology

- Originally thought to be inflammation around the tendon
  - Stenosing tenosynovitis
  - Peritendinitis
  - Styloid tenovaginitis
  - Stenosing tendovaginitis
- Later found to be attritional and degenerative


EPL
EPB
APL

Anatomy Variations





Variations in anatomy have included

- Multiple slips of APL and occasional EPB
- Division of the 1st dorsal compartment by additional septum

Potential predisposing factors

- Historically from overexertion from household duties
- Repetitive motions
- New mother's
  - Lower cribs
  - Older mothers
  - Heavier children
  - Frequent smartphone scrolling
- Debate on association of DeQuervain's and work related factors

SCIENTIFIC ARTICLE

Incidence of de Quervain's Tenosynovitis in a Young, Active Population

Jennifer Moriatis Wolf, MD, Rodney X. Sturdivant, PhD, Brett D. Owens, MD

- J Hand Surg 2009
- 11,332 cases of de Quervain's in military patients
- **Gender:** Women had significantly higher rate
  - 2.8 cases per 1000 person-years compared to men at 0.6
- **Age:** greater than 40 sig risk factor
  - 2.0 per 1000 person-years
- **Race:** Blacks higher incidence at 1.3 per 1000 person-years

TABLE 1. Unadjusted and Adjusted Incidence Rates and Rate Ratios of de Quervain's Tenosynovitis by Gender Among U.S. Service Members Between 1998 and 2006

			Unadjusted		Adjusted	
Gender	Injuries	Person-Years	Rate	Rate Ratio (95% CI)	Rate	Rate Ratio (95% CI)
Male	6,376	10,351,762	0.6159	n/a	0.5350	n/a
Female	4,956	1,765,987	2.8064	4.5563 (4.3902, 4.7285)	2.3799	4.4487 (4.2810, 4.6231)

Rate per 1000 person-years; male referent category; adjusted for race, age, service, rank.

TABLE 2. Unadjusted and Adjusted Incidence Rates and Rate Ratios of de Quervain's Tenosynovitis by Race Among United States Service Members Between 1998 and 2006

			Unadjusted		Adjusted	
Race	Injuries	Person-Years	Rate	Rate Ratio (95% CI)	Rate	Rate Ratio (95% CI)
Black	3,168	2,417,075	1.3107	1.6080 (1.5418, 1.6770)	1.1975	1.3099 (1.2056, 1.4231)
Other	1,226	1,188,909	1.0312	1.2651 (1.1906, 1.3443)	1.1869	1.1744 (1.1047, 1.2484)
White	6,938	8,511,765	0.8151	n/a	1.0107	n/a

Rate per 1000 person-years; white referent category; adjusted for gender, age, service, rank.

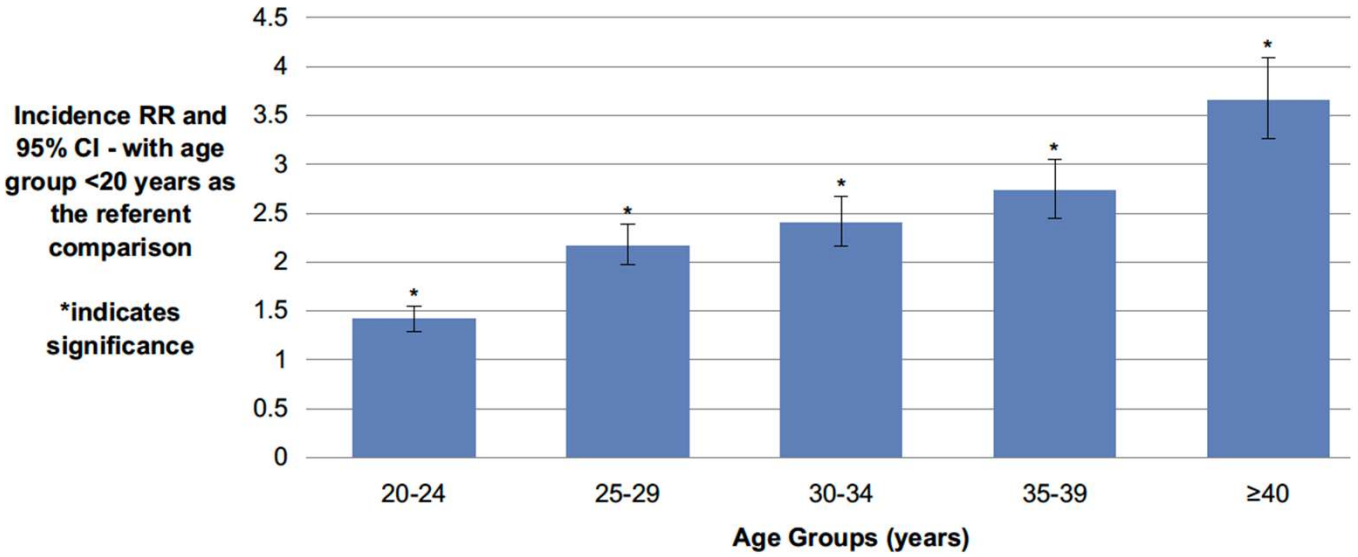


FIGURE 1: Incidence rate ratio and 95% confidence intervals by age group.

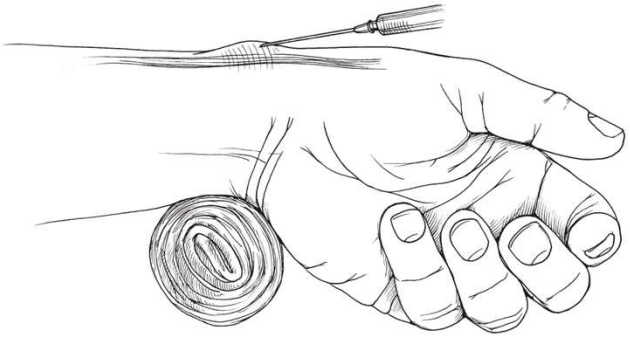
Presentation

- Gradual onset of pain localized along the radial side of the wrist
- Often experience an exacerbation of symptoms caused by grasping and raising objects with wrist in neutral rotation

Diagnosis

Nonsurgical Treatment

- Should be 1st course of action
  - Rest
  - Splinting
  - NSAIDS
  - Corticosteroid injections
- ~80% have been found to have resolution of symptoms within 1 year of onset



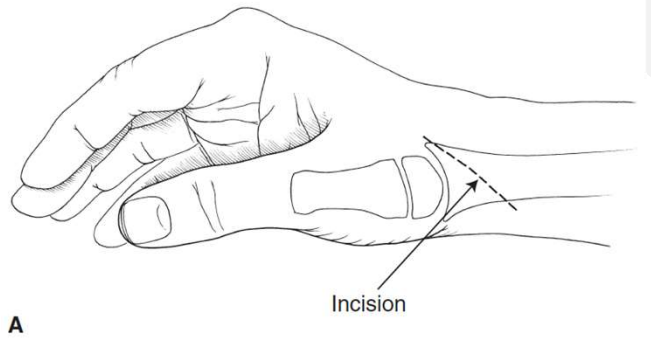
Corticosteroid Injection With or Without Thumb Spica Cast for de Quervain Tenosynovitis

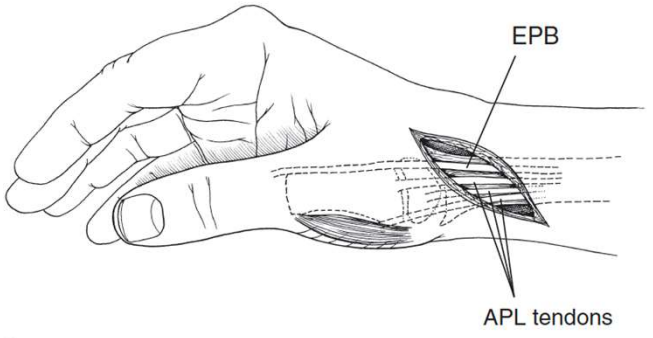
Mohsen Mardani-Kivi, MD, Mahmoud Karimi Mobarakeh, MD, Farzaneh Bahrami, MD, Kevyan Hashemi-Motlagh, MD, Khashayar Saheb-Ekhtiari, MD, Niloofar Akhoondzadeh, MD

- J Hand Surg 2014
- 67 patients randomized to corticosteroid alone or thumb spica cast + coricosteroid injection
- Treatment success = absence of radial sided wrist pain and negative Finkelstein test
- Following 3 weeks of treatment
- 93% treatment success rate in the casting + steroid group
- 69% treatment success in the corticosteroid group

Surgical Intervention

- Typically after >6 mo of failed non-operative intervention
- Psychiatric illness and Medicaid insurance have been associated with undergoing surgery[1]
- Anatomy a factor
- Fundamentals
  - Protect sensory radial nerve
  - Fully release the first dorsal compartment
    - Including any sub-compartments
- Success rate ≥ 91%





Satisfaction

- Patients with longer symptoms (9 mo of longer) typically more satisfied
- Most (>80%) tend to be satisfied even with persistent symptoms for > 3 mo such as
  - Wrist pain
  - Scar tenderness
  - Numbness and tingling at surgical site
  - Restricted range of motion

Conclusion

- De Quervain's tendinopathy is a mucoid degenerative process exacerbated by motion
- Occurs in about 1%-2% of all active young adults
- Women, patients greater than 40 and non-white population with higher incidence
- Varying opinions as to optimal treatment
- Nonsurgical intervention with combination of splinting/casting/steroid injections helpful
- Surgical intervention available
  - Usually necessary in patients with separate subsheath of EPB of multiple APL tendon slips

2023

Work Related Injuries Workshop

Scapholunate Ligament Injuries

Hervey L. Kimball MD

Boston Sports & Shoulder Center

New England Baptist Hospital

Boston Sports & Shoulder Center
BSSC
THE HAND CENTER

Beth Israel Lahey Health
New England Baptist Hospital

CELTICS
OFFICIAL HOSPITAL

Clinical Case

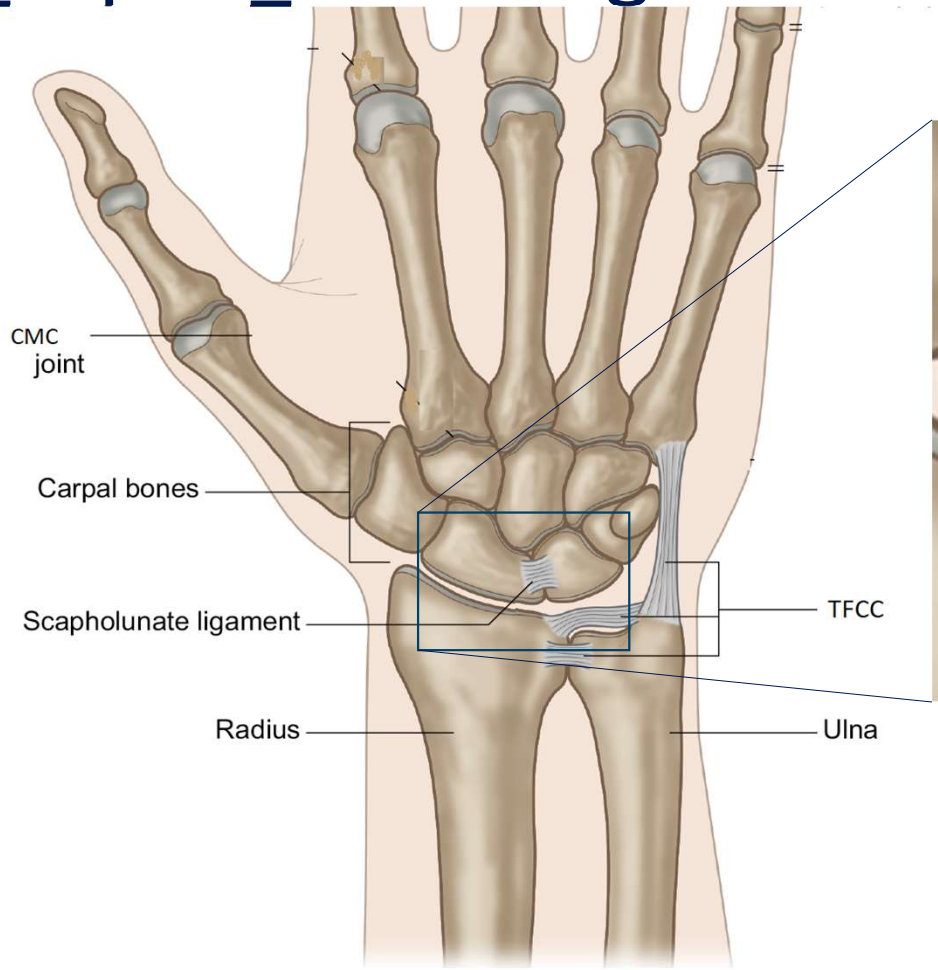
35 year old laborer

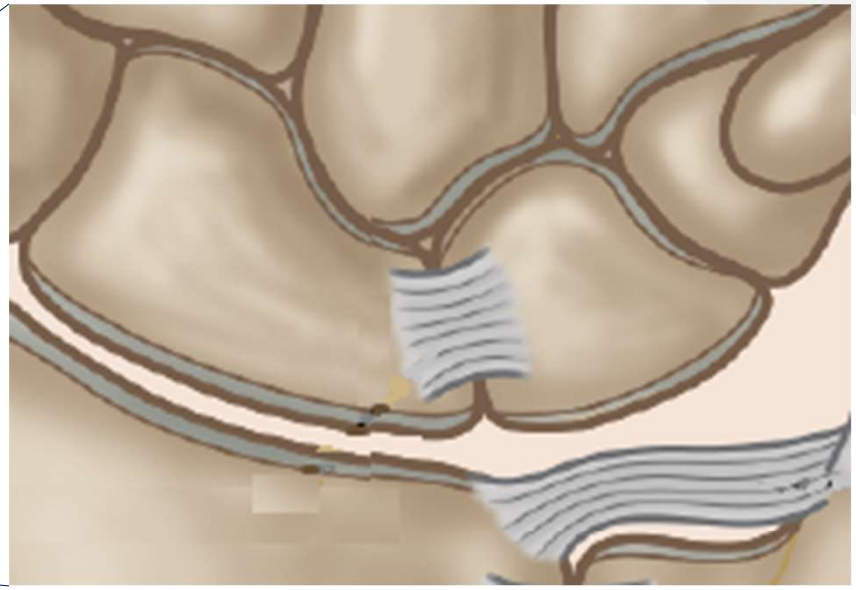
- Fall on wrist 6 months prior
  - Re-injury with sledge hammer
- Complaint:
  - Wrist pain with use
  - Weakness and clicking
- Treatment: splint short term & NSAIDs

Clinical Case

Wrist Radiographs

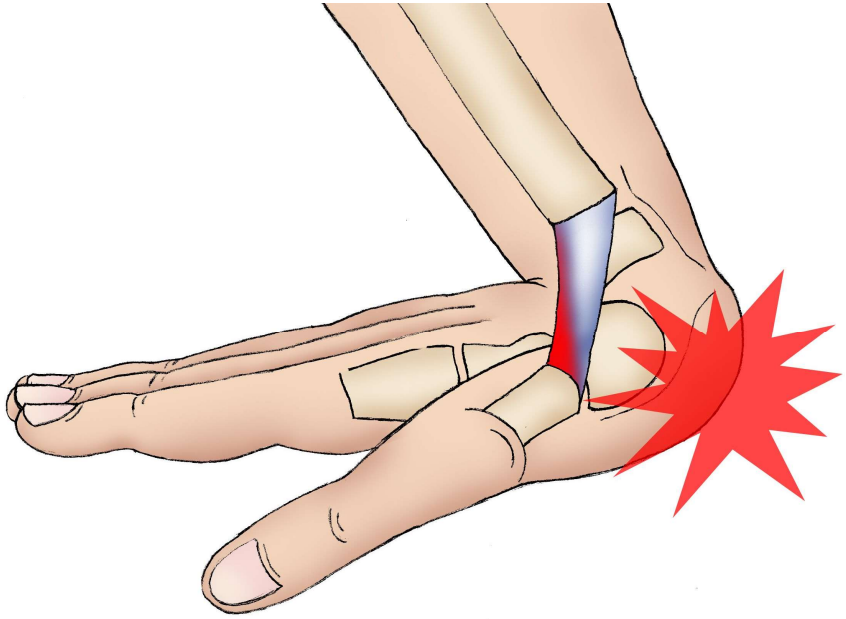
ScaphoLunate Ligament (SL)





Incidence & Etiology

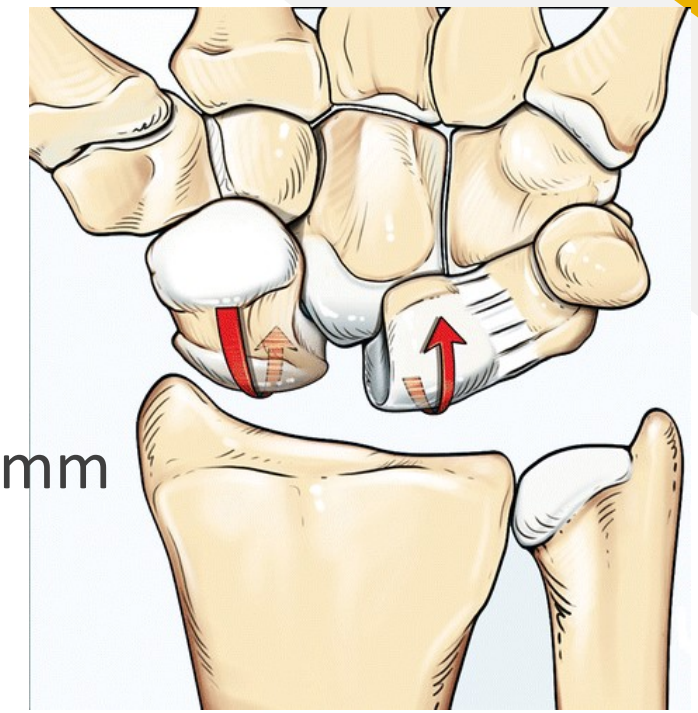
- Impact force to wrist
- Fall : wrist extension, ulnar deviation & carpal supination



Boston Sports & Shoulder Center
THE HAND CENTER

Pathoanatomy SL Instability

- Scaphoid Lunate Dissociation
- Rotation
  - Scaphoid flexion and lunate extension
- Diastasis
  - Gap between scaphoid and lunate > 3.0 mm
  - Associated capsular injury



Boston Sports & Shoulder Center
THE HAND CENTER

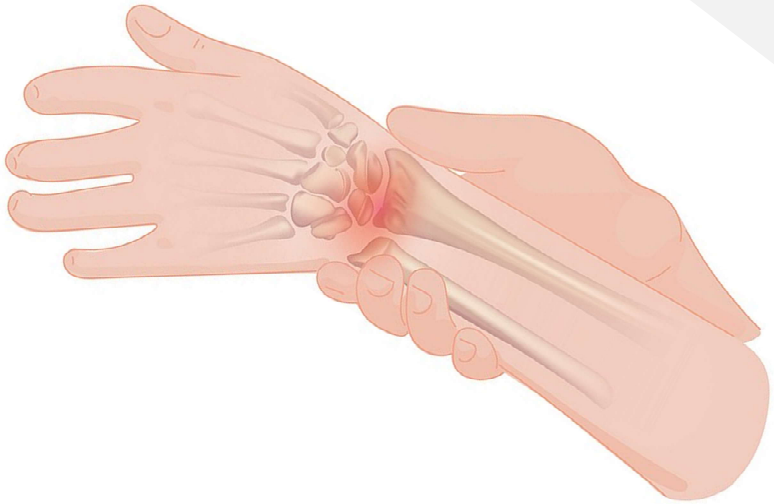
Acute vs. Degenerative SL Tears

Considerations:

- Mechanism of injury
- Duration from injury
- Age
- Level of activity
- Underlying arthritis : *GOUT*

Symptoms

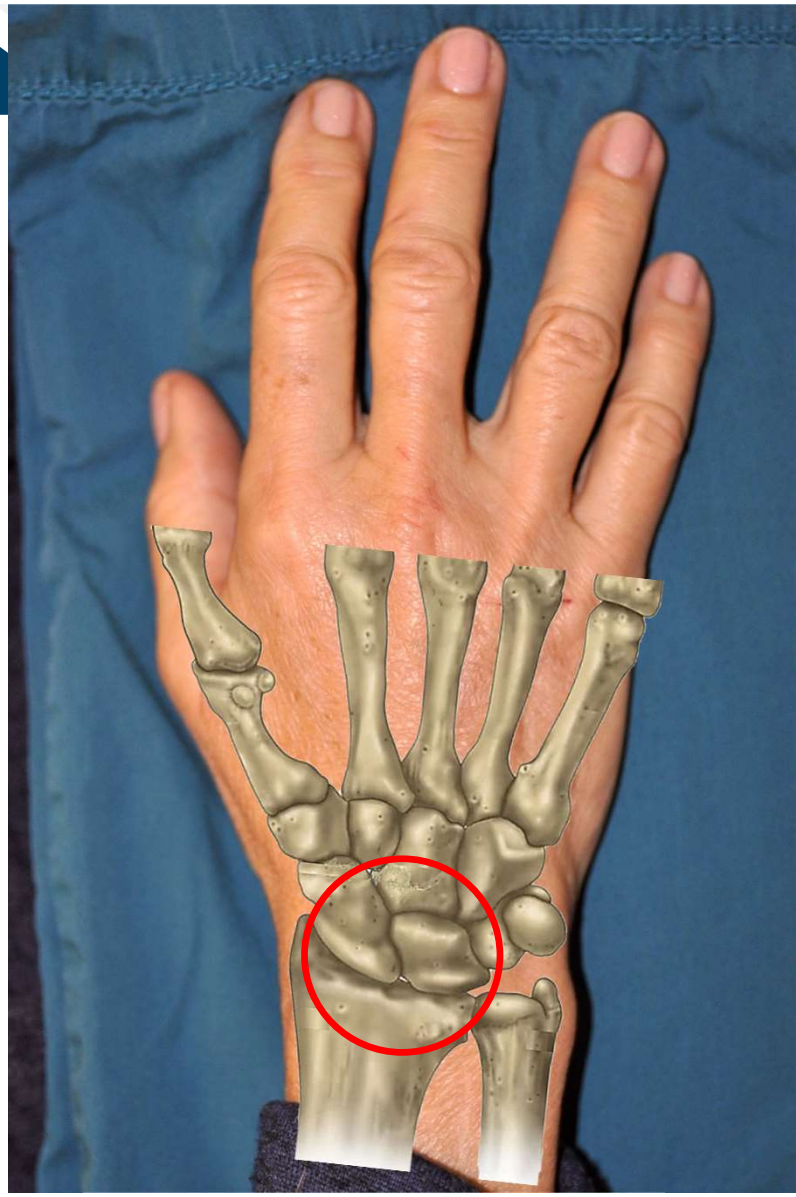
- Dorsal & radial wrist pain
- Clicking or catching of wrist



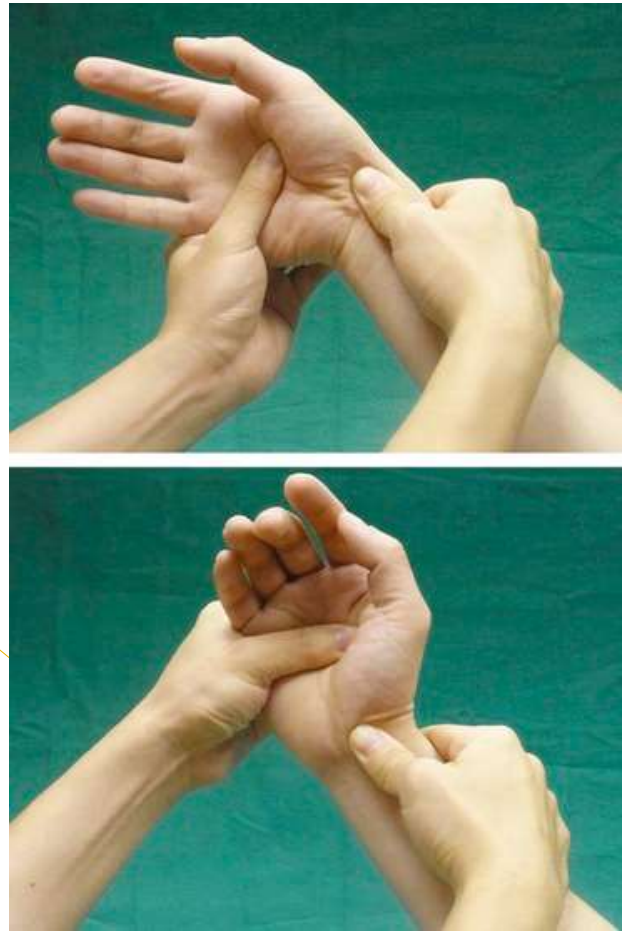
Boston Sports & Shoulder Center
THE HAND CENTER

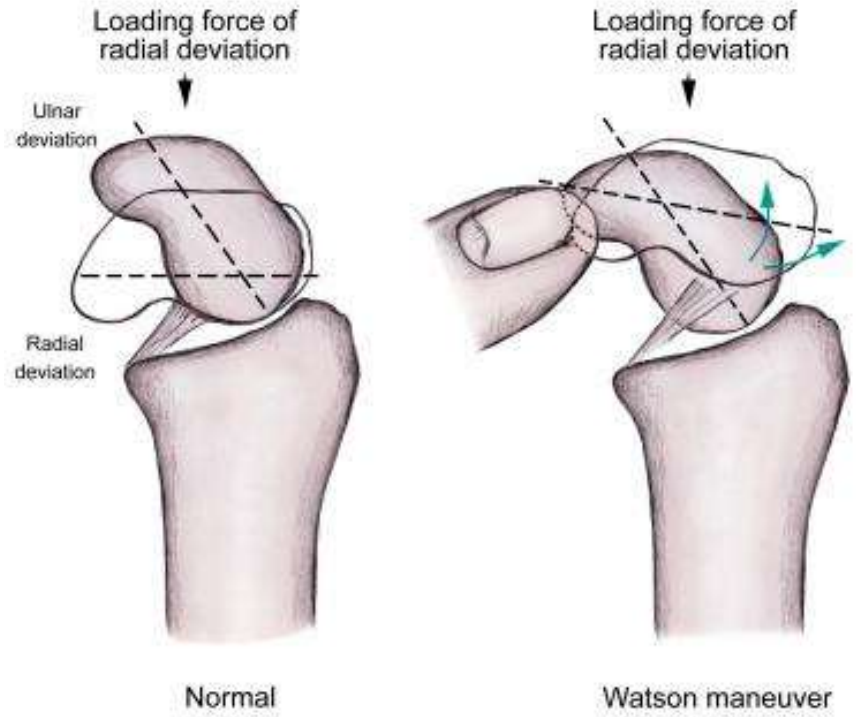
Examination

- Tenderness over SL
- Painful at end ranges
- Watson Test : Scaphoid shift test



Scaphoid Shift Test : Watson





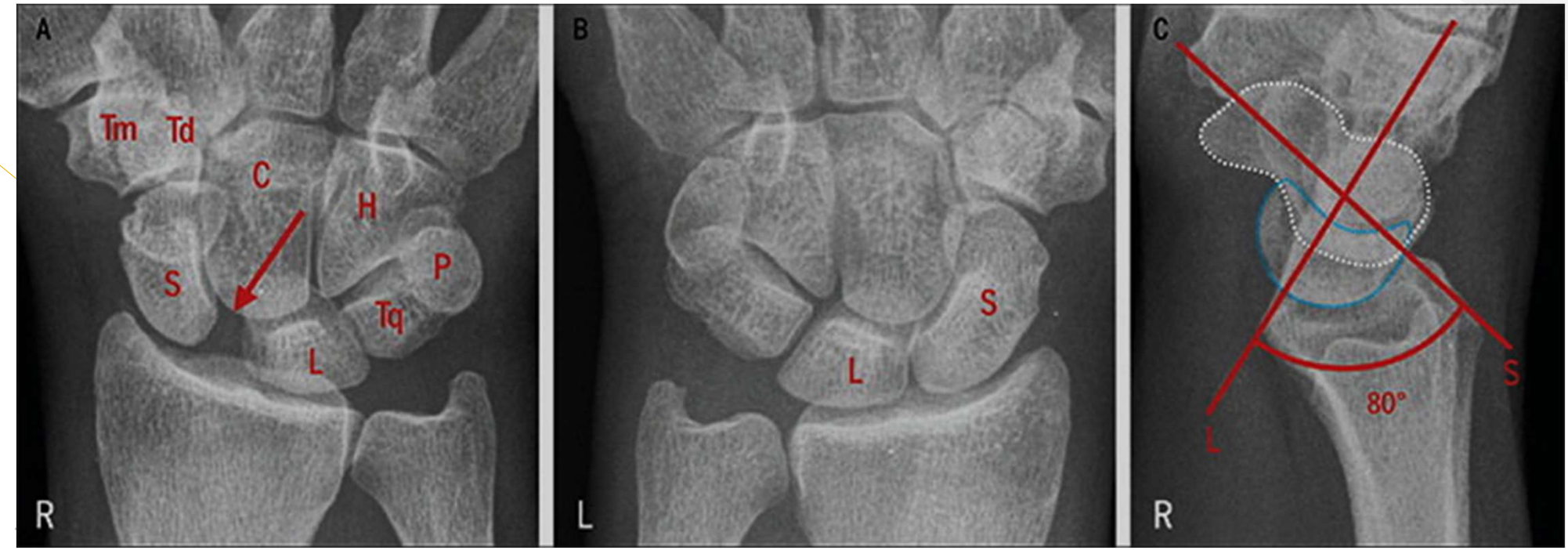
Normal

Watson maneuver

Boston Sports & Shoulder Center
THE HAND CENTER

Imaging : Radiographs

- SL gap > 3.0 mm
- Cortical Ring sign
- Increased SL angle >70^{o}



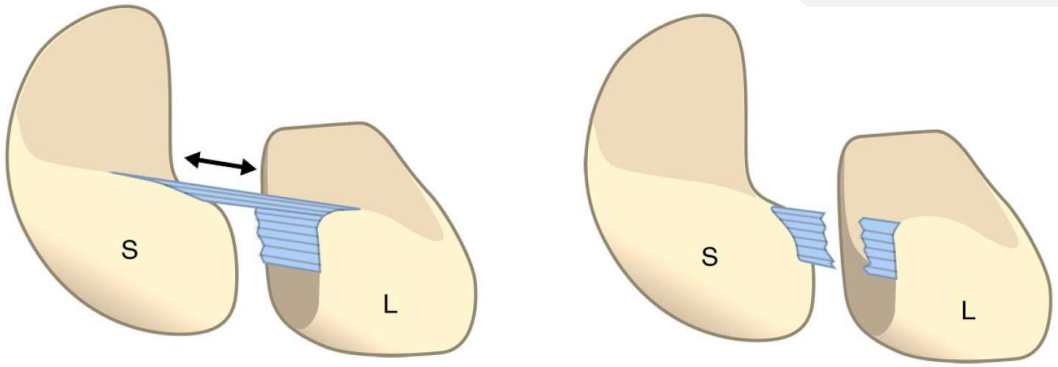
Imaging

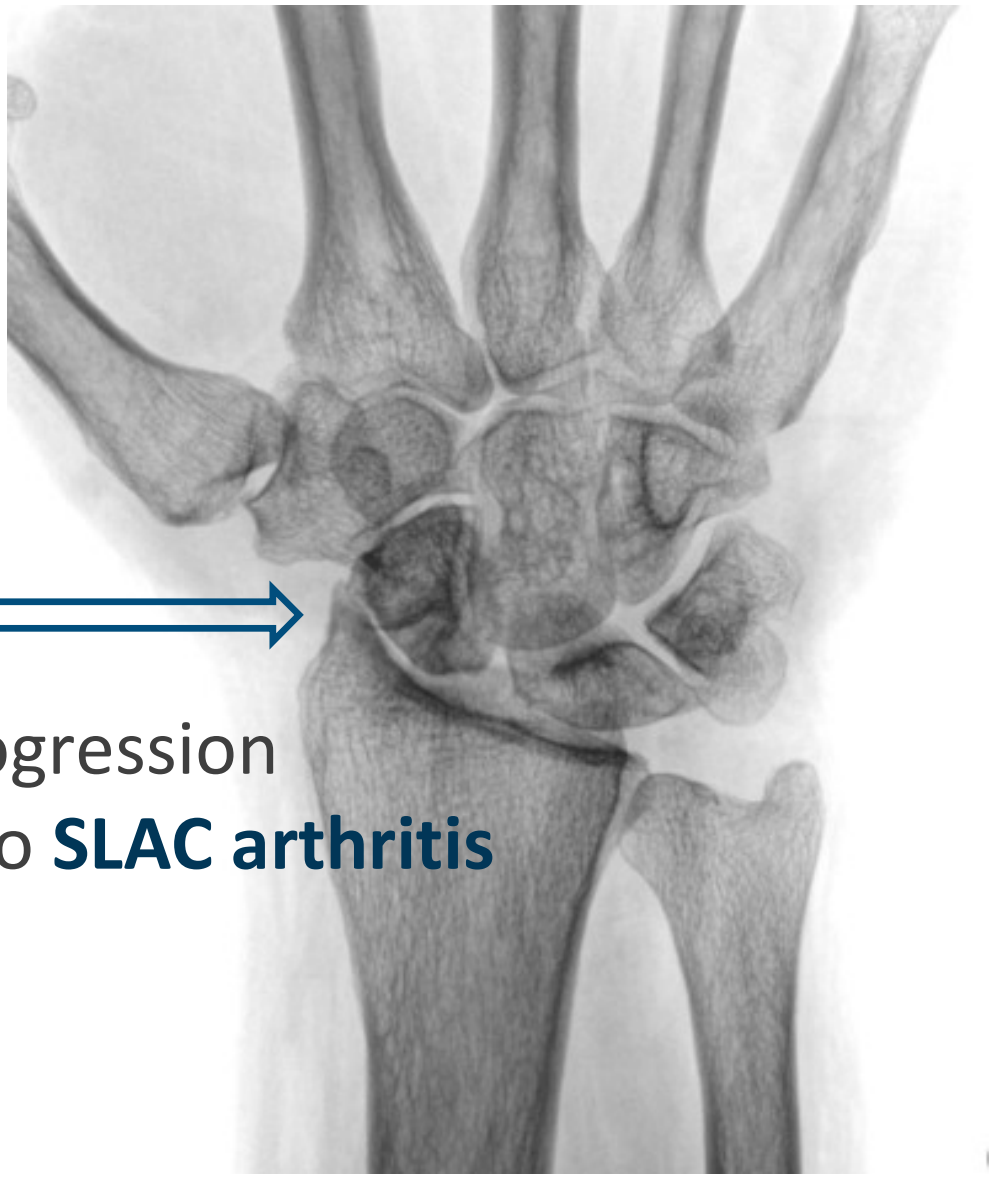
- MRI
  - Over used for screening
  - Low sensitivity
  - Improves with arthrography

Stages SL Instability

- Predynamic
- Dynamic
- Static
- Arthritis : SLAC

  ScaphoLunate Advanced Collapse





4 Years progression
to **SLAC arthritis**

Nonoperative Treatment

- Immobilization
  - Acute without carpal malalignment
  - Chronic tear
    - Age
    - Activity
    - Arthritis
  - Questionable efficacy

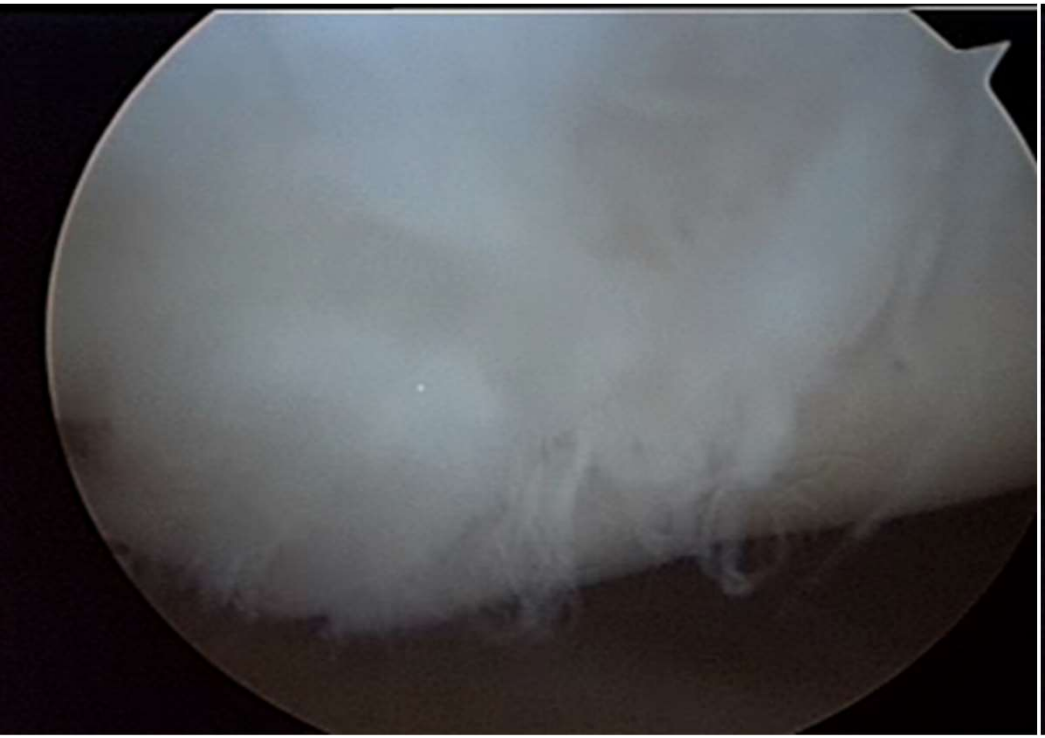
Boston Sports & Shoulder Center
THE HAND CENTER

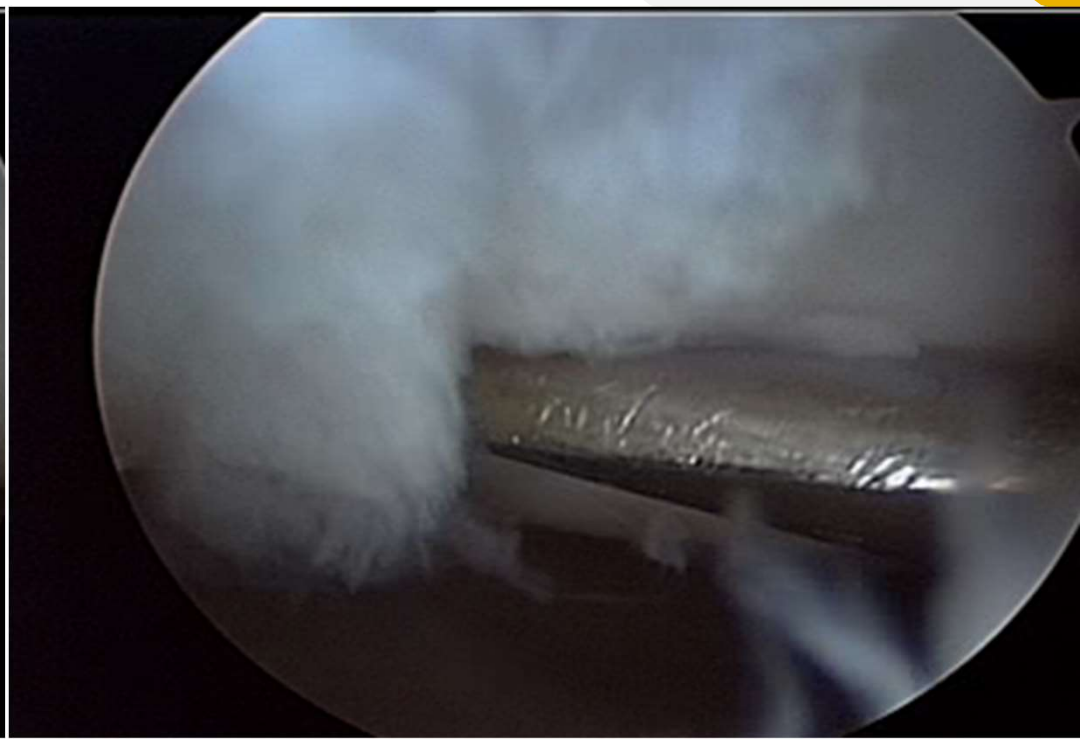
Operative Management

- Scapholunate Ligament Repair
- Reconstruction of Ligament
- Fusion of carpal bones

- Wrist Arthroscopy may be considered for diagnosis

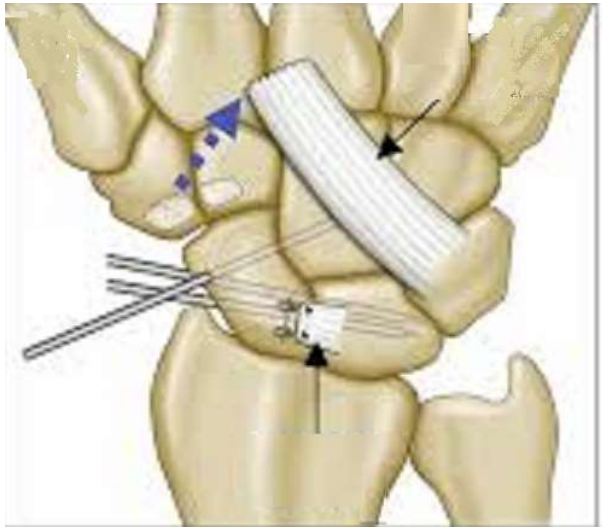
Wrist Arthroscopy

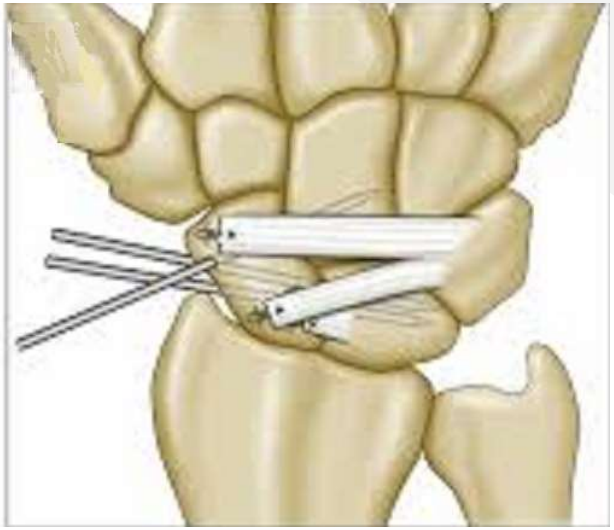




Scapholunate Repair & Reconstruction

Arthrex Internal Brace





Dorsal Ligament Augmentation

Boston Sports & Shoulder Center
THE HAND CENTER

RASL or Carpal Fusion

Reduction Association Scaphoid Lunate: RASL

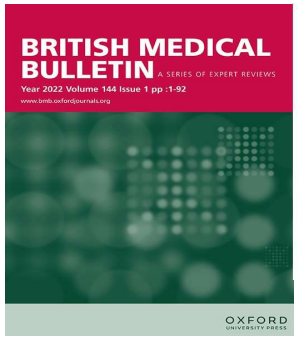
Carpal STT Fusion

Boston Sports & Shoulder Center
THE HAND CENTER

Clinical Case: 35 yo Laborer

Post-Operative Care

- Cast 6-12 weeks
- Pin Removal
- Therapy
  - ROM
  - Strengthening @ 2-3 months
  - Work simulation



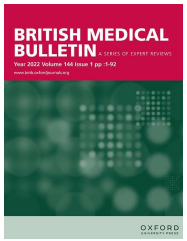
Return to sport or work following surgical management of scapholunate ligament injury: a systematic review

Mei Yen Liew[2], Lewis A. Dingle[3], Abi Semple[1], and Philippa A. Rust[1,2,*]

- 14 studies with 6 different surgical interventions
- All surgical techniques demonstrated >80% RTW/S
- Optimal surgical intervention undetermined

October 2022 Study

Boston Sports & Shoulder Center
THE HAND CENTER



Return to sport/work following surgery for SLL injury, 2022

Table 4 Summary of the primary and secondary outcomes following surgical management of isolated SLL injury

Type of surgical intervention	$N^{(Total)}$	Rate of return to sport/work/activity	Rate of return to pre-injury level of sport/work/activity
Open repair[25,28,32,33]	87	74/87 (85.1%)[25,28,32,33]	70/74 (94.6%)[25,28,32,33]
Dorsal capsulodesis[25,27,28,31,32]	100	82/100 (82.0%)[25,27,28,31,32]	70/71 (98.6%)[25,27,28,32]
Ligament reconstruction[27,29,34–38]	130	109/130 (83.8%)[27,29,34–38]	94/109 (86.2%)[27,29,34–38]
Arthroscopic soft tissue treatment[30]	14	12/14 (85.7%)[30]	12/12 (100.0%)[30]
Bone–ligament–bone graft[31,33]	31	29/31 (93.5%)[31,33]	15/18 (83.3%)[33]
Scapholunate joint stabilization via tenodesis combined with fusion through metalwork[26]	11	11/11 (100.0%)[26]	11/11 (100.0%)[26]

Beth Israel Lahey Health
New England Baptist Hospital

Thumb CMC Arthrosis

Andrew L. Terrono, MD
New England Baptist Hospital
Tufts University Combined Hand Service

The Hand Center
BSSC
Boston Sports & Shoulder Center

Beth Israel Lahey Health
New England Baptist Hospital

CELTICS
OFFICIAL HOSPITAL

Tufts
School of Medicine

Thumb CMC Arthrosis

- Post- traumatic- Uncommon
  - Post IA Fracture
  - CMC Dislocation
- Inflammatory i.e. RA
- **Osteoarthritis**- Most Common
  - Familial

Thumb CMC Osteoarthrosis

- Women > men
- “Middle aged”

Associated

Trigger digit

CTS

Thumb CMC Osteoarthrosis

- Definition- Loss of articular cartilage
- Incidence MD treated
  - Women 1.4%, Men .62
  - Presenting Age
    - Women 60-69
    - Men 70-79
  - Peak incidence
    - Woman 70-74
    - Men 80-84
  - Age mean 68

The Hand Center
BSSC Boston Sports & Shoulder Center

Wolf JM et al Arthritis Care Res 2014

Thumb CMC Arthrosis
Basal Joint Arthritis Diagnosis

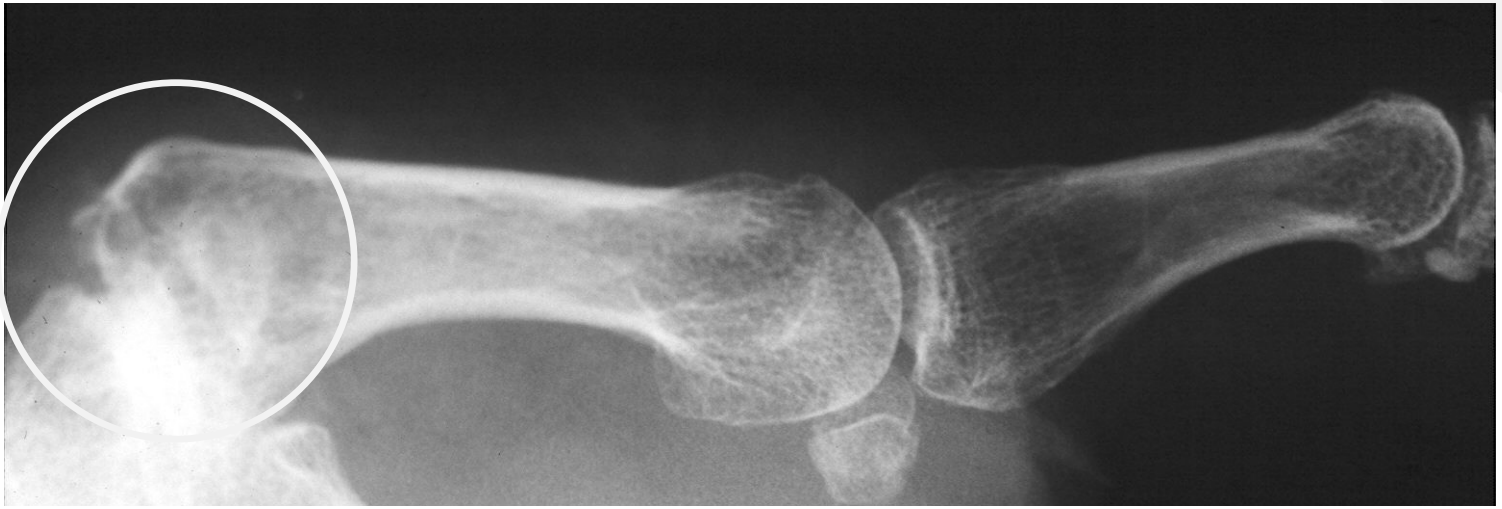
- Symptoms
  - Pain/tenderness/deformity base of thumb
  - Painful pinch/grasp (key, wash cloth)
  - Loss dexterity
  - Impaired strength
  - Limited/painful/crepitant thumb motion

Thumb CMC Arthrosis

Physical Exam

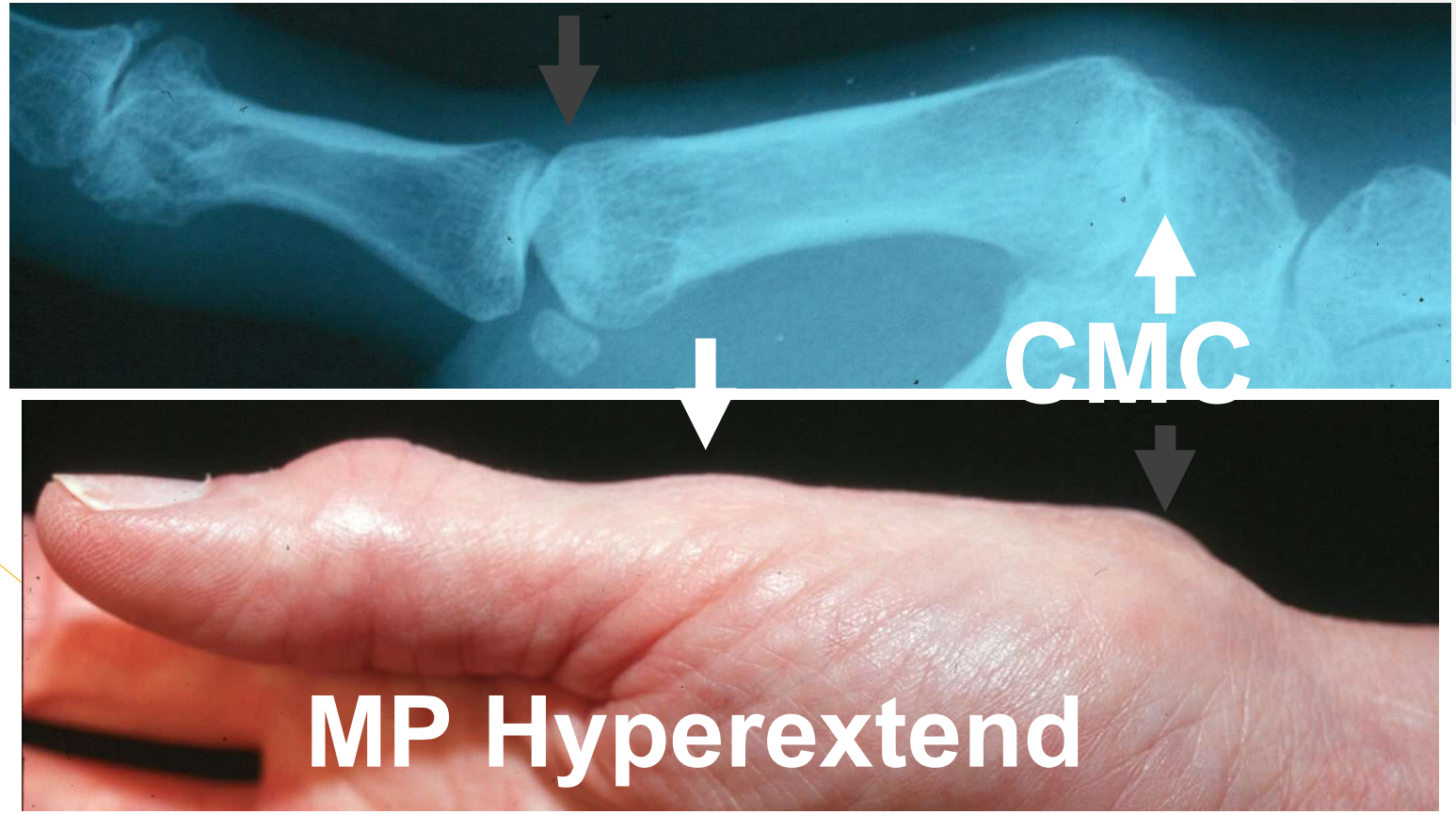
- Deformity
- Synovitis
- Subluxation
- Instability
- Painful grind at CMC joint
- ↓ Pinch strength

Thumb CMC Arthrosis



- X-ray confirms
- R/o other causes

Thumb CMC Osteoarthrosis



Thumb CMC Arthrosis

- If non-tender

Look for other cause

Thumb CMC Arthrosis

Treatment

- Rest
- Joint protection
- Assistive devices
- NSAI
- Splint
- Hand therapy
- Injection
- Surgery

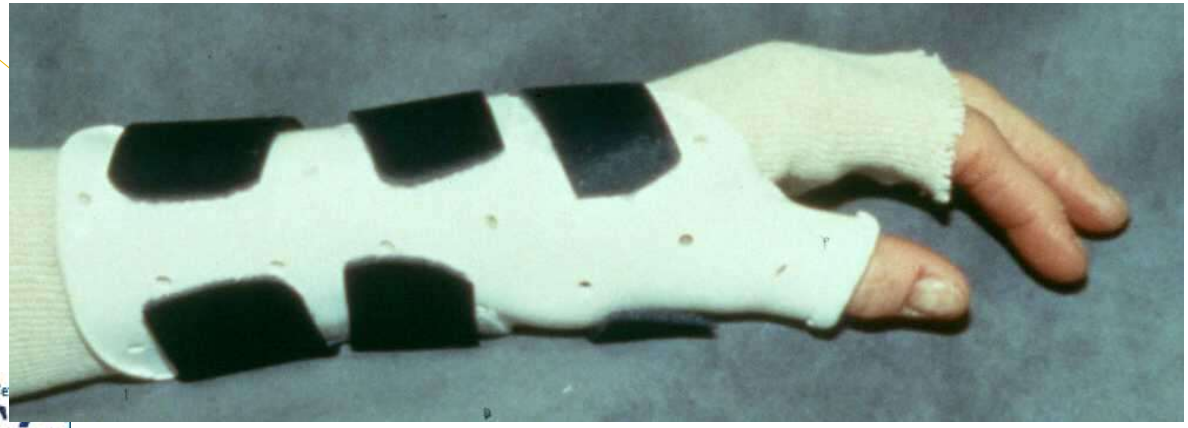
Thumb CMC Arthrosis
Non-Operative Treatment

- Prefab splint

Thumb CMC Arthrosis
Non-Operative Treatment

Splinting

← Hand Based



Long opponens

Thumb CMC Arthrosis Surgery

Indications

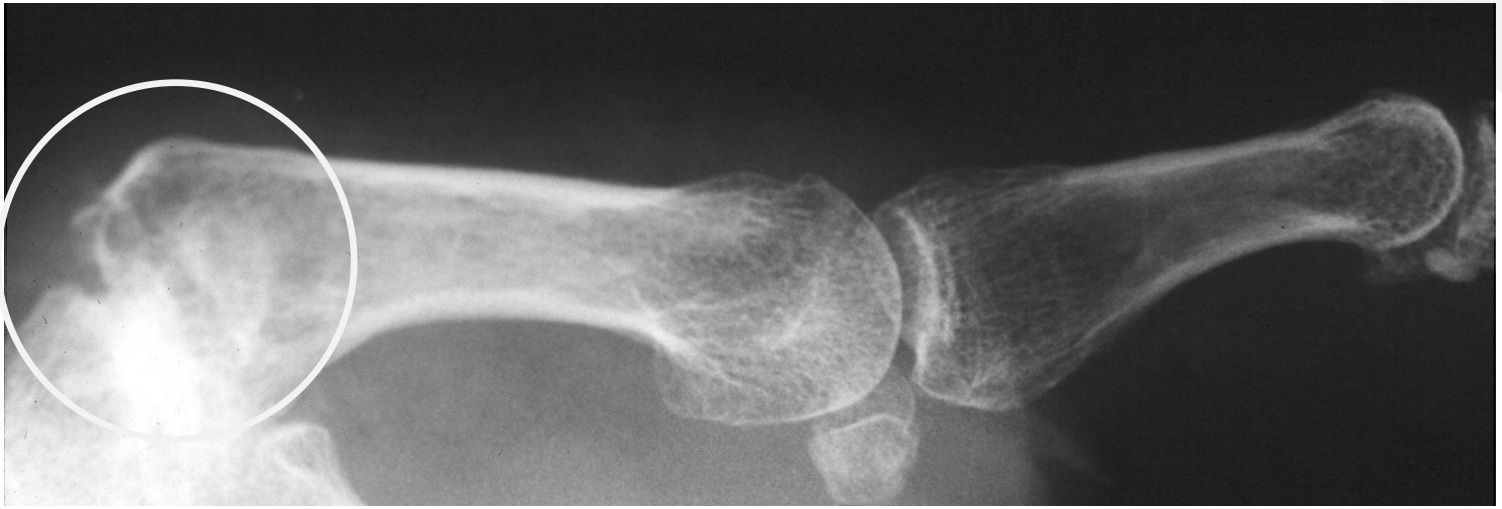
- Failure of non-op treatment
- Persistent **pain**, impairment
- Approximately 14% need surgery*

The Hand Center
BSSC Boston Sports & Shoulder Center

* Wurapa R, Uhl RL: ASSH 2000

Thumb CMC Arthrosis

Surgical Indications



- Radiographs consistent with CMC DJD

Thumb CMC Arthrosis Surgery

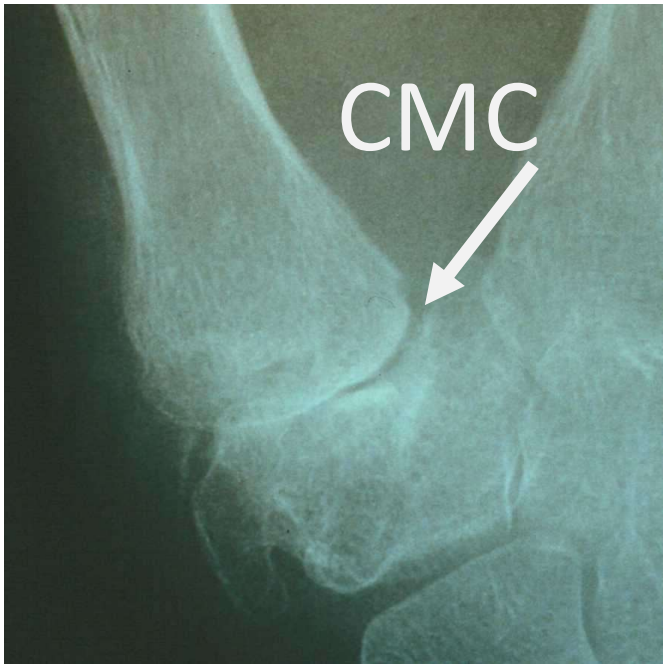
Contraindications

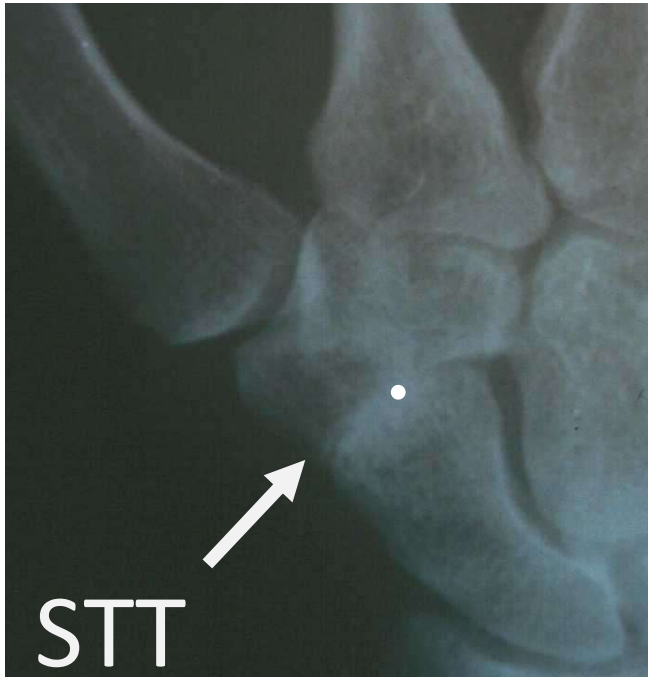
- Infection
- **No pain**
- No functional problems

Thumb CMC Arthrosis

Staging

With w/o STT





The Hand Center
BSSC
Boston Sports & Shoulder Center

Thumb CMC Arthrosis

Surgical Options

- Debridement- Arthroscopic/Tendon implant
- Extension osteotomy
- CMC Fusion
- **Trapezial resection arthroplasty**
  - With / without ligament reconstruction

The Hand Center
BSSC
Boston Sports & Shoulder Center

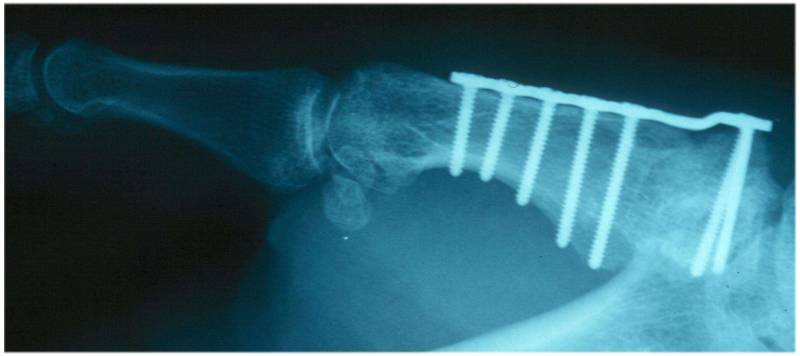
Thumb CMC Arthrosis

Surgical Options- Salvage

Arthroplasty

- With ligament reconstruction
- Most Common

Fusion



Good for young laborers
Ligament laxity

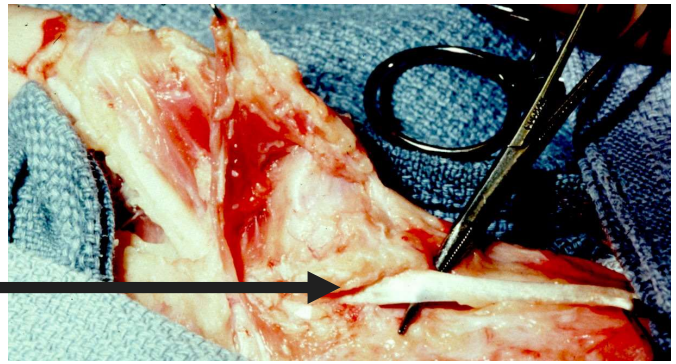
Thumb CMC Arthrosis
Surgical Options

Arthroplasty

Thumb CMC Arthrosis Surgery

Arthroplasty Options

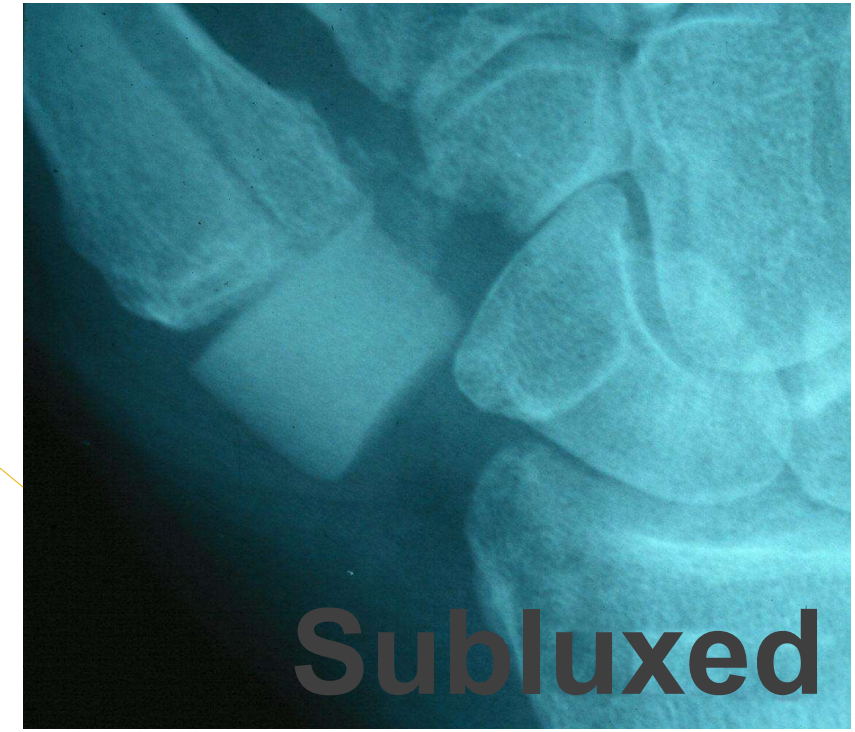
- Many options
- Gold standard still trapezium excision and ligament reconstruction



Thumb CMC Arthritis

Surgical Options

Trapezial Arthroplasty



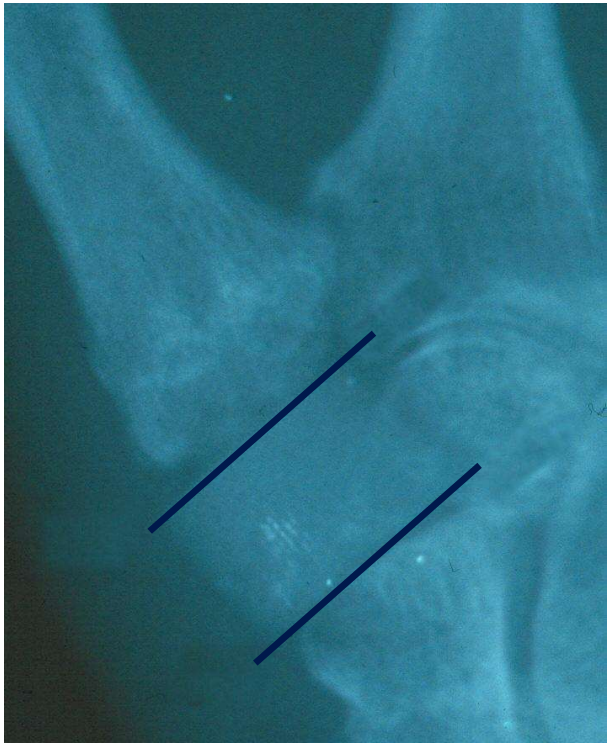
Deformed

The Hand Center
BSSC
Boston Sports & Shoulder Center

Thumb CMC Arthritis

Surgical Options

Trapezial Arthroplasty

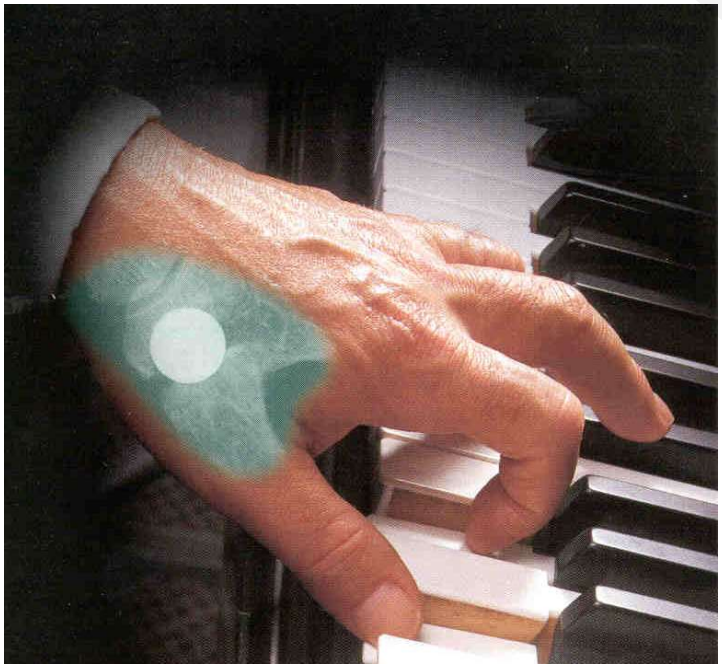


The Hand Center
BSSC
Boston Sports & Shoulder Center

Thumb CMC Arthrosis

CMC Arthroplasty

Orthosphere

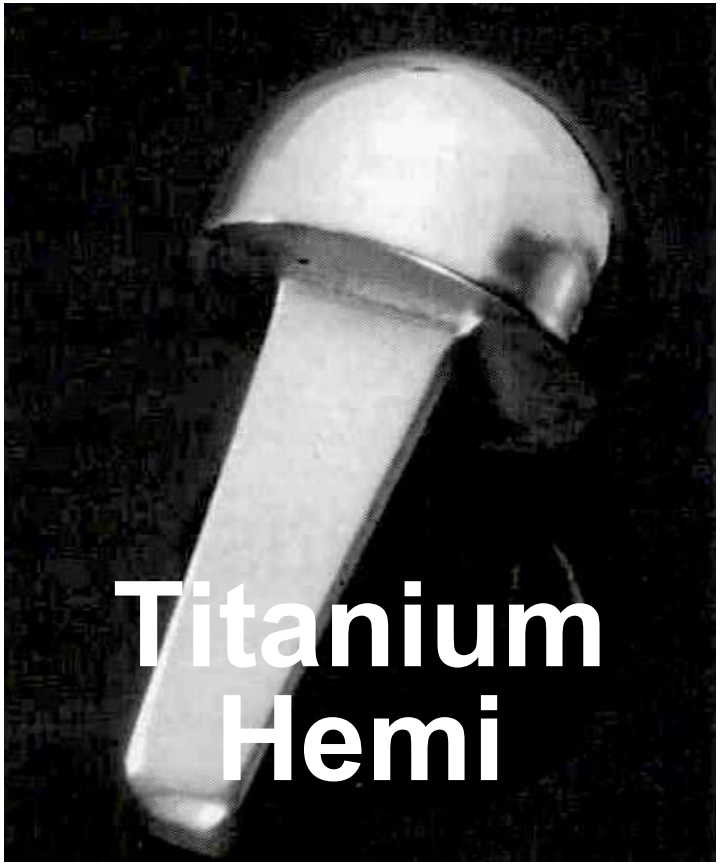


Failure

The Hand Center
BSSC
Boston Sports & Shoulder Center

Thumb CMC Arthrosis

CMC Arthroplasty



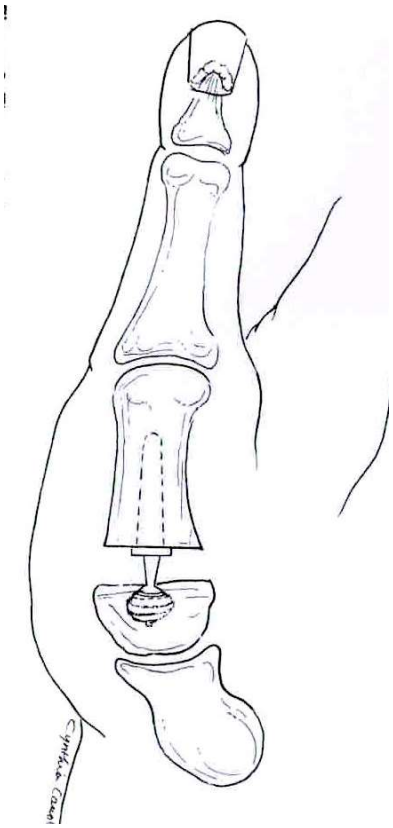
Thumb CMC Arthrosis

Implant Arthroplasty

Thumb CMC Arthrosis

Total Joint Implant Arthroplasty

2023
Work Related Injuries
Workshop



The Hand Center
BSSC
Boston Sports & Shoulder Center

Thumb CMC Resection Arthroplasty

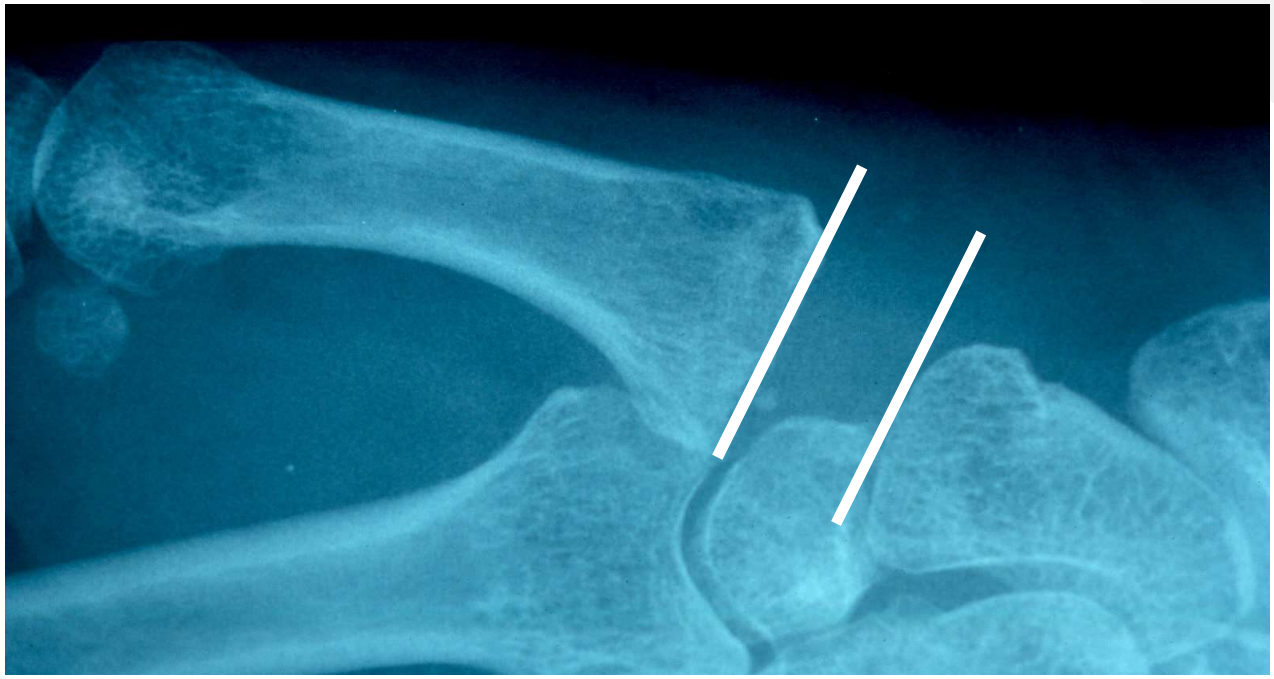
Results

- > 90% pain relief
- Good motion
  - Opposes usually to MP of small finger
- Strength good not normal
- May fatigue with repetitive pinch
- Uncommon need revision
  - Ligamentous laxity

Thumb CMC Resection Arthroplasty

Results- LRTI- Modified

Excellent space maintained at 5 yrs



Thumb CMC Arthrosis

The Hand Center
BSSC
Boston Sports & Shoulder Center

Beth Israel Lahey Health
New England Baptist Hospital

CELTICS
OFFICIAL HOSPITAL

Tufts
School of
Medicine

Case Discussion

Andrew B. Stein, M.D.
Boston University Medical Center

42M Laborer with Wrist Pain

- Fell on outstretched extremity at work site
- Denies prior injury/pain before injury
- Unable to RTW

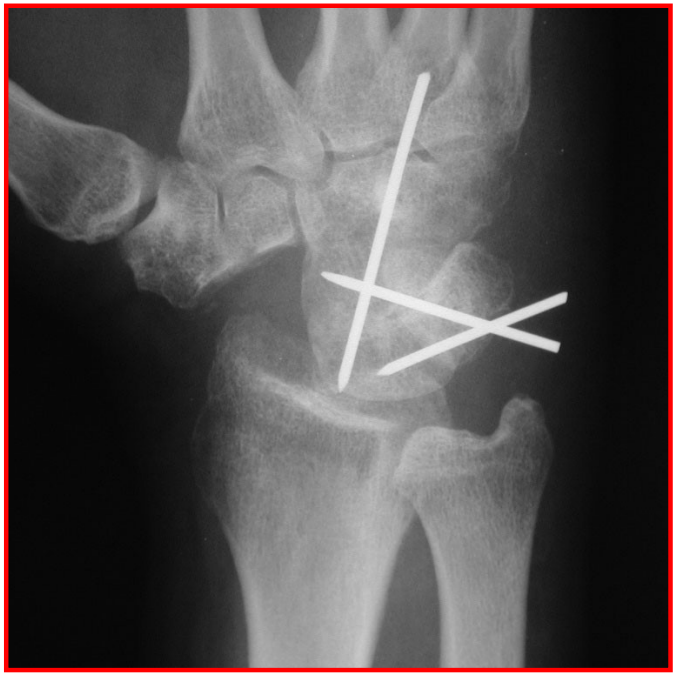
Natural History SLAC

- Untreated SL Dissociation → Αρτηριτισ (Πρεδιχταβλε Προγρεσσιον)
  1. Στψλοιδ αρτηριτισ
  2. Ραδιο–σχαπηοιδ αρτηριτισ
  3. Μιδχαρπαλ αρτηριτισ

*Radio-lunate joint preserved

Treatment Options

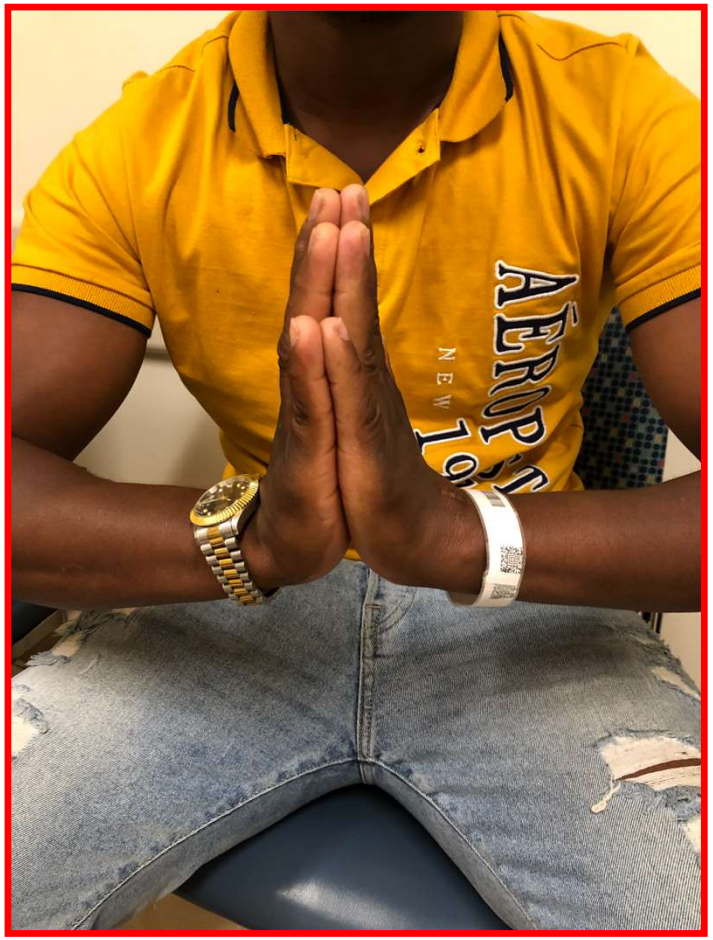
- Non-op:
  - Splint/NSAID/Cortisone Injection
- Wrist Denervation
- Motion Sparing Procedures:
  - Scaphoid excision and limited carpal fusion
  - Proximal Row Carpectomy
- Total Wrist Fusion

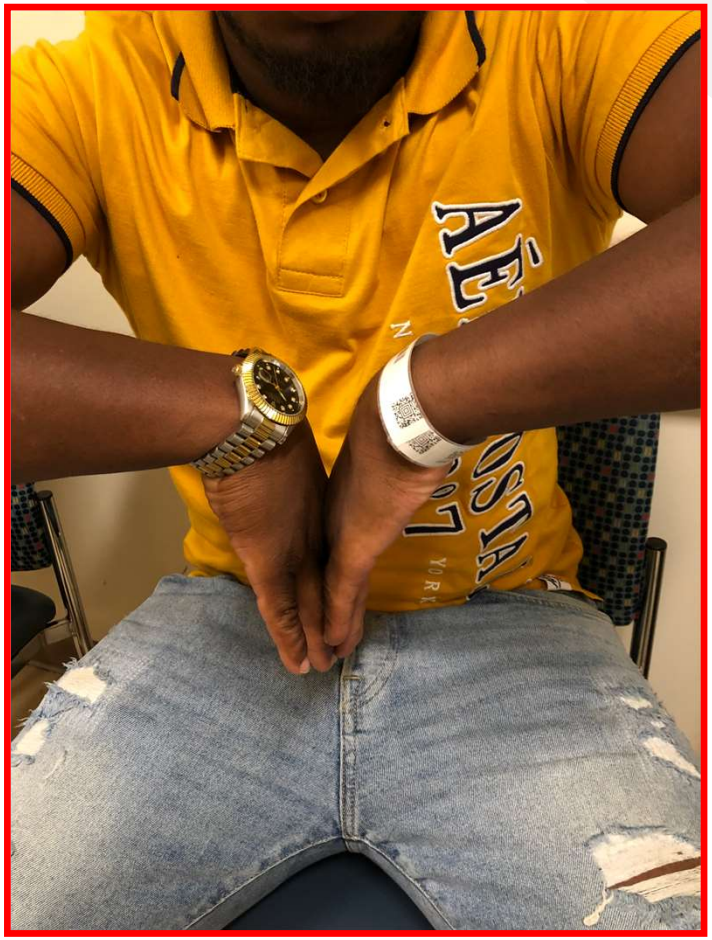


Motion Sparing Options

- Outcomes (ROM, grip) similar between PRC and partial fusions
- PRC (better?)
  - Simpler
  - No risk of non-union, hardware problems
  - Lower rate of conversion to total wrist fusion (4.9% vs. 19.2% - Chung *JHS* 2017)

6 mo s/p L PRC





Panel's Thoughts….

THANK YOU!