

**20th Singapore Society of Rheumatology –
Malaysian Society of Rheumatology
Preconference Workshop: Soft Tissue Rheumatism
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**General Approach to Hand and Wrist
Pathologies**



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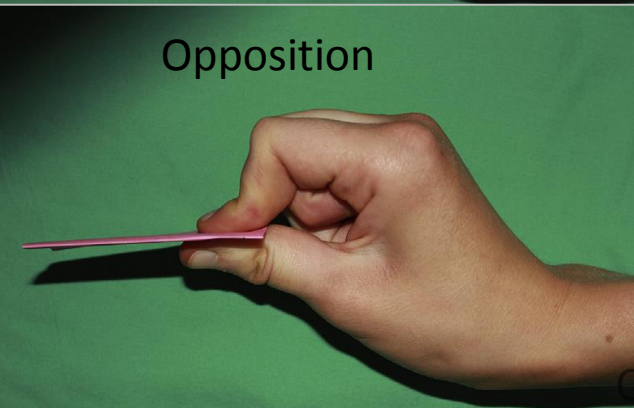
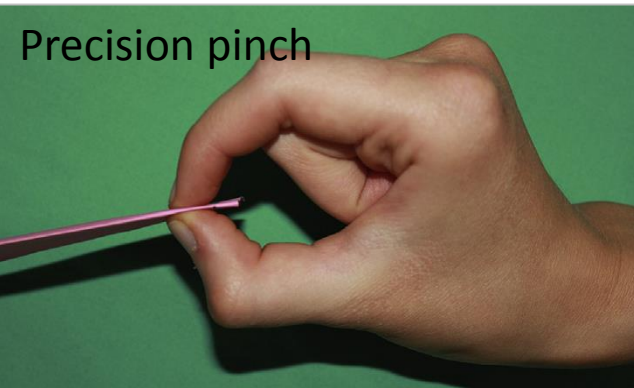


Outline

- Principles of assessment hand and wrist pathologies
- Examination of the hand and wrist - system
- Surface anatomy of ulnar and radial side wrist pathologies
- Specific wrist conditions
 - De Quervain's disease, ECU disorders, TFCC tears
- Specific hand conditions
 - CTS

Functions of the hand

- Complex organ; 7 maneuvers, senses
- Requirements: sensate and pain free digits, supple joints, free from deformity
- Stable wrist, opposable thumb and two or more digits



Outline

- The History Taking
 - The Clinical Examination
-

Majority of Hand and Wrist Disorders can be diagnosed by above steps

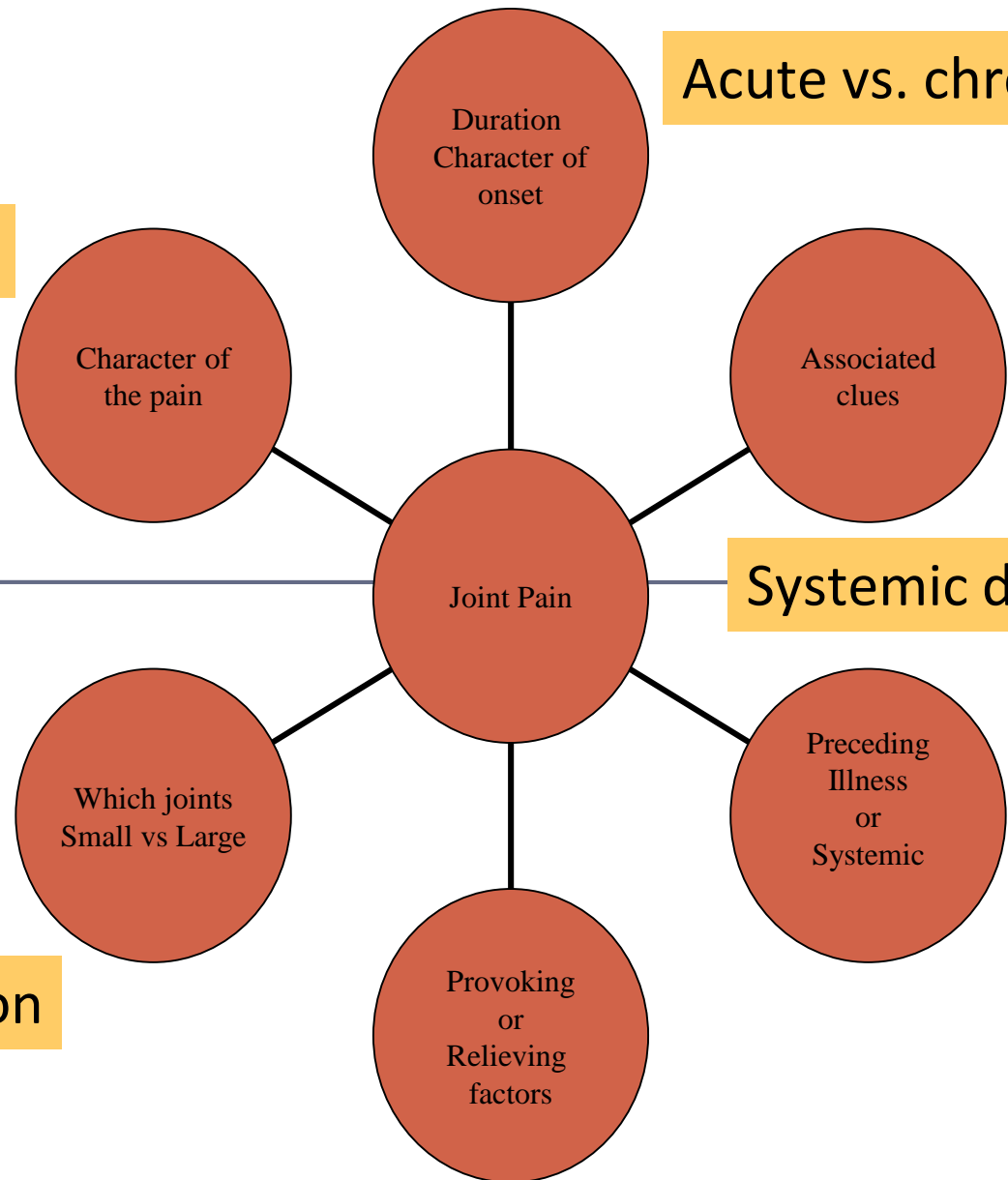
Common presenting symptoms

- Pain
 - Loss of function(motion)/stiffness
 - Numbness
 - Swelling
-

History

Articular vs. periarticular

Acute vs. chronic

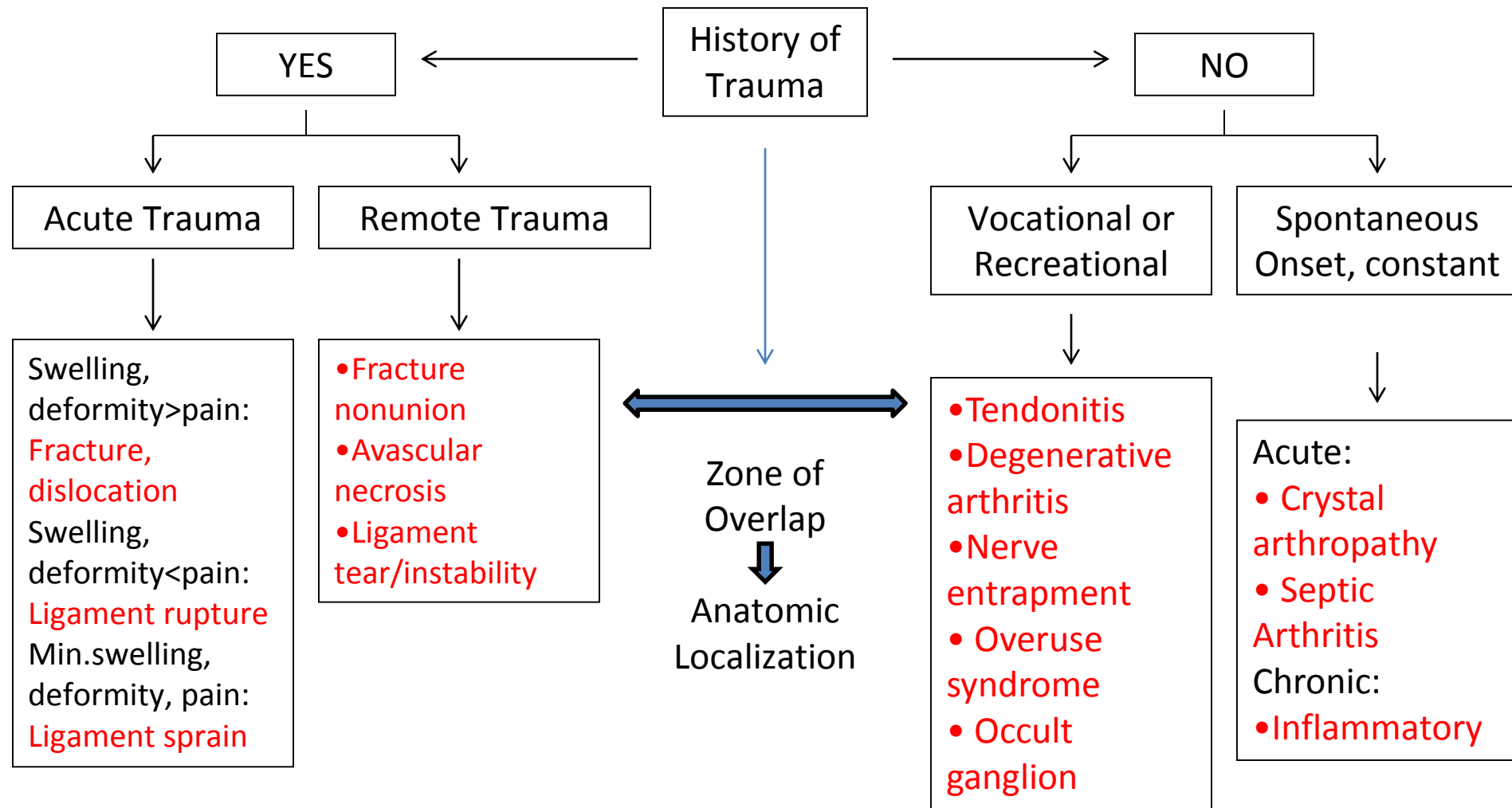


Systemic disease

Pattern recognition

Inflammatory vs. mechanical

Hand/Wrist Pain Symptom Algorithm



Physical examination – Hand and wrist



Clinical Examination

- **TWO** most important points in diagnosis is patient's ability to localize the site of pain and physician's ability to locate the site of tenderness
- Start examination at non tender/painful areas
- Examine for:
 - Swelling
 - Deformity
 - Range of motion (Flex/Ext, Pronation/Supination, RD/UD)
 - Tenderness
 - Provocative maneuvers
 - Grip strength

Signs of Clinical Importance

- Swelling
 - Focal/discrete swelling indicates mass lesion (largely benign)
 - Diffuse swelling indicates effusion/synovitis
- Deformity
 - Acute deformity is always significant (fracture/dislocation)
 - Positional deformity is important (volar sag/ulnocarpal translation/DRUJ instability)
- Range of motion and grip strength
 - Surrogates for severity of pathology
 - Significant (acute) loss of motion = fracture/dislocation

LOOK

Diffuse swelling
(chronic, atraumatic)



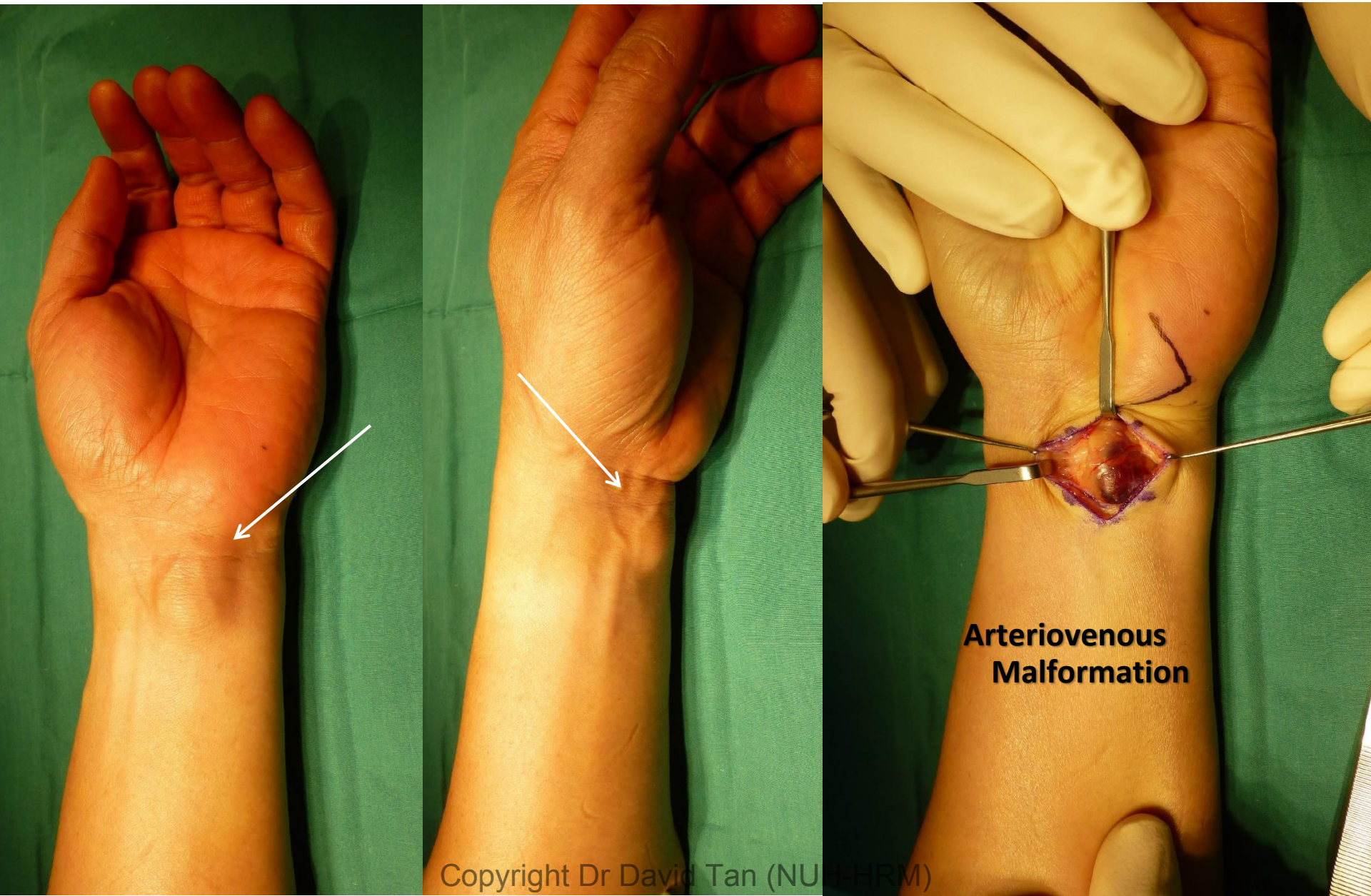
Right Wrist Effusion

Early RA

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Focal Swelling = Tumor Mass

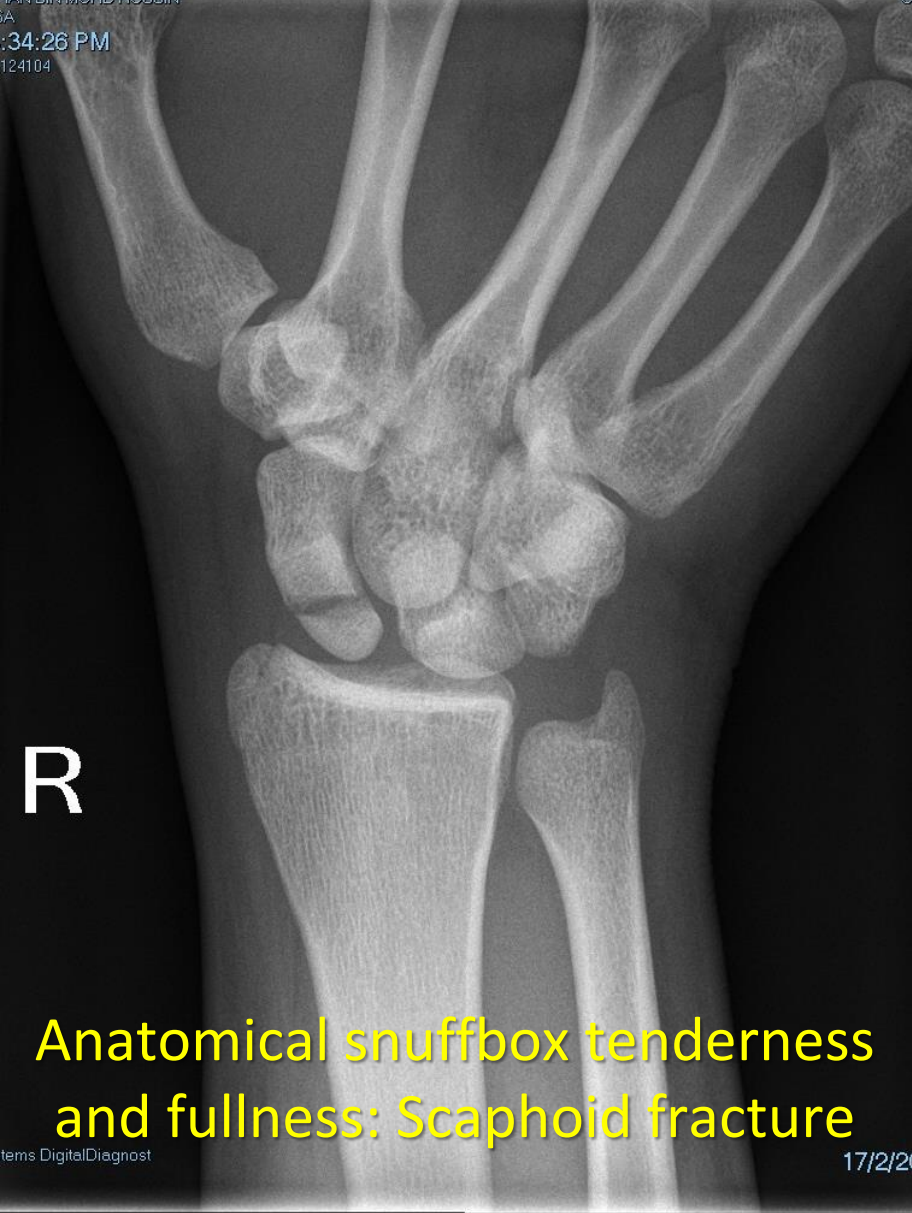




Localized swelling

(acute traumatic)

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Localized swelling

(acute traumatic)

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Localized dorsal wrist swelling

(irregular, painless)



Synovitis

Some are tumors





Subtle deformity : Static radiocarpal/ ulnocarpal/midcarpal
malalignment

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Ulna head prominence = DRUJ pathology

MOVE

Movements of the wrist

(Symmetric, fluid, painless)



Extension (radiocarpal-
midcarpal motion)

Flexion (radiocarpal-
midcarpal motion)

Supination
(DRUJ/PRUJ)

Ulnar deviation
(Ulnocarpal joint)

Pronation
(DRUJ/PRUJ)

Radial deviation
(Radial wrist joint)

Wrist posterior ulnar
deviation (ECU)

Copyright (Radial wrist joint) (SH-HRM)

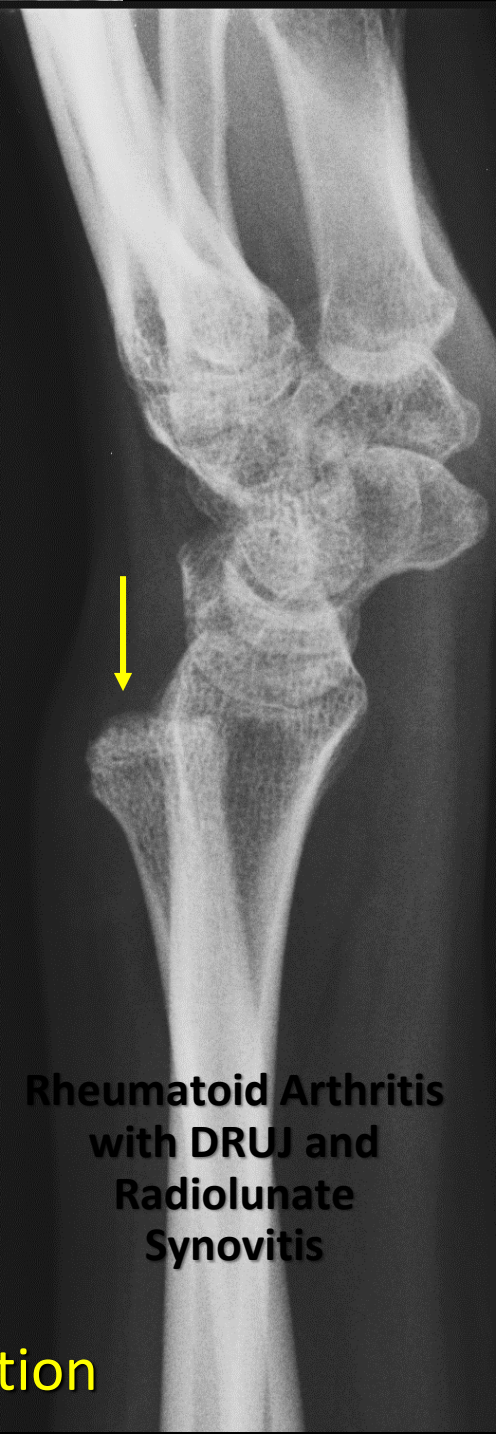


Abnormal flexion extension arc =
Radiocarpal/Midcarpal pathology



Loss of supination = Dorsal DRUJ dislocation

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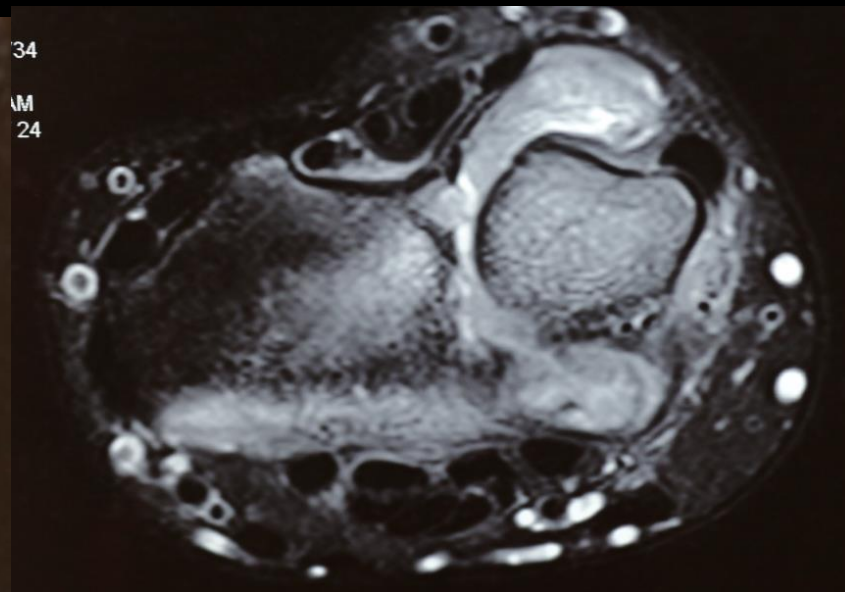


Rheumatoid Arthritis
with DRUJ and
Radiolunate
Synovitis



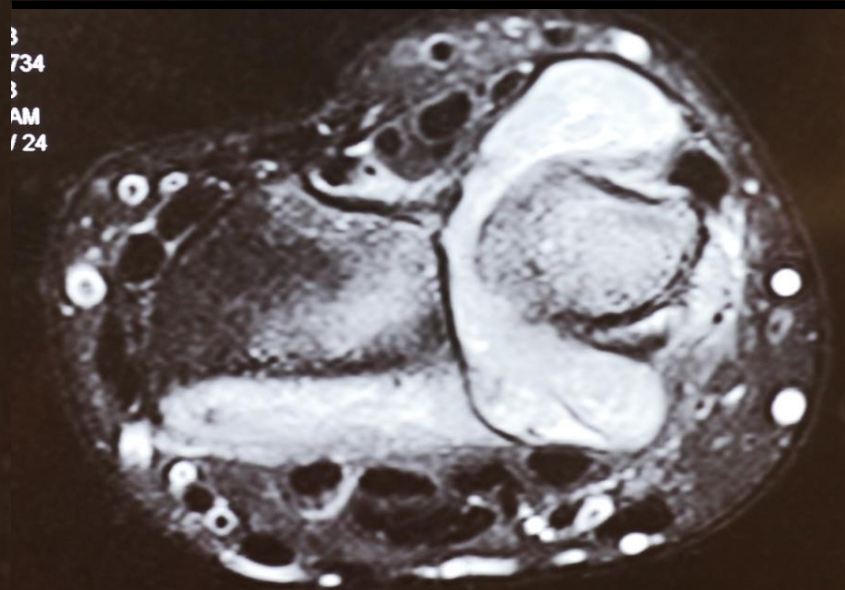
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Loss of pronation = Volar DRUJ Dislocation

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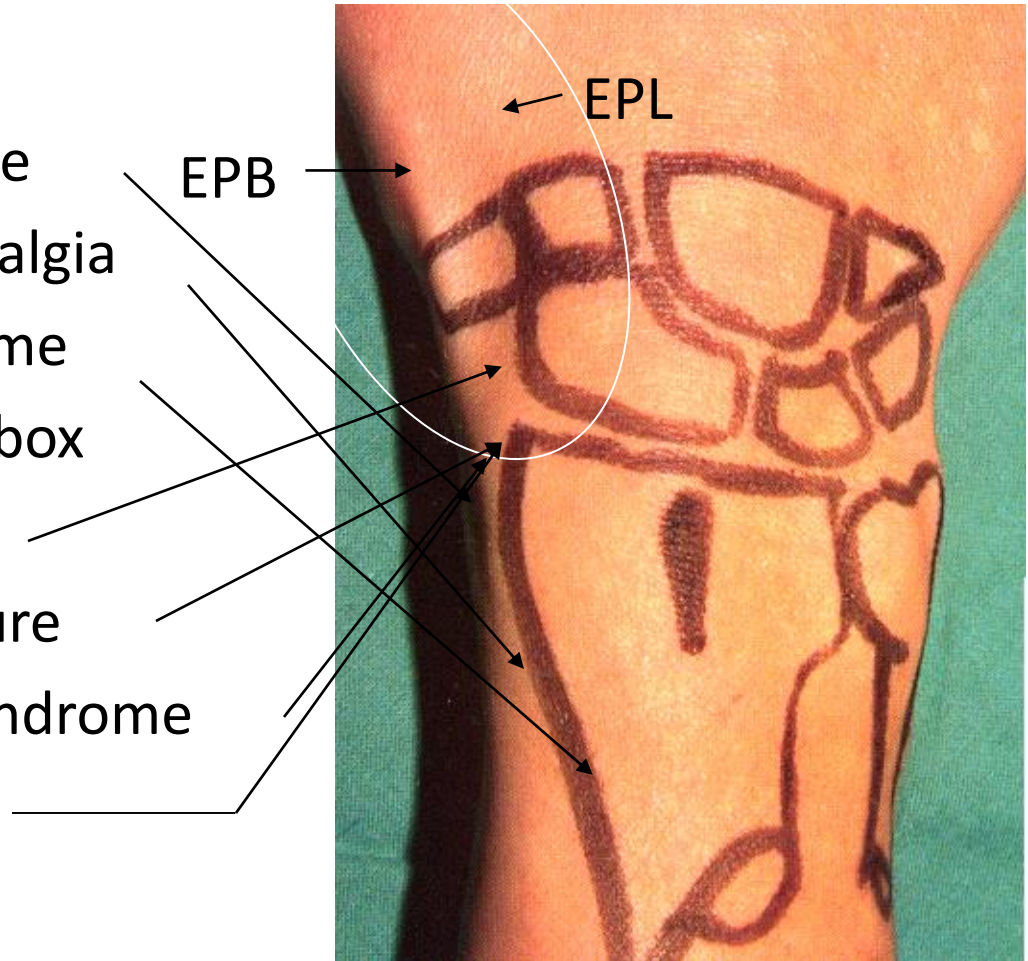
FEEL (PALPATE/PROVOCATIVE TESTS)

Where's the pathology? A topographic study

| Radial | Dorsal | Dorso Ulnar | Volar Ulnar | Volar Radial |
|--------------------------------|------------------------------|------------------------------------|--------------------------------|--------------------------------|
| Wartenberg neuritis | Intersection syndrome | DRUJ instability/OA | TFCC tear | FCR tendonitis |
| DeQuervain's | Distal radius fracture | Lunotriquetral instability | FCU tendonitis | Scaphoid tubercle fracture |
| Styloid arthritis | Occult ganglion | Triquetral fracture | Pisiotriquetral dysfunction/OA | Scapho-trapezial arthritis |
| Styloid fracture | Dorsal impingement | ECU tendonitis/ subluxating ECU | Hamate hook fracture | 1 st CMCJ arthritis |
| Scaphoid waist fracture | Scapholunate instability | Ulnocarpal abutment | Hypothenar hammer syndr | |
| 1 st CMCJ arthritis | Scaphoid prox. pole fracture | TFCC tear | | |
| | Lunate AVN | Ulna head/ styloid fracture | | |
| | Lunate fracture | Midcarpal instability | | |

Radial Sided Wrist Pain

- Tender over radial styloid
 - Dequervain's Disease
 - Wartenberg's Neuralgia
 - Intersection Syndrome
- Tender in anatomical snuff box
 - Scaphoid Fracture
 - Radial Styloid Fracture
 - Radial Impaction Syndrome
 - Radial Styloid OA



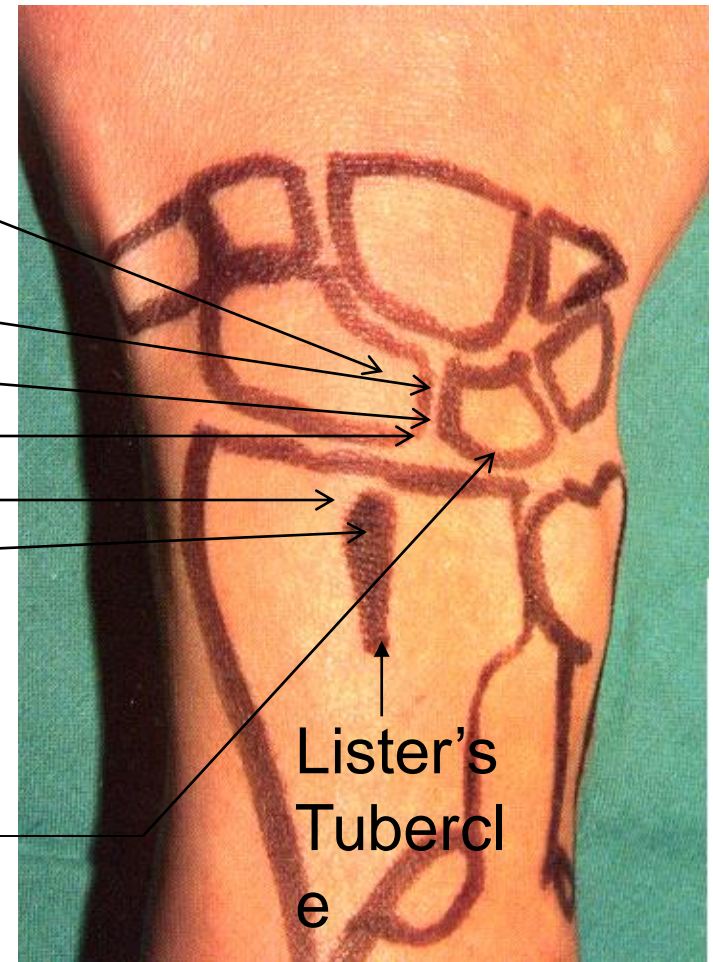
Dorso-Radial Wrist Pain

Tenderness at/distal to Lister's Tubercle

- Scaphoid proximal pole fracture
- SL tears/instability
- Dorsal Wrist Ganglion
- Wrist impingement
- Gymnast Wrist
- Distal radius fracture

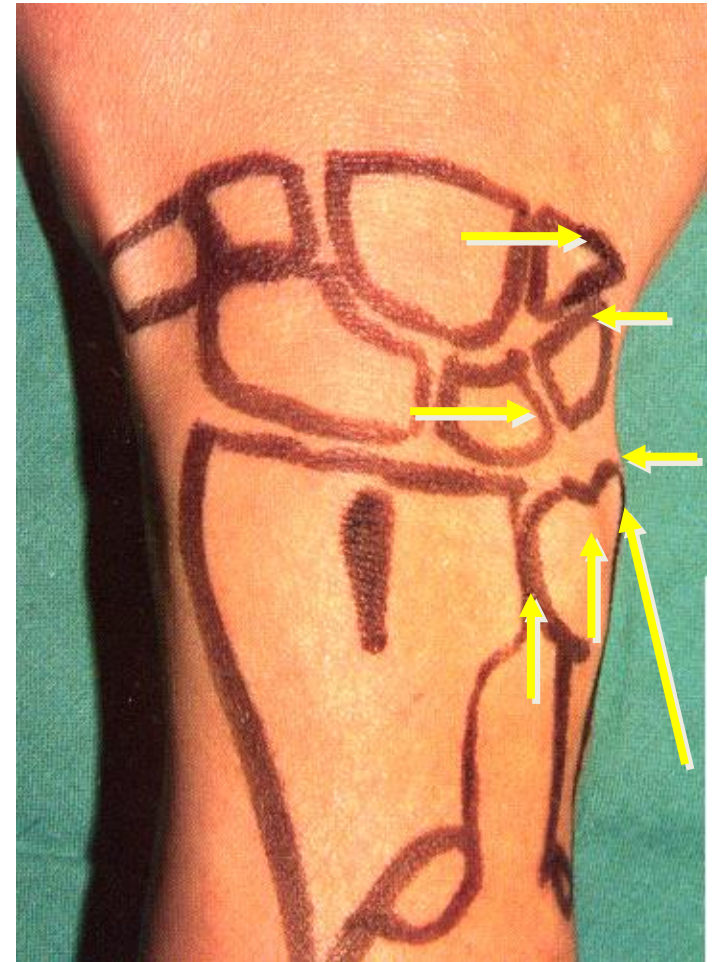
Tenderness Ulnar to Lister's tubercle

- Lunate fractures
- Kienbock's Disease



Dorso-Ulnar Wrist Pain

- DRUJ instability, sprains, arthritis
- Ulna head and styloid fractures
- ECU tendinitis
- TFCC tears/ulnocarpal abutment
- LT sprains and instability
- Midcarpal instability
- Hamate body/Base of 5th metacarpal fractures



Volar Radial Wrist Pain

- 1st CMCJ instability/OA

- Trapezium fractures

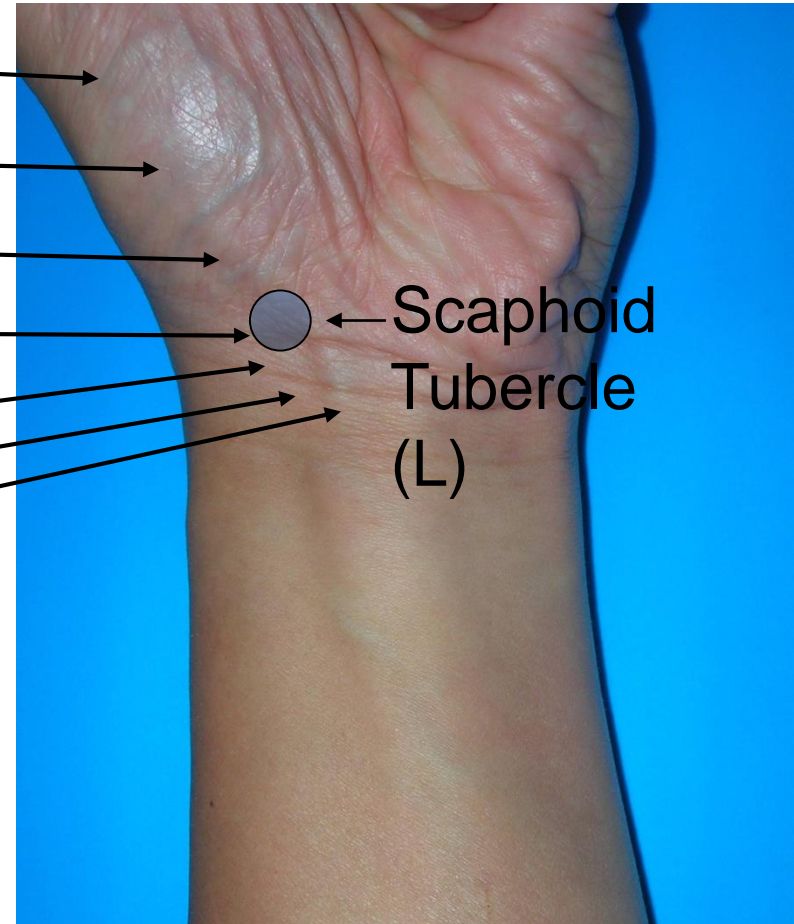
- STT OA

- Scaphoid tubercle fractures

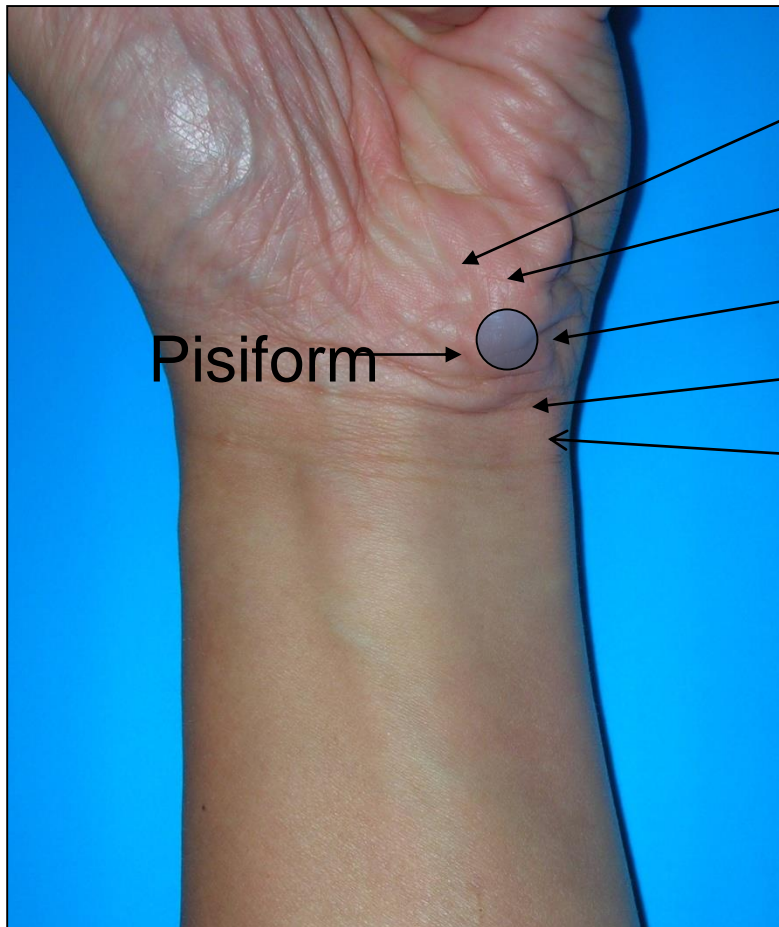
- Neuritis/compression PCBMN

- Volar wrist ganglion

- FCR tendinitis



Volar Ulnar Wrist Pain



Pisiform

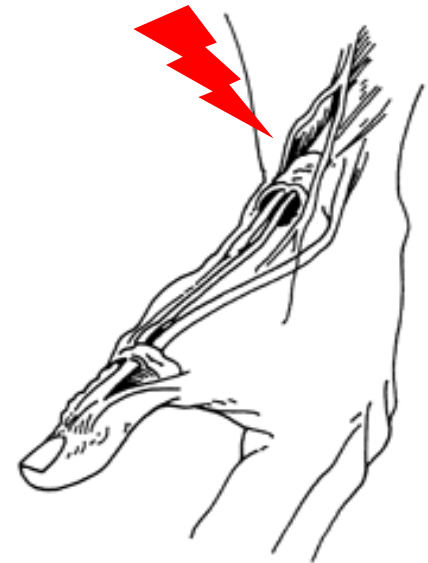
- Hamate hook fractures
- Hypothenar hammer syndrome
- Pisotriquetral OA
- FCU tendinitis
- TFCC tear (volar)

Specific Wrist Conditions

De Quervain's Disease

De Quervain's disease

- Most common tendiopathy in the wrist
- Fritz de Quervain (1895): a specific entity involving **APL** & **EPB** sheaths
- Grays anatomy (1893): similar entity - “washerwoman’s sprain”
- More common in
Middle aged (4th – 5th decade)
Women (up to 6 times)
Nursing mothers

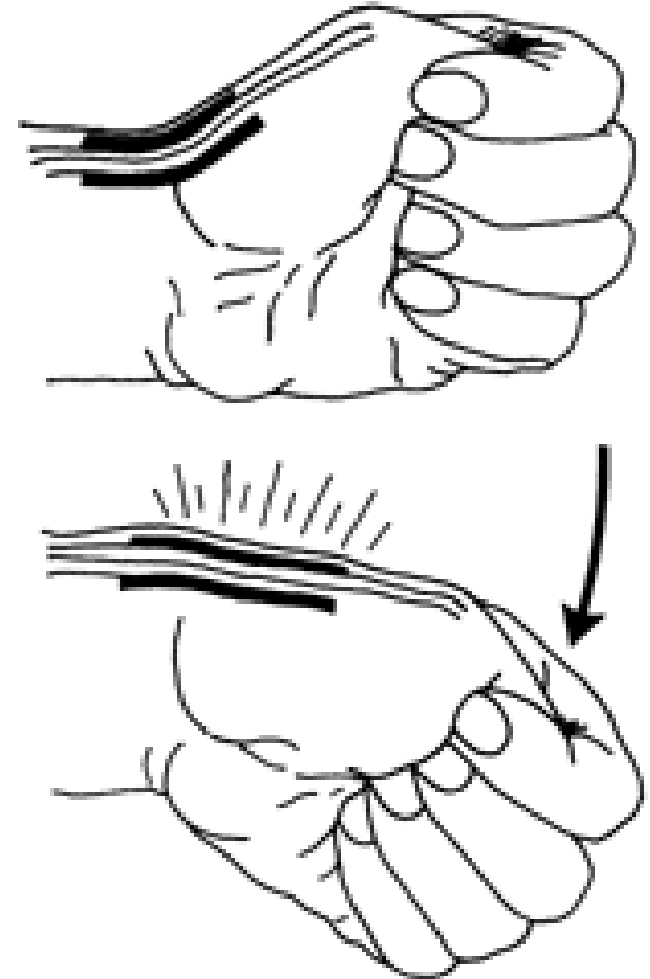


Pathogenesis –De Quervain's Disease

- Frequent abduction of thumb with wrist flexion an/or ulnar deviation of the wrist with load
- Acute angulation of tendons at retinaculum with wrist in extension/flexion

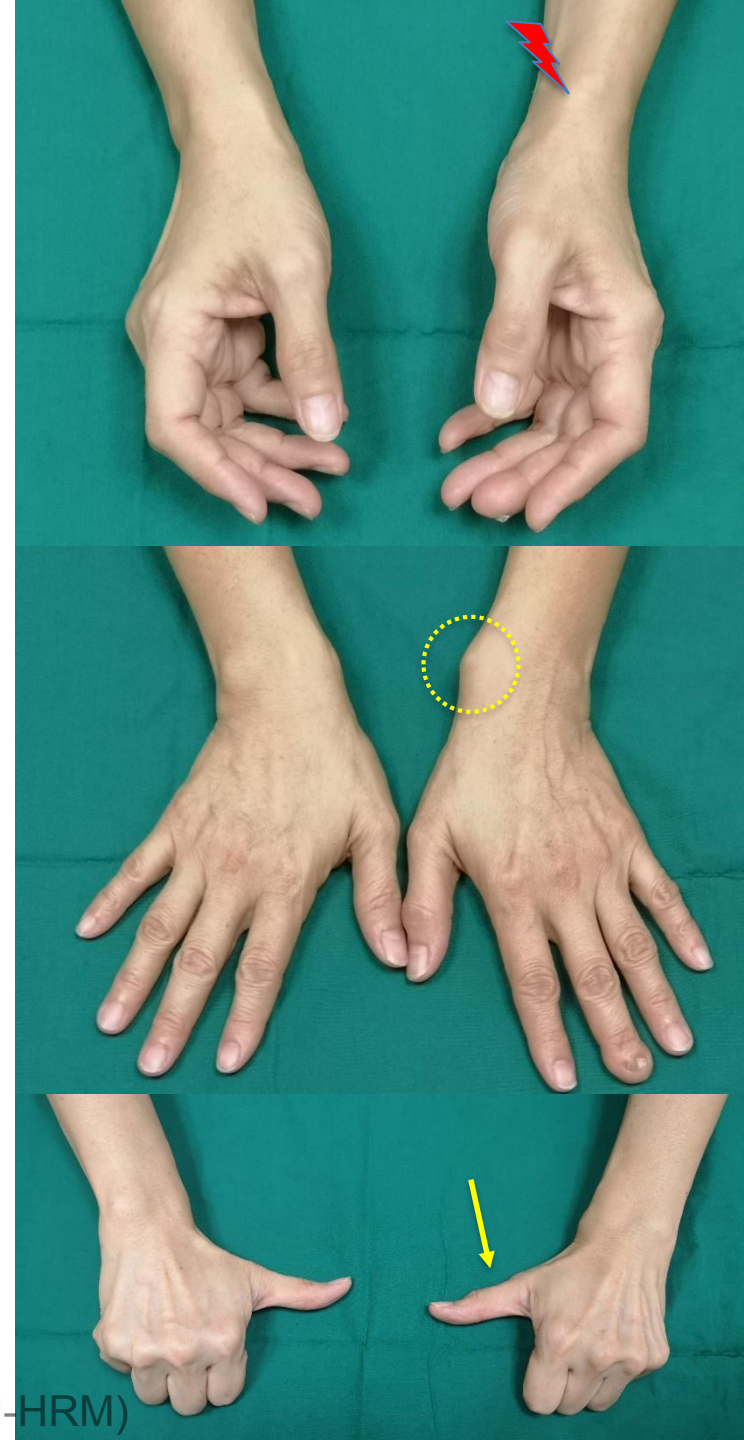


- Friction at rigid retinaculum
- Swelling of tendon synovial sheath compounded by narrowing of fibrous retinacular sheath



Clinical Features

- Radial sided wrist pain
- Ulnar deviation activity – pouring jug, carrying pot, hanging out clothes
- Wrist flexion activity – cradling baby, reaching back, lifting
- Swelling and tenderness of the 1st extensor compartment
- Restriction of wrist motion (severe)
- Provocative tests
 - Eichhoff's/Finkelstein's
 - Hitchiker's
 - WHAT (Wrist Hyperflexion Abduction of Thumb)



Provocative Tests – De Quervain's

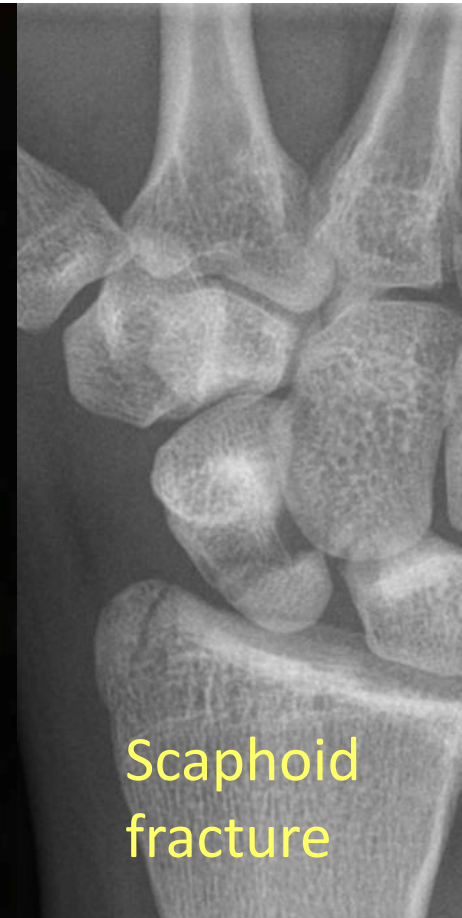


Finkelstein's Test

Eichoff's Test

WHAT Test

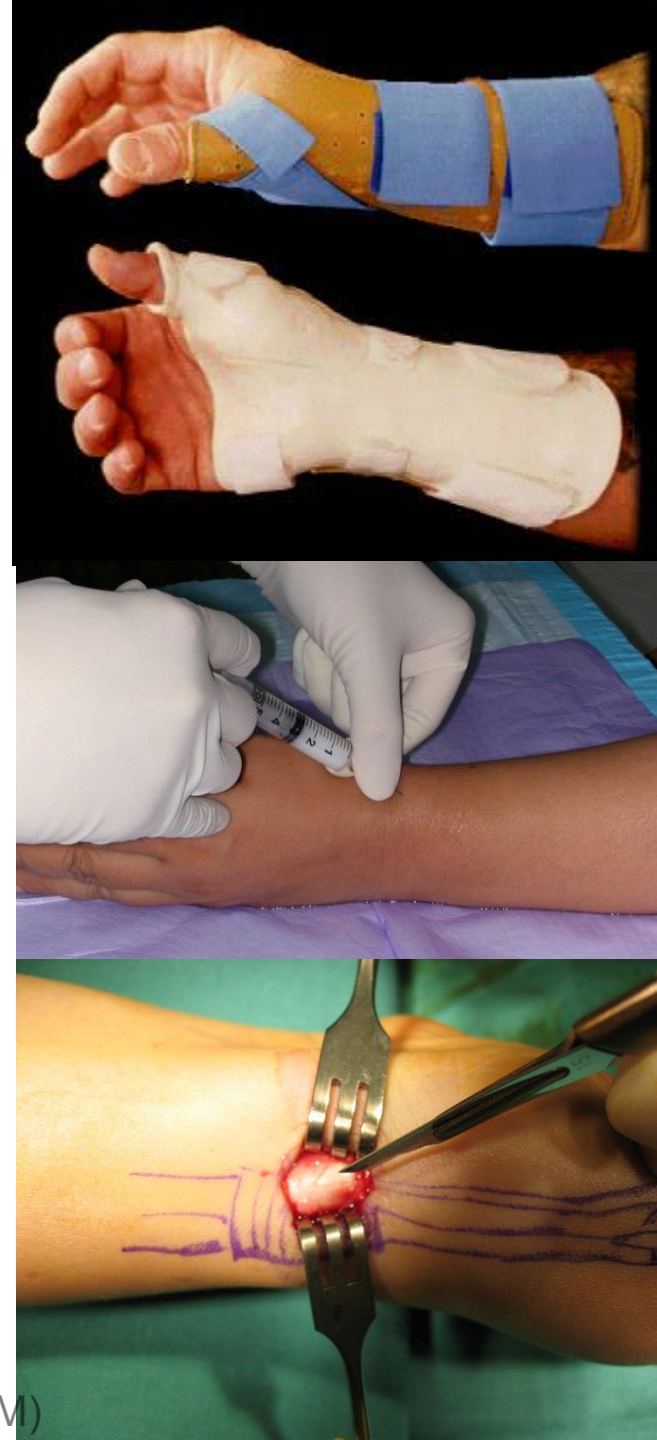
Differential Diagnosis



Others: Radiocarpal arthritis, scaphotrapezial arthritis, scaphoid fracture nonunion, superficial radial nerve neuritis, etc.

Treatment

- Splinting and NSAIDs – 30-40% resolve at 2 months (mainly mild/early cases)
- Steroid injections – 70% efficacy (risk of fat atrophy, hypopigmentation, may miss septated compartment)
- Surgery for persistent/severe cases – low risk

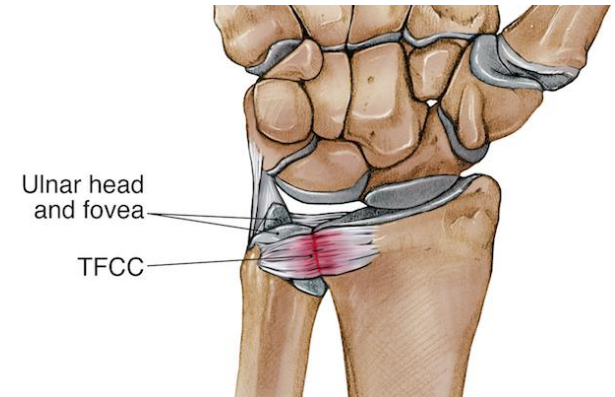


Specific Wrist Conditions

TFCC Tears

TFCC Tears

- Triangular fibrocartilage complex: Ligament of the distal radioulnar joint
- Most common cause of ulnar sided wrist pain
- Palmer classification: traumatic (acute/chronic) and degenerative (chronic)
- Acute: FOOSH, sudden torque, sudden ulnar sided traction
- Degenerative: repetitive excessive ulnocarpal loading
- Tears may be peripheral or central



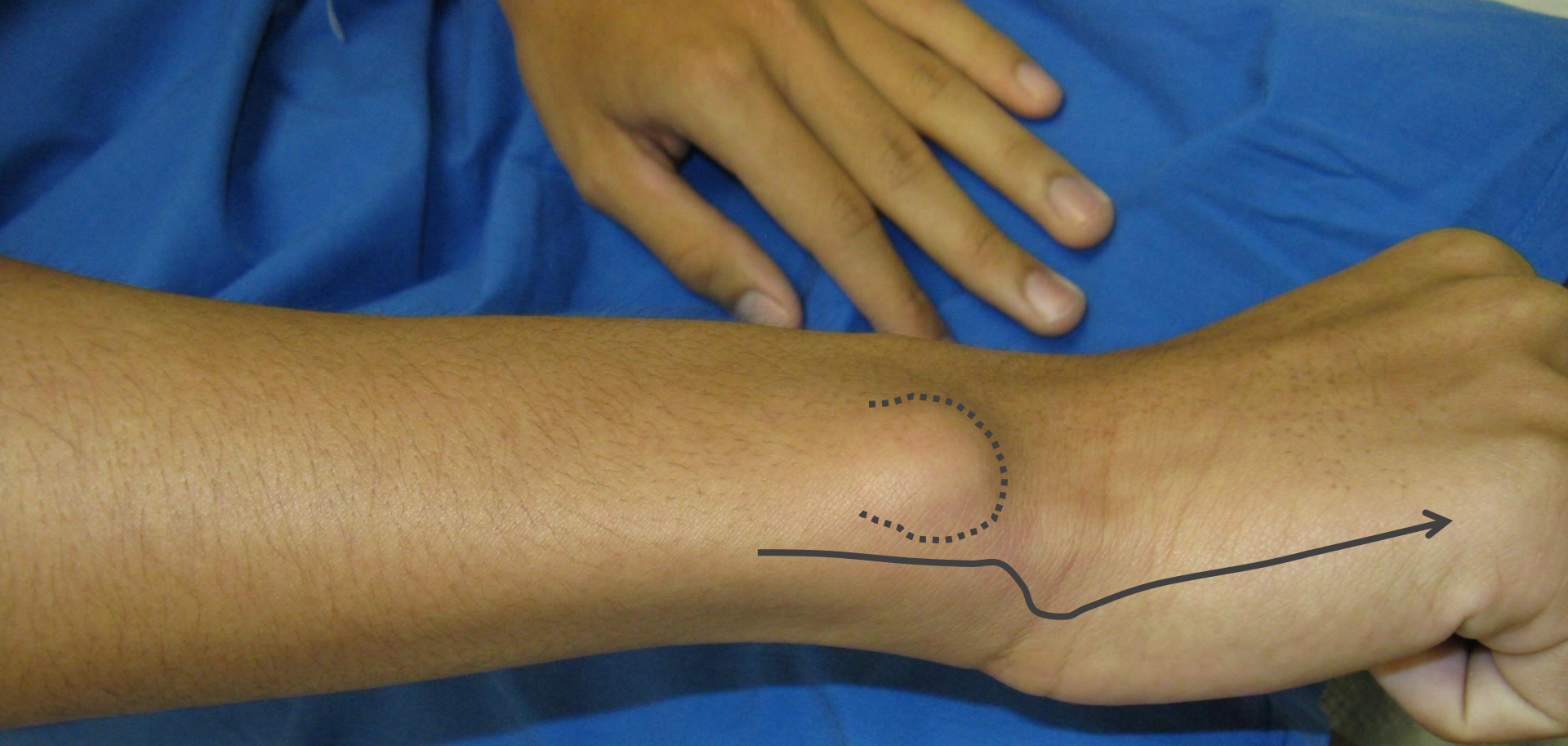
DRUJ Instability, TFCC Injuries – Pathology and Treatment

- **Broad Concepts**

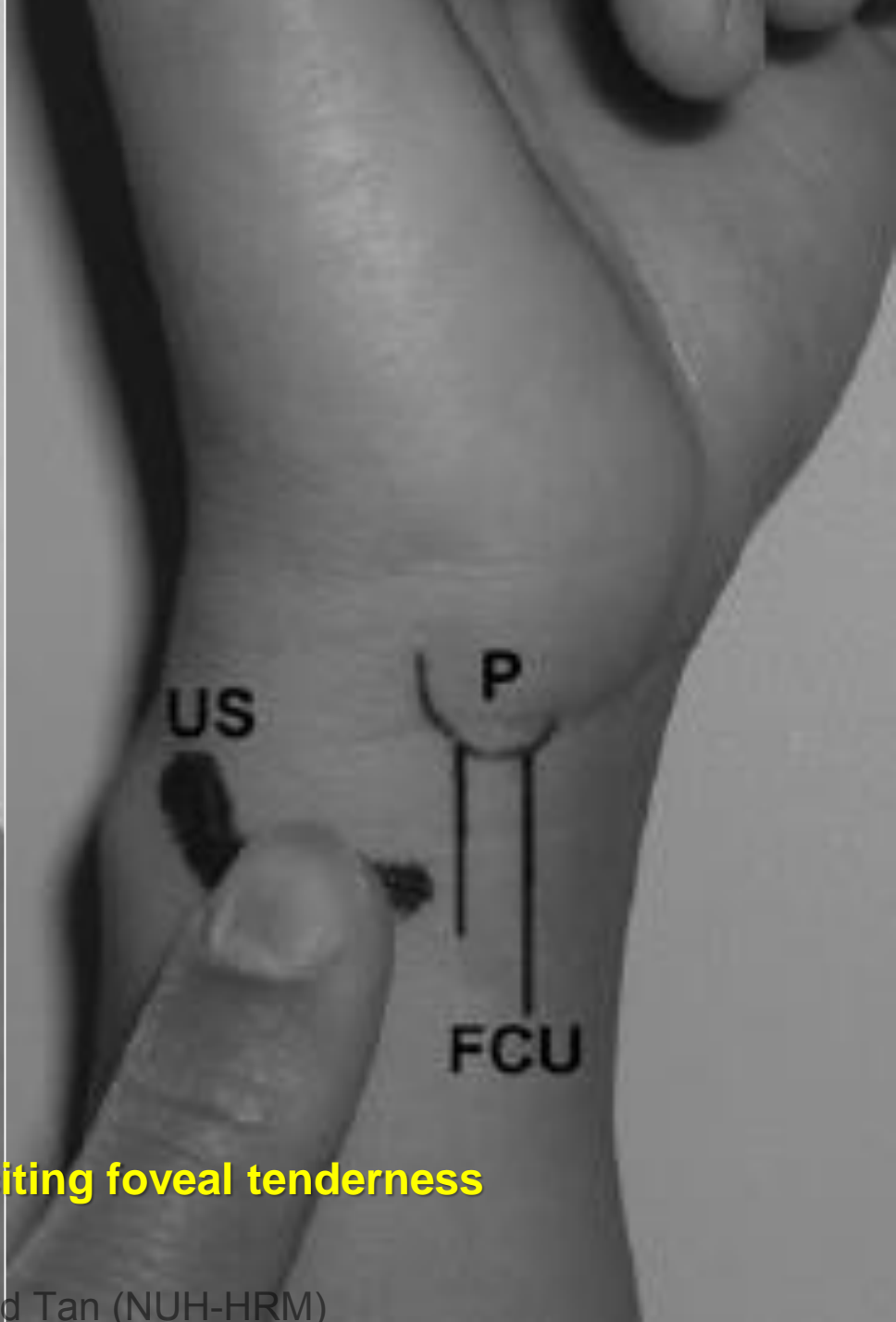
- TFCC Tear \neq DRUJ instability
- Central TFCC tears = pain, Peripheral TFCC tears = pain + instability
- DRUJ instability is a spectrum: Peripheral TFCC tears (mild-moderate-severe) > Dislocations & Fracture Dislocations > Forearm Malunions
- Acute DRUJ dislocations – distinct from chronic DRUJ instability/dislocation

Clinical Evaluation – TFCC tears

- Swelling (subtle) around the distal ulna vs prominent ulna head (moderate DRUJ instability) *Fig*
- Supination/Pronation – loss is mild to modest unless significant DRUJ subluxation is present
- Flexion extension frequently normal
- Foveal tenderness , tenderness around the DRUJ, dorsal peripheral and volar peripheral rim of TFCC *Fig*
- Piano key/ulna head ballotment and ability to translate ulna head in extremes or pronation and supination = significant DRUJ instability



Volar sag of the wrist and prominence of ulna head



Location of fovea and eliciting foveal tenderness

Piano Key Test



DRUJ Ballotment

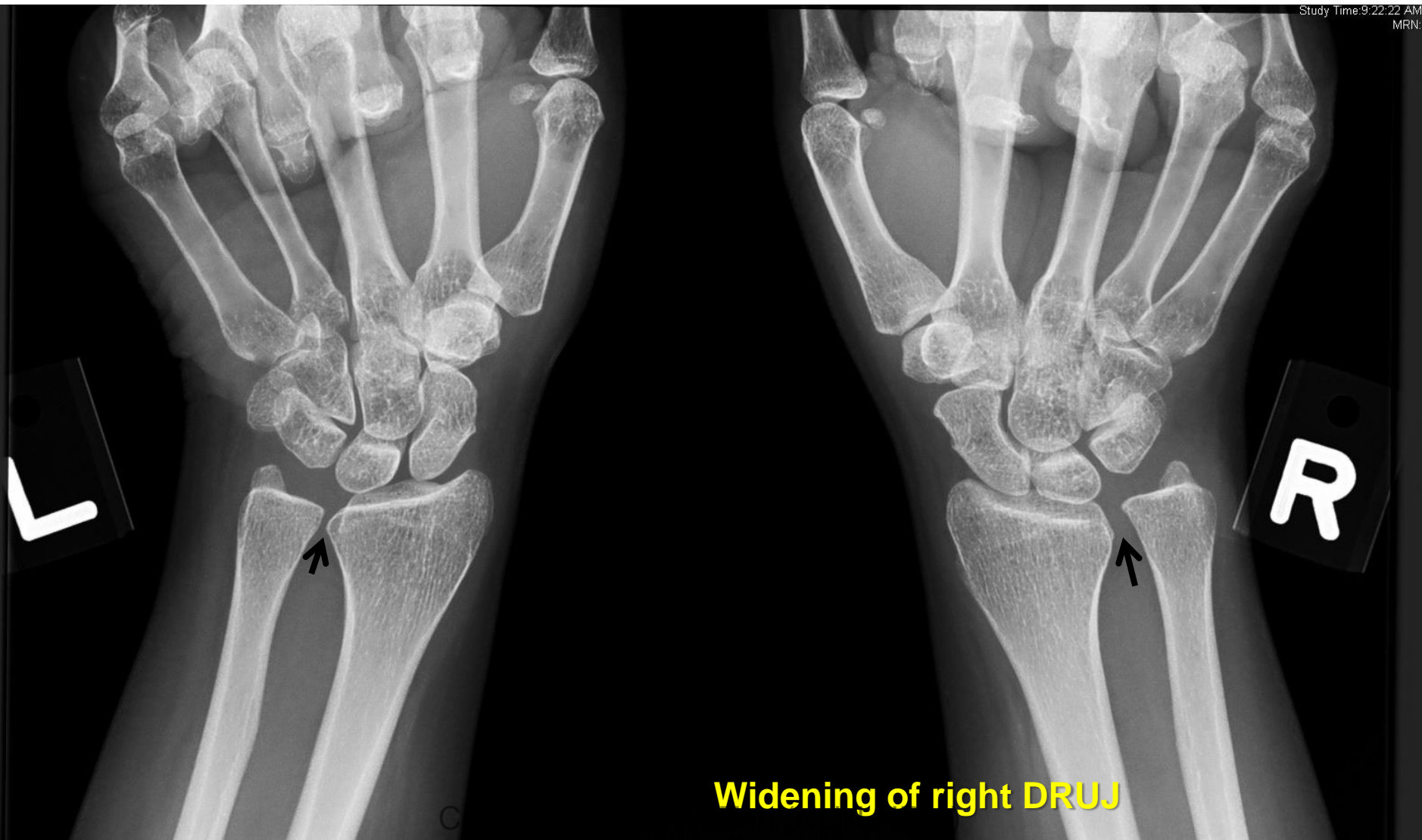


Dorsal Instability



Volar instability

Imaging – TFCC injury



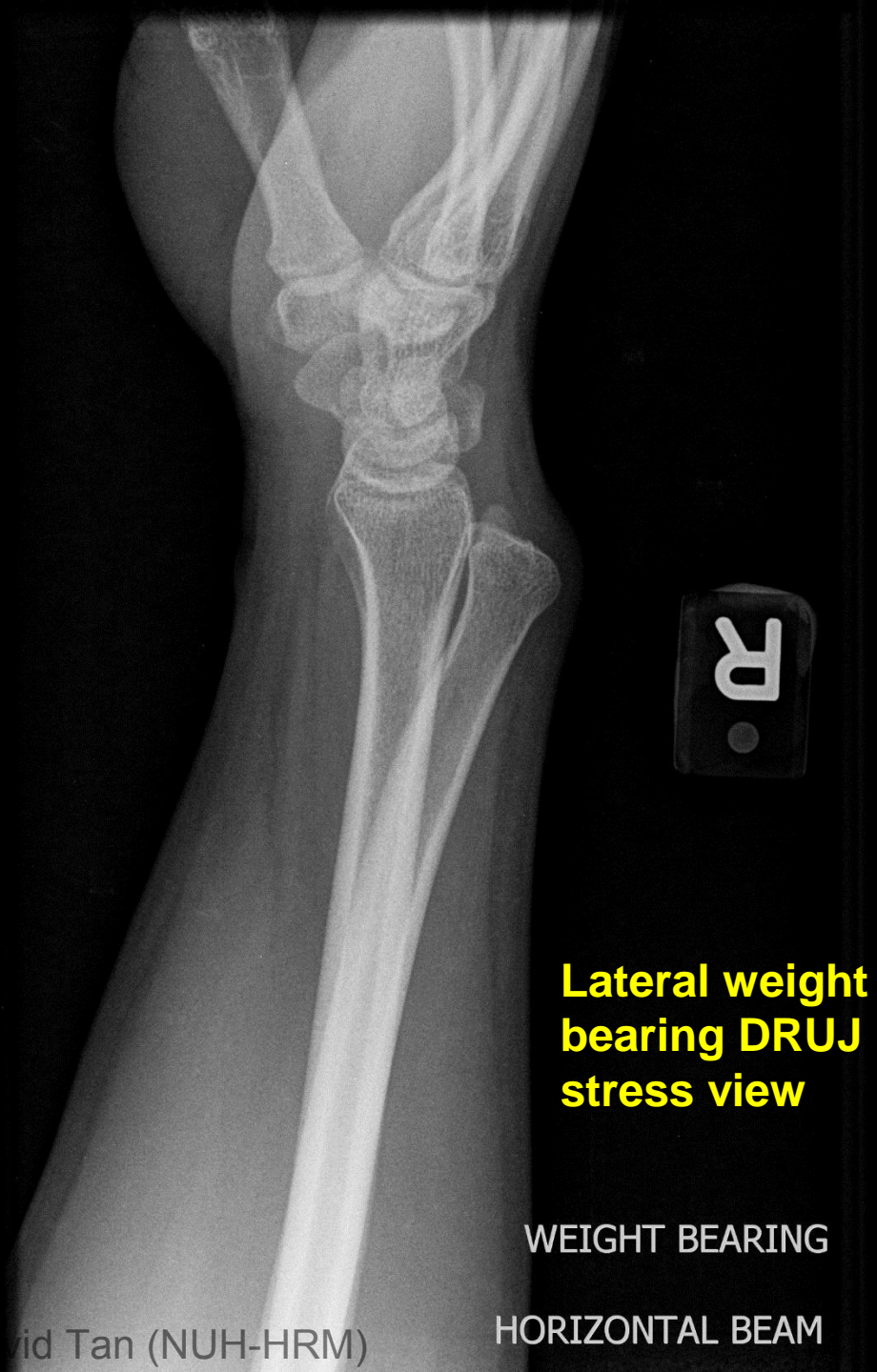
Imaging – TFCC injury





HORIZONTAL BEAM
WEIGHT BEARING

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Lateral weight
bearing DRUJ
stress view

WEIGHT BEARING
HORIZONTAL BEAM



Treatment

- Many ($>2/3$) will experience good relief with rest (Muenster splint), anti-inflammatories
- Chronic central tears (persistently painful): trial of steroid injection into ulnocarpal joint
- Refractory pain:
 - ligament repairs/reconstruction for TFCC tear with DRUJ instability
 - TFCC debridement and ulna shortening/wafer for chronic central tears



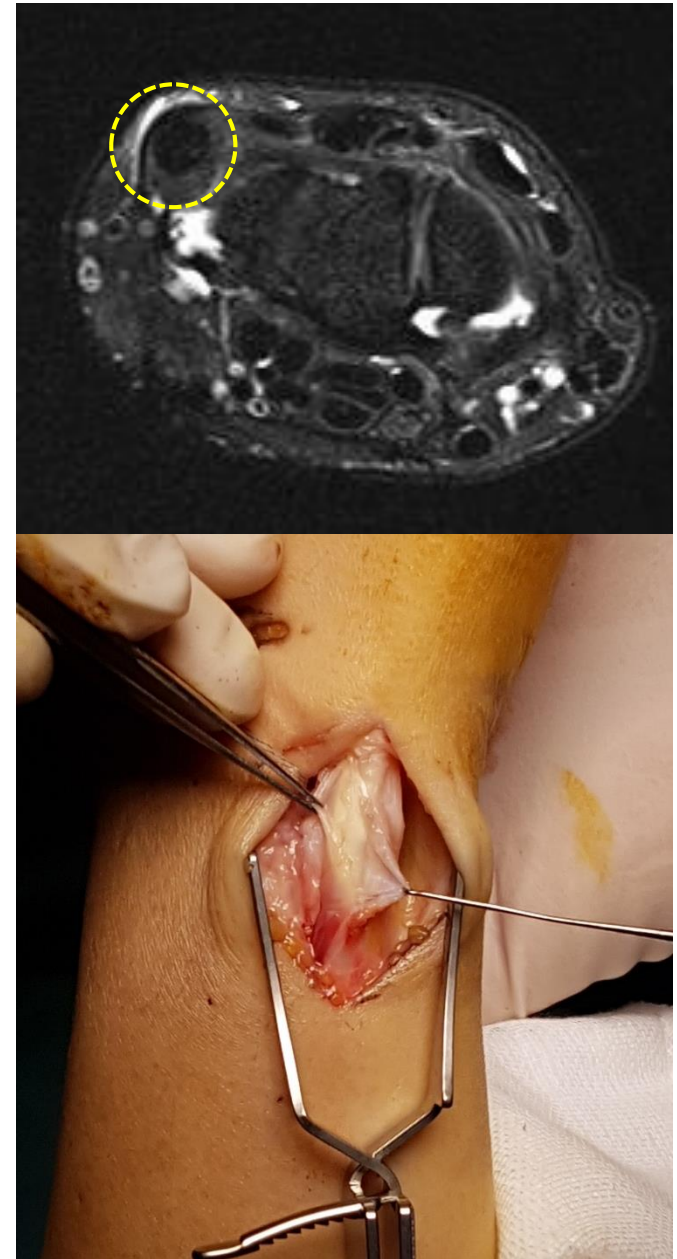
Specific Wrist Conditions

ECU Disorders

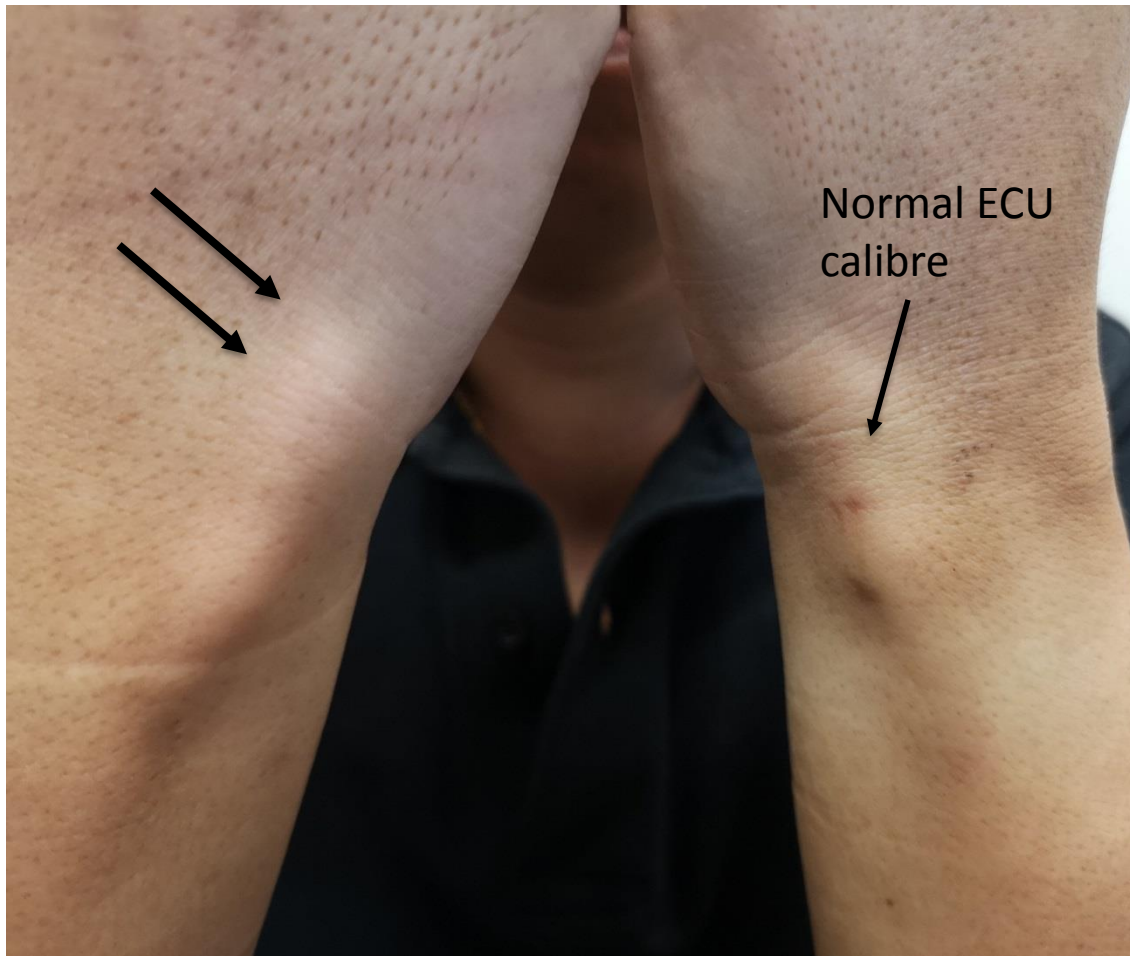
- Tendonitis
- Instability

ECU tendonitis

- Ulnar side wrist pain: 2nd most common tendinopathy of the wrist
- Repetitive ulnar deviation with wrist in flexed/extended postures
- Akin to De Quervain's disease, loading on tendon and friction within narrow fibrous tunnel
- Conservative Rx: ulnar gutter splint, NSAIDs, steroid injections
- Decompression and synovectomy



ECU tendonitis - signs



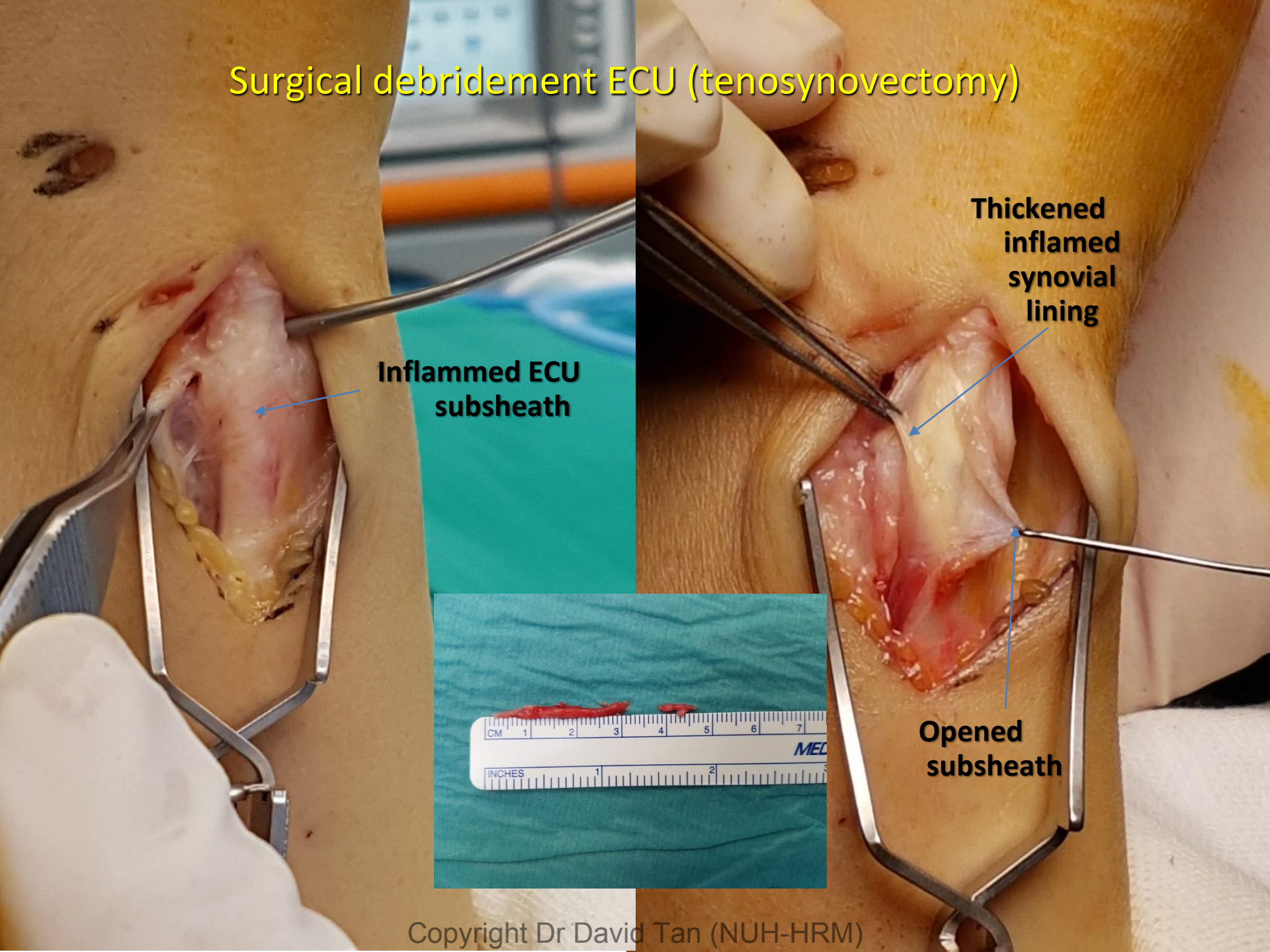
Swelling and tenderness of distal ECU (R)



ECU synergy test

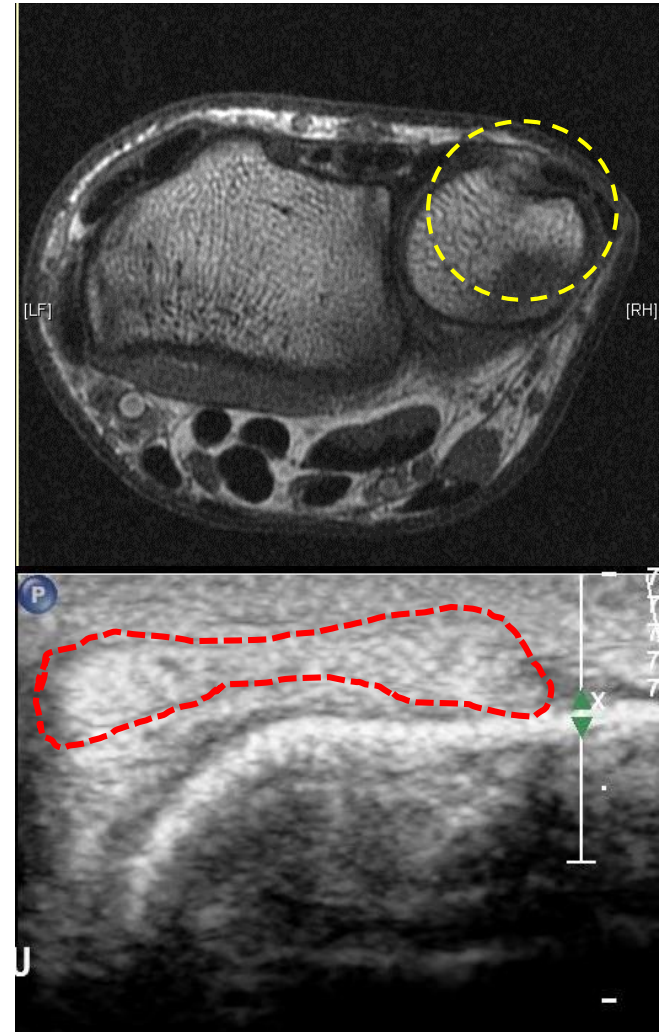


Surgical debridement ECU (tenosynovectomy)



ECU instability

- Ulnar side wrist pain: due to excessive mobility of the ECU tendon from disruption of its subsheath
- Spectrum of conditions: ECU mobility, subluxation, dislocation
- Traumatic causes, inflammatory causes (RA)
- Clinical features
 - maltracking
 - excessive mobility
 - subluxation



- ECU instability – clinical signs
 1. Excessive mobility
 2. Maltracking
 3. Subluxation

1. ECU Mobility test



2. ECU maltracking



3. ECU subluxation



ECU instability - Treatment

- Asymptomatic/mild cases – nil treatment
- Symptomatic: rest with splints and NSAIDs
- Refractory symptoms or when associated with DRUJ instability/caput ulnae: surgical stabilization

Hand Examination – Pertinent considerations

- Swelling
 - Localized to joint, or along length of digit?
 - Diffuse or discrete?
- Abnormal digital postures
 - Boutonniere, swan neck, mallet
- Tenderness
 - Localizes pathology
- Motion deficits
 - Passive ROM > active ROM = tendon pathology

Swelling



Acute Swollen Digit
(Flexor Tenosynovitis)

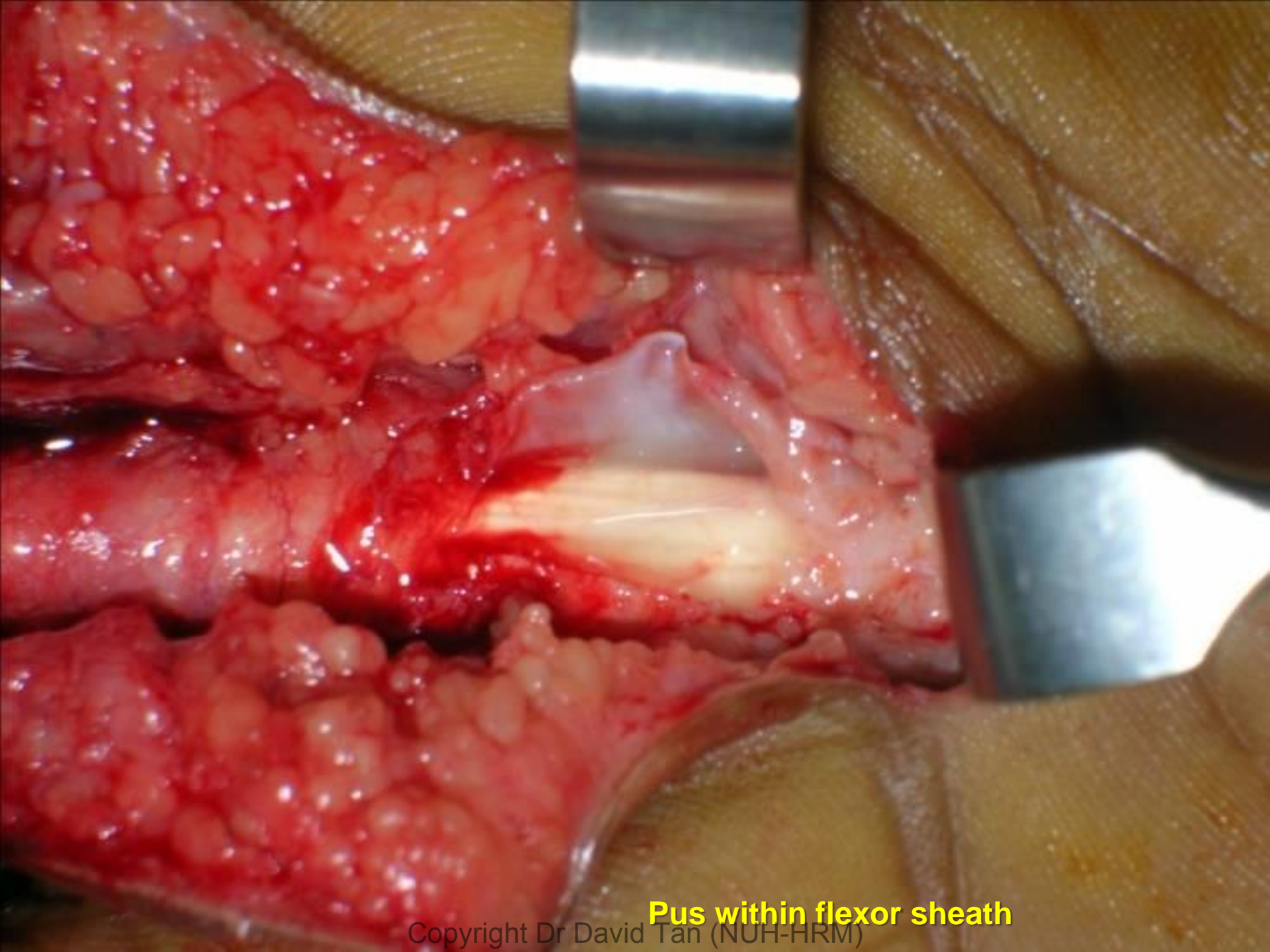


Suppurative Flexor Tenosynovitis
Kanavel's Cardinal Signs:

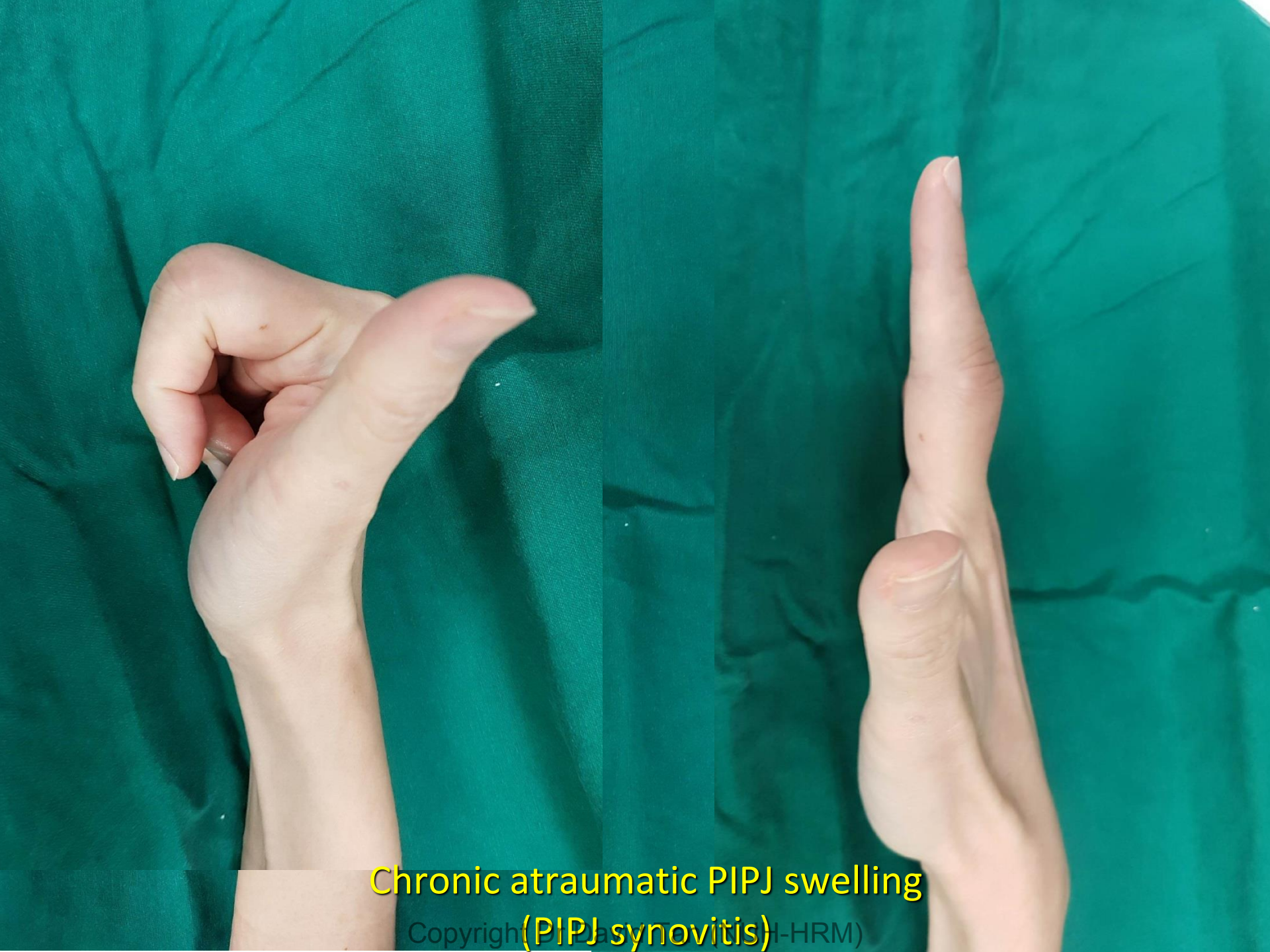
- Fusiform swelling
- Tenderness along flexor sheath
 - Flexed digit
- Pain on passive extension



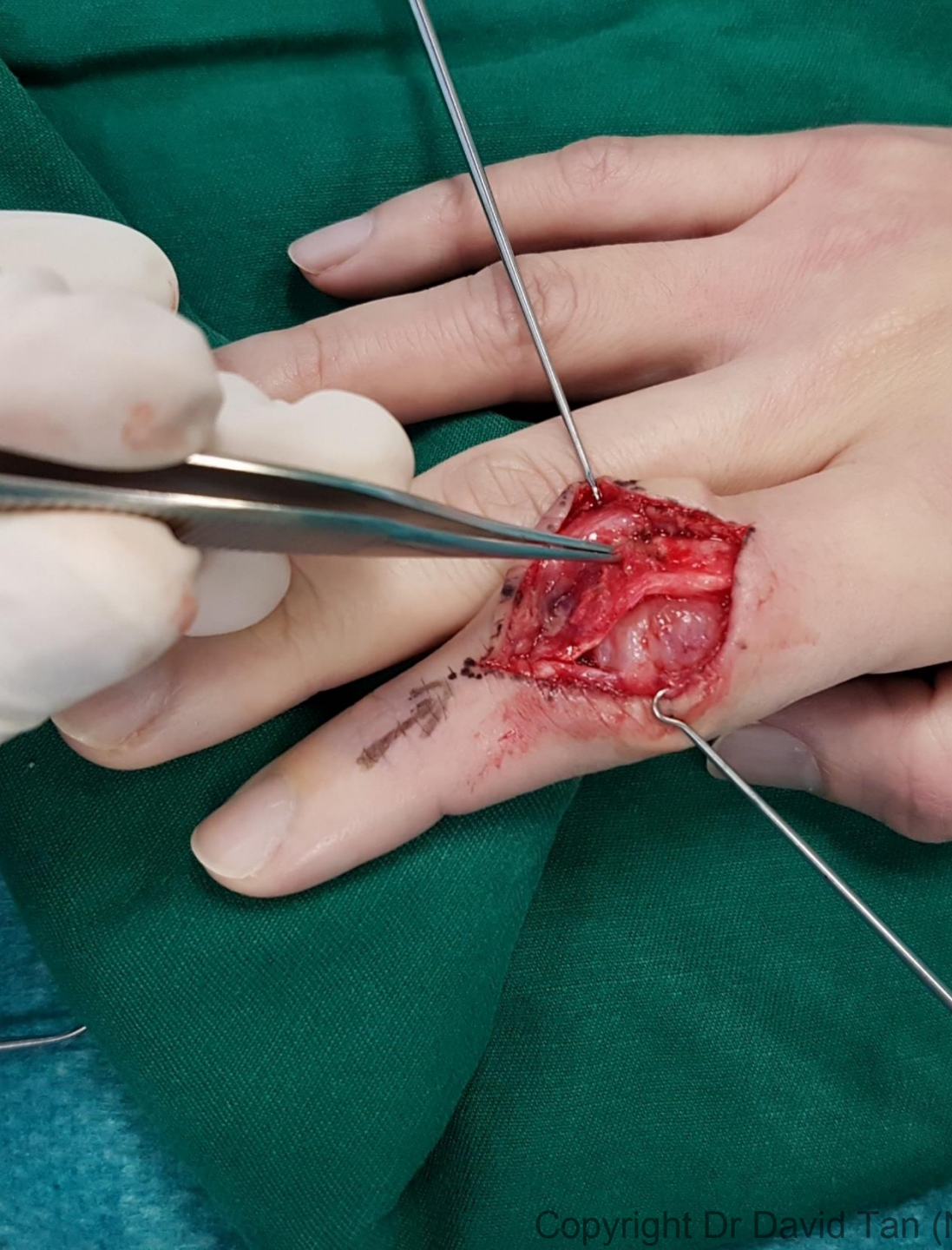




Pus within flexor sheath

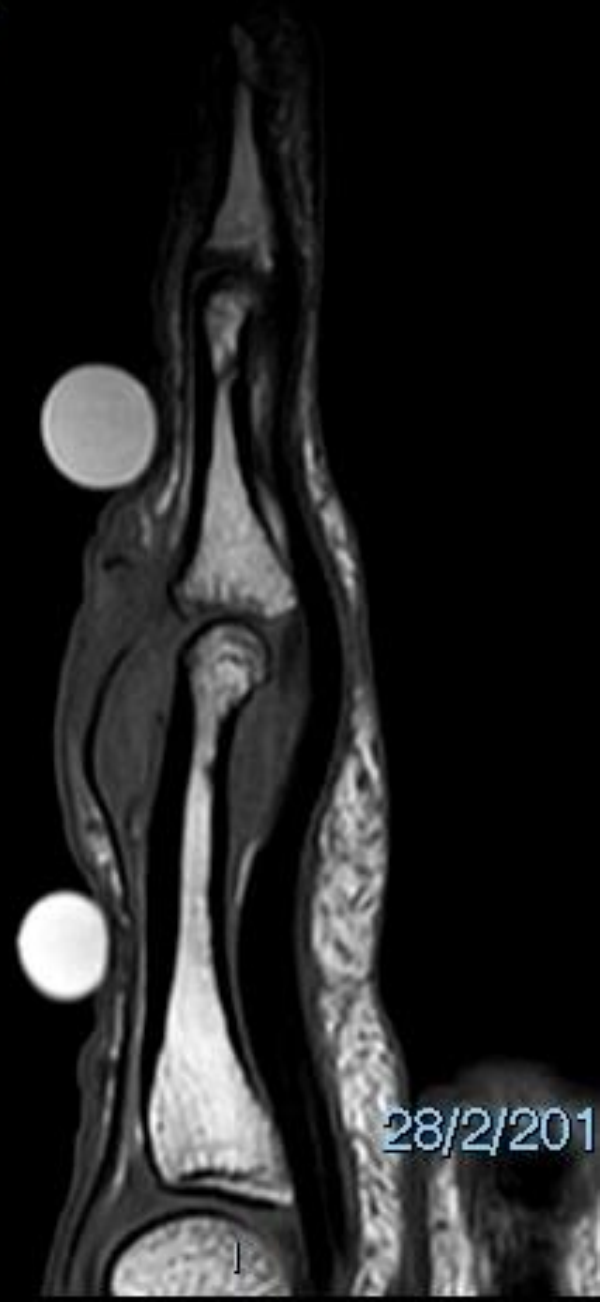


Chronic atraumatic PIPJ swelling
(PIPJ synovitis)



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DIPJ swelling in OA hands
(Heberden's nodes, mucous cysts, joint deformity)





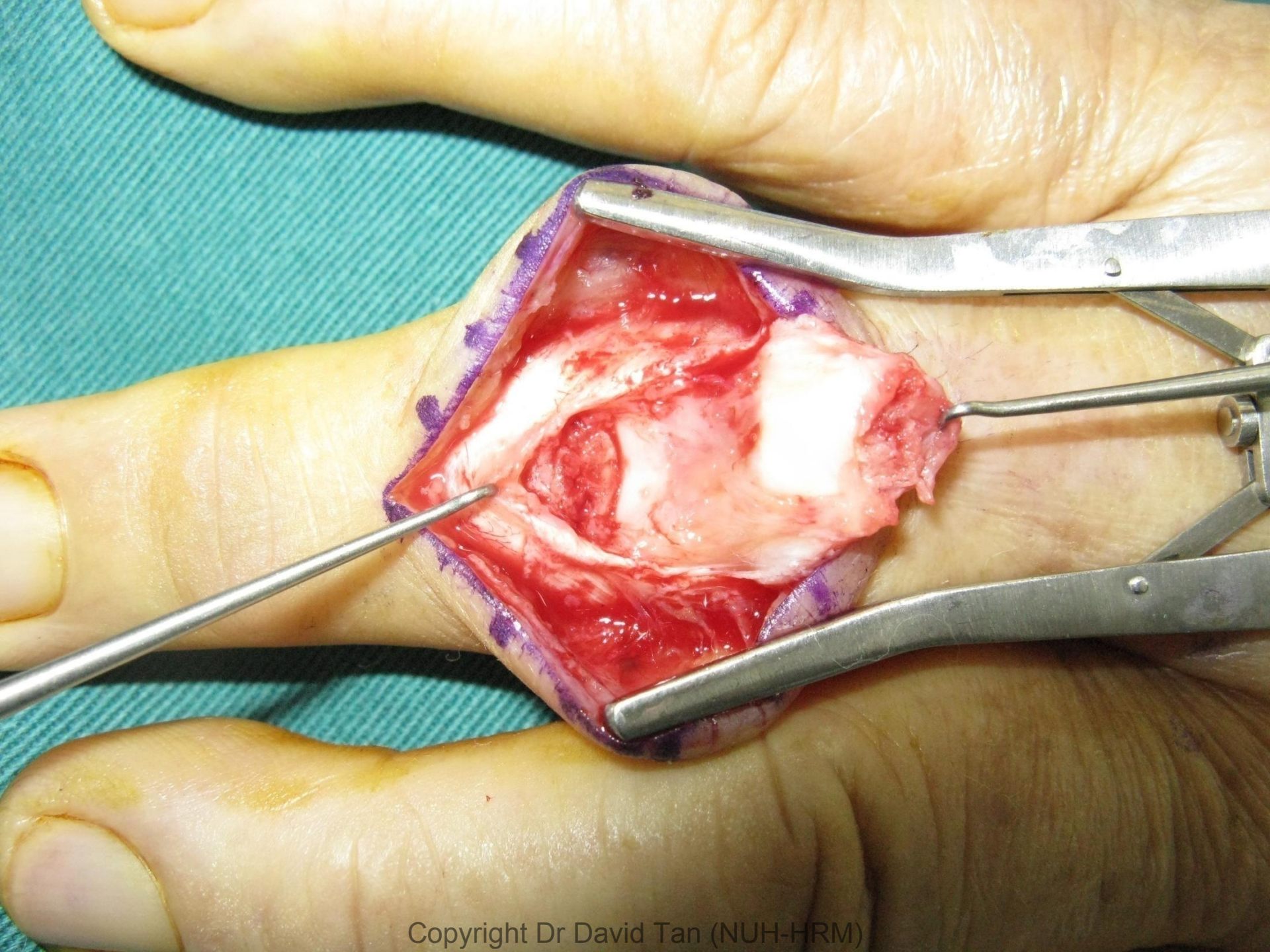
Trapeziometacarpal Joint OA
(Basal Joint Arthritis) (RM)

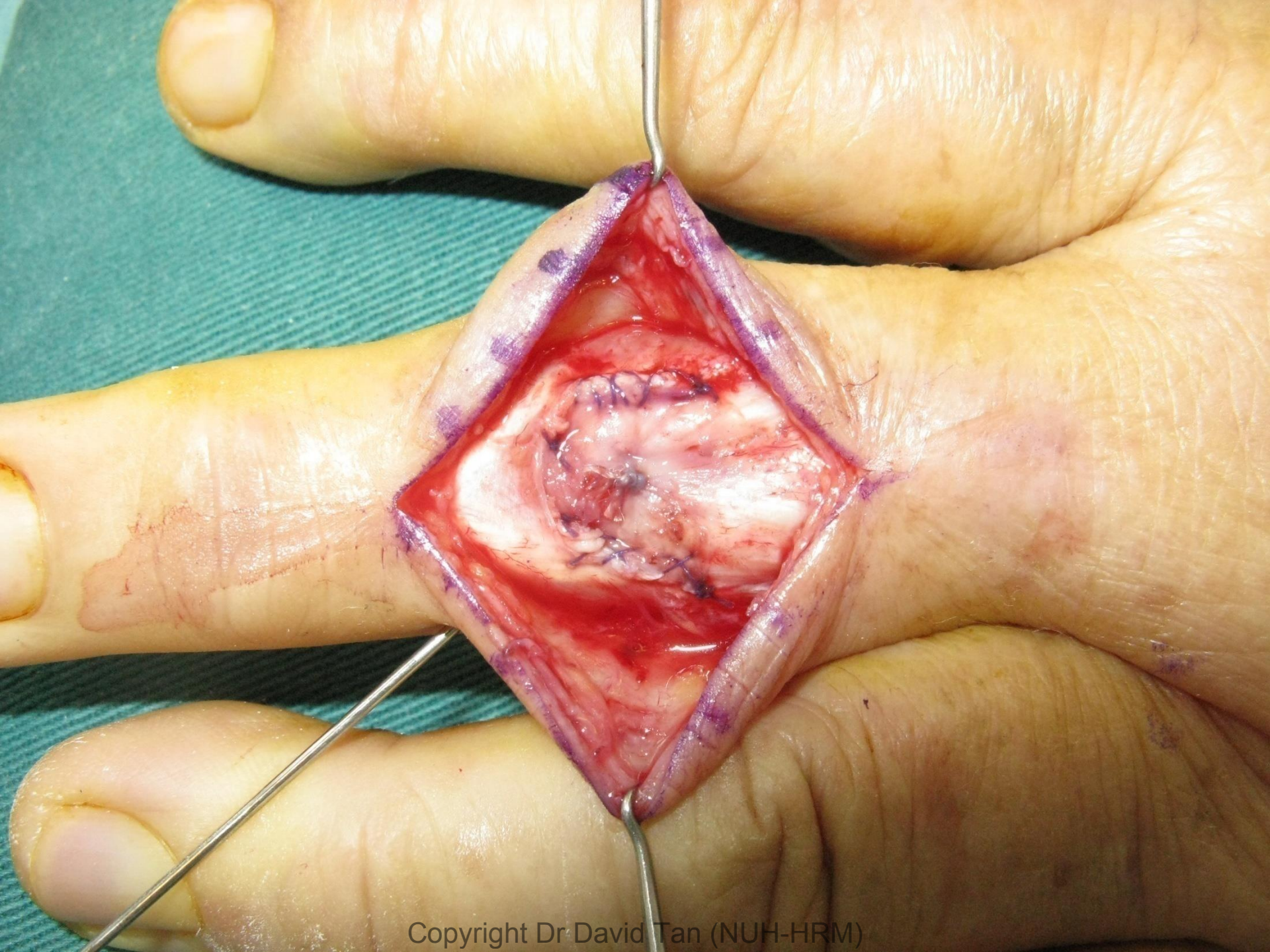
Abnormal digital postures

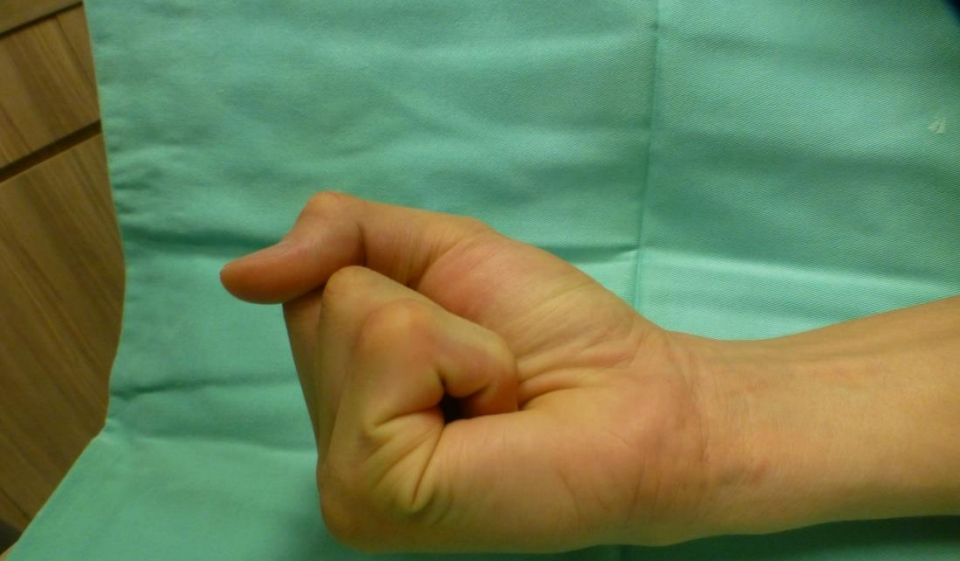
Boutonniere deformity
(central extensor slip disruption)







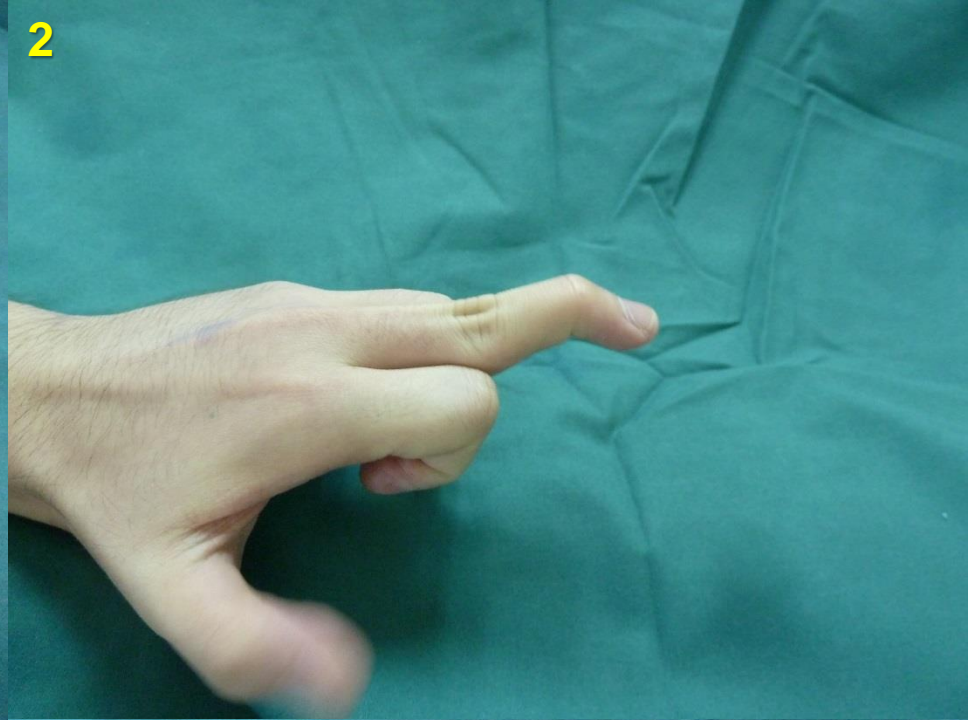




Passive motion > Active Motion = Tendon Dysfunction
(Boutonniere: central slip disruption)



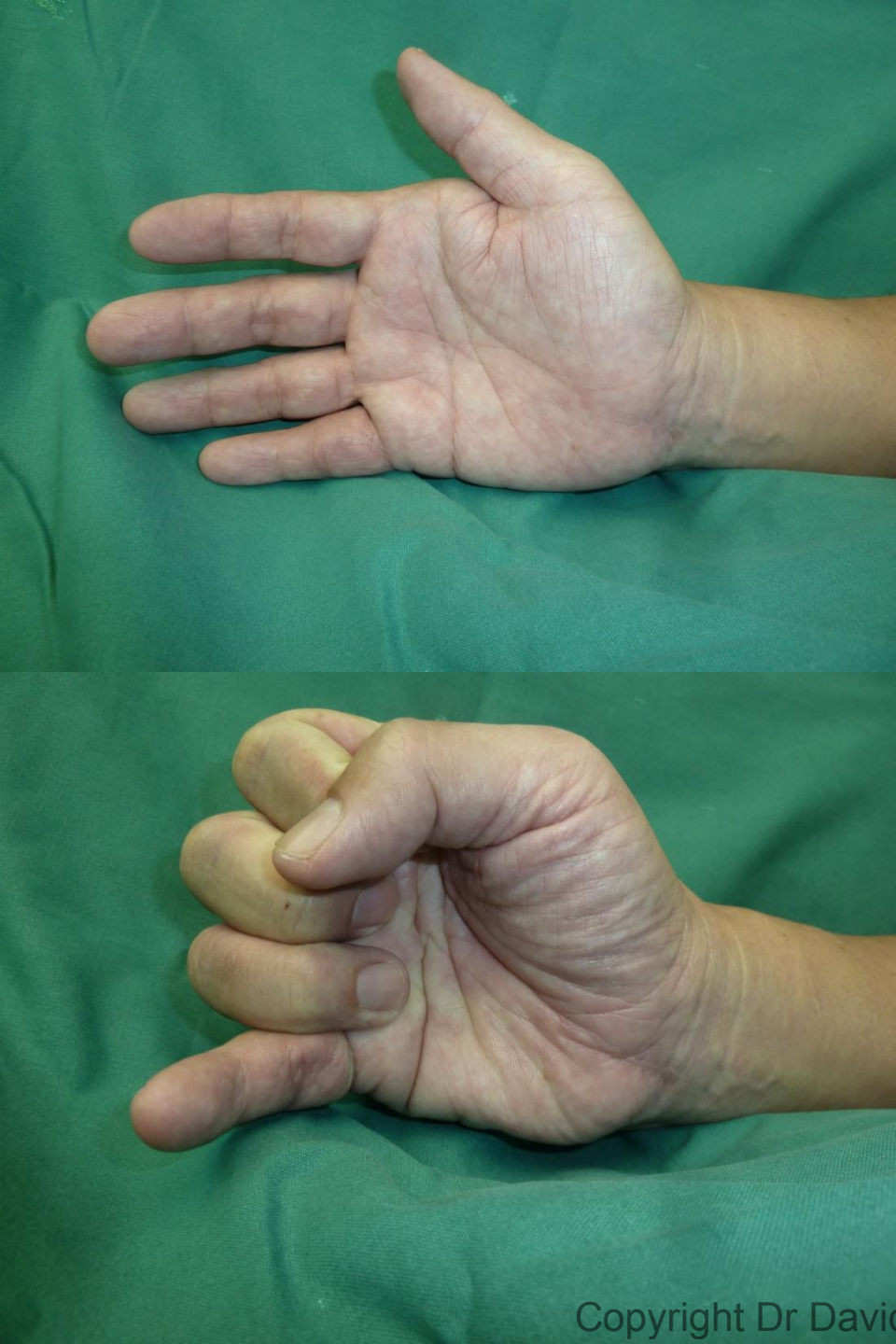
Elson's test
(Boutonniere: central slip disruption)



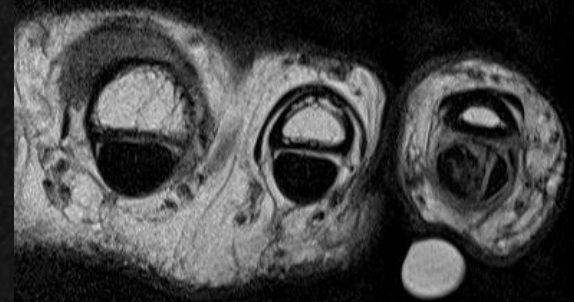
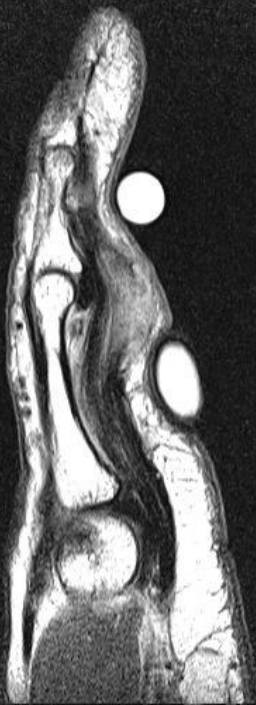
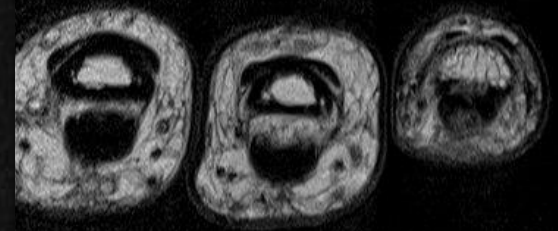
Swan Neck Deformities
(May limit PIP motion)

Motion Deficits

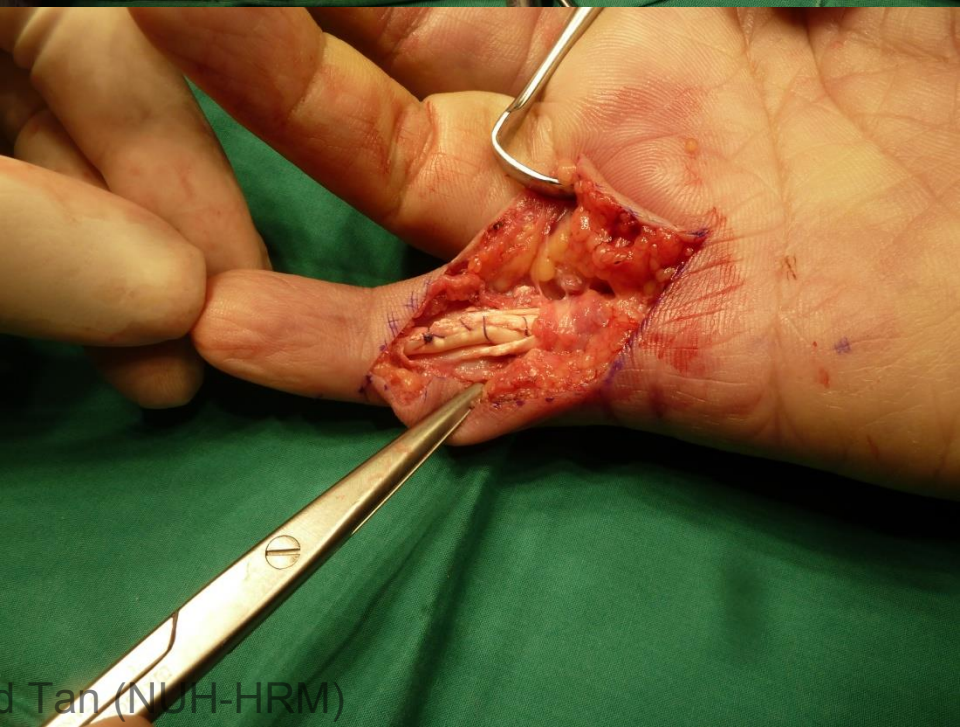
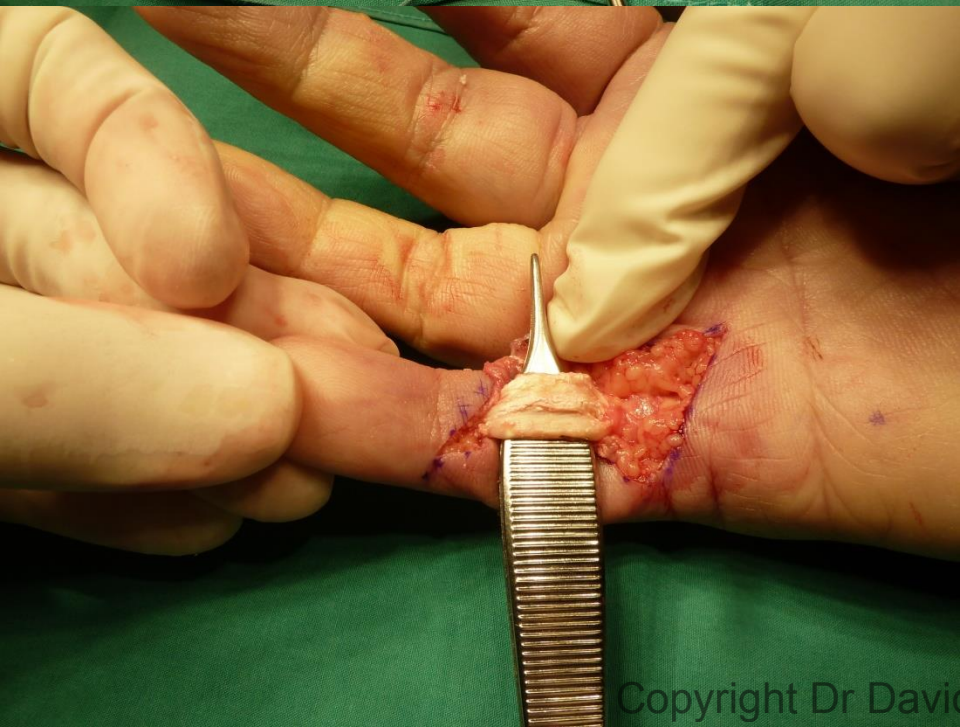
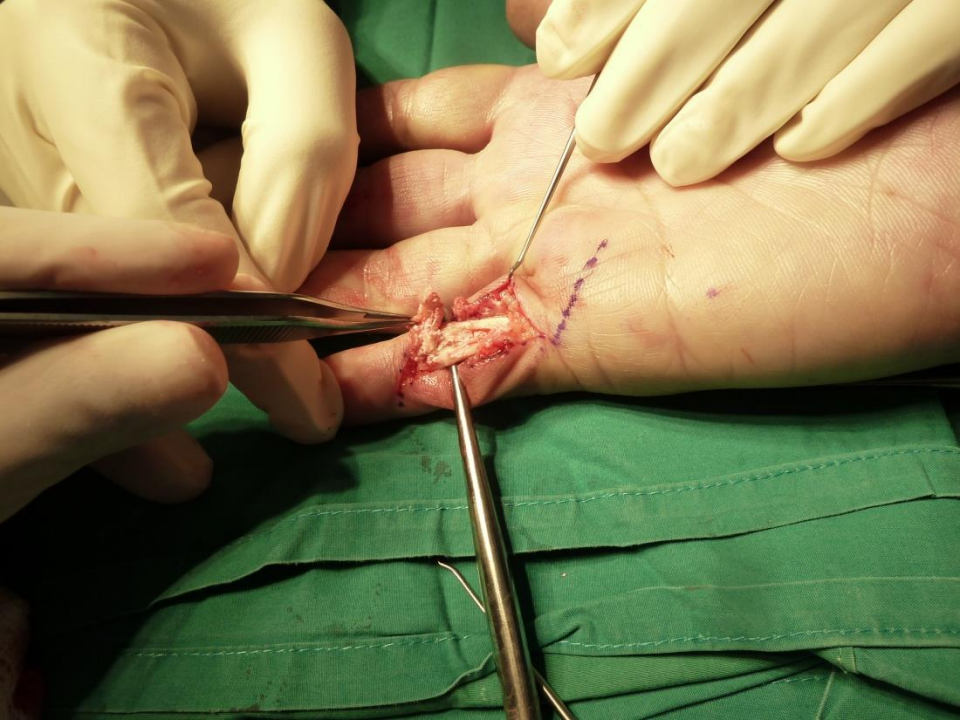
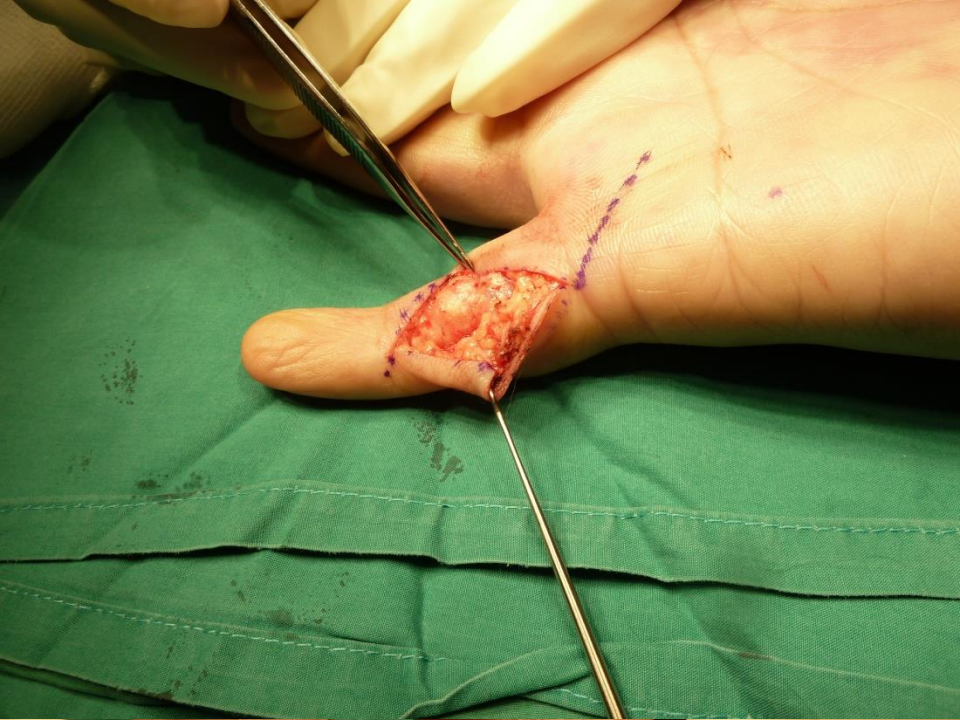
Full, symmetric, fluid and painless?







Extra-articular gout
(Flexor tendon infiltration)







Gouty arthritis of PIPJ

(Typical juxtra-articular erosions)







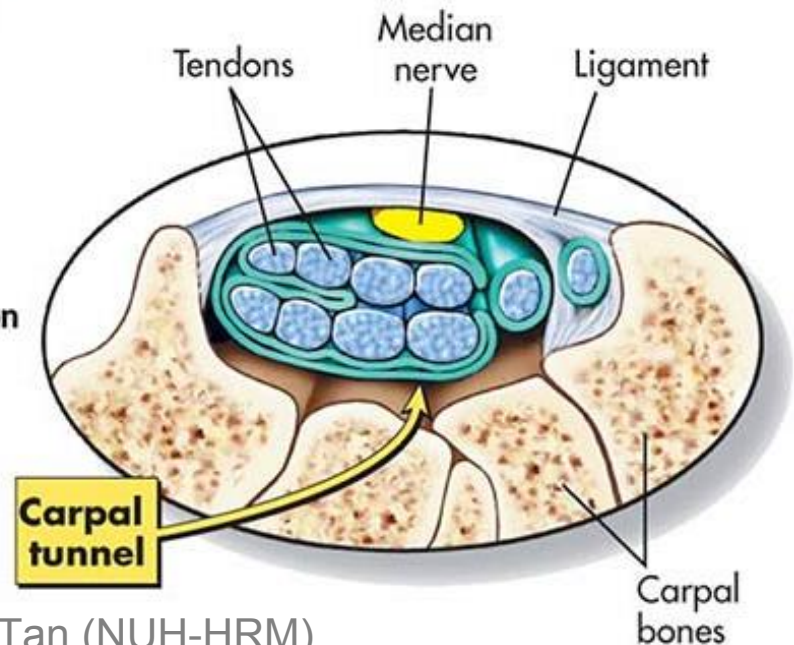
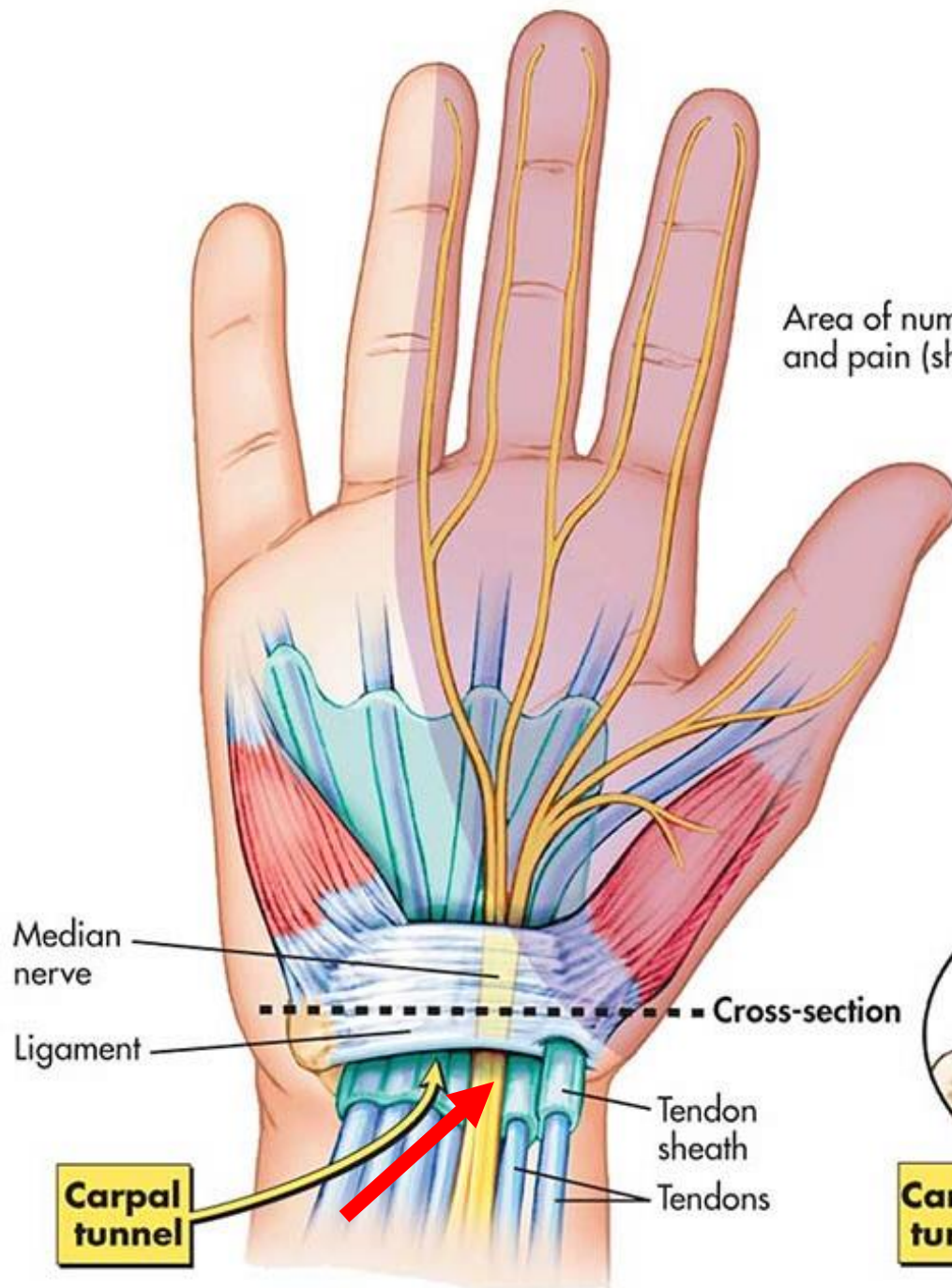


Specific Hand Conditions

Carpal Tunnel Syndrome

Carpal tunnel syndrome:

- Compression of the median nerve in the carpal tunnel
- Carpal tunnel is a confined space in the wrist bound by ligaments and bones
- Results in neurological signs and symptoms related to the function of the median nerve



Presentation

- Numbness in radial 3 ½ digits, intermittent-constant
- Nocturnal paresthaesias
- Occasional painful
- Weakness and loss of fine motor dexterity when advanced

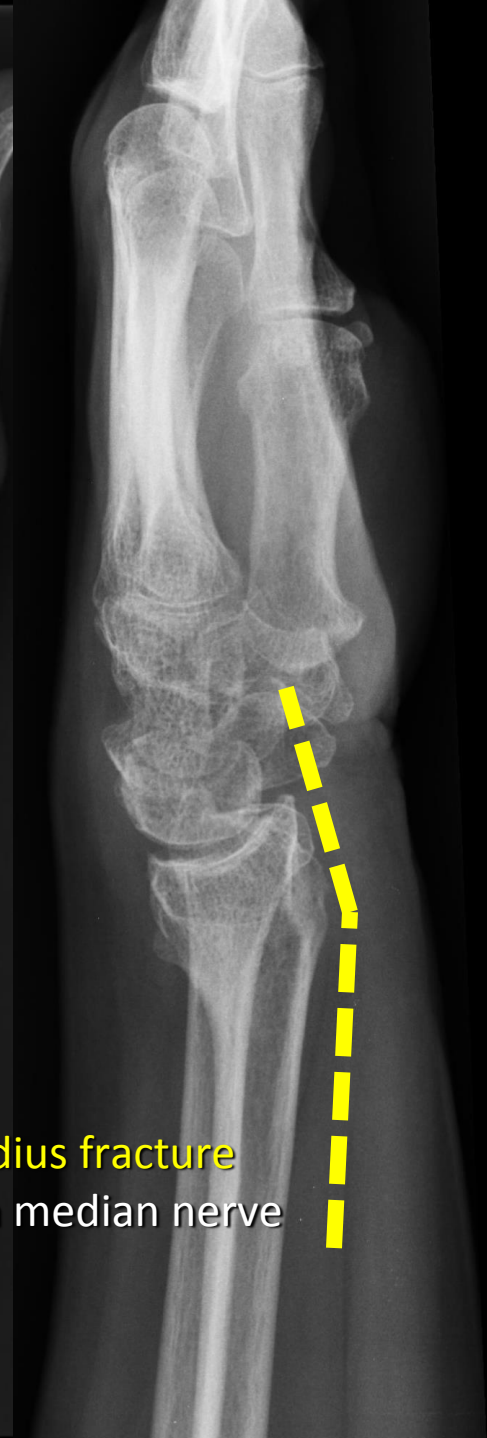
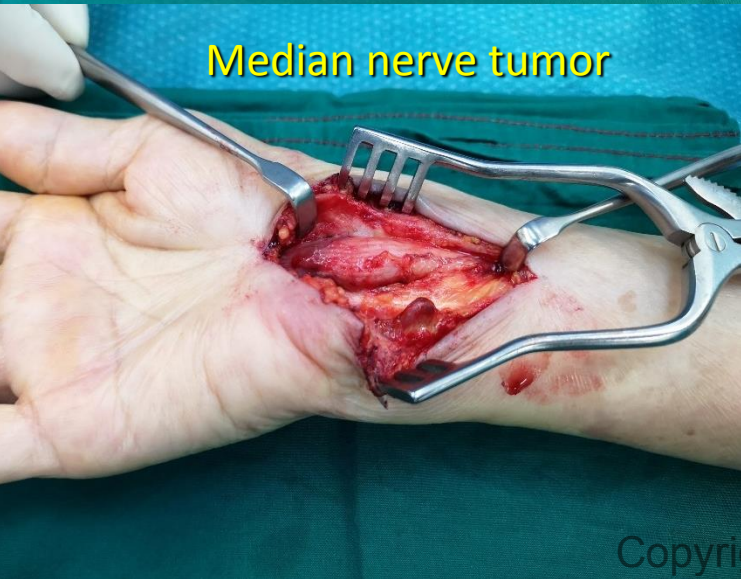
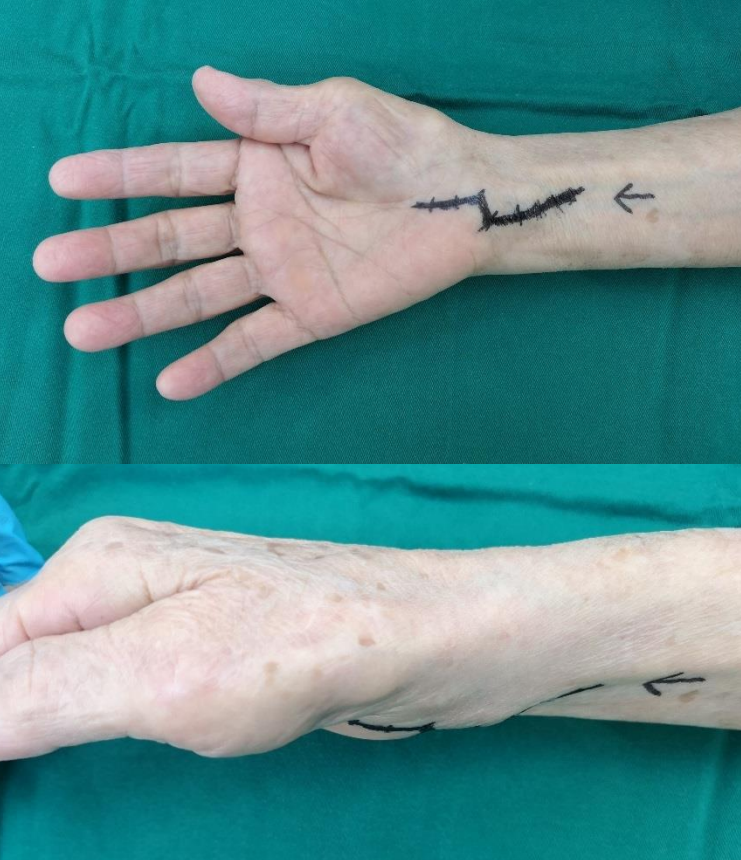


Epidemiology

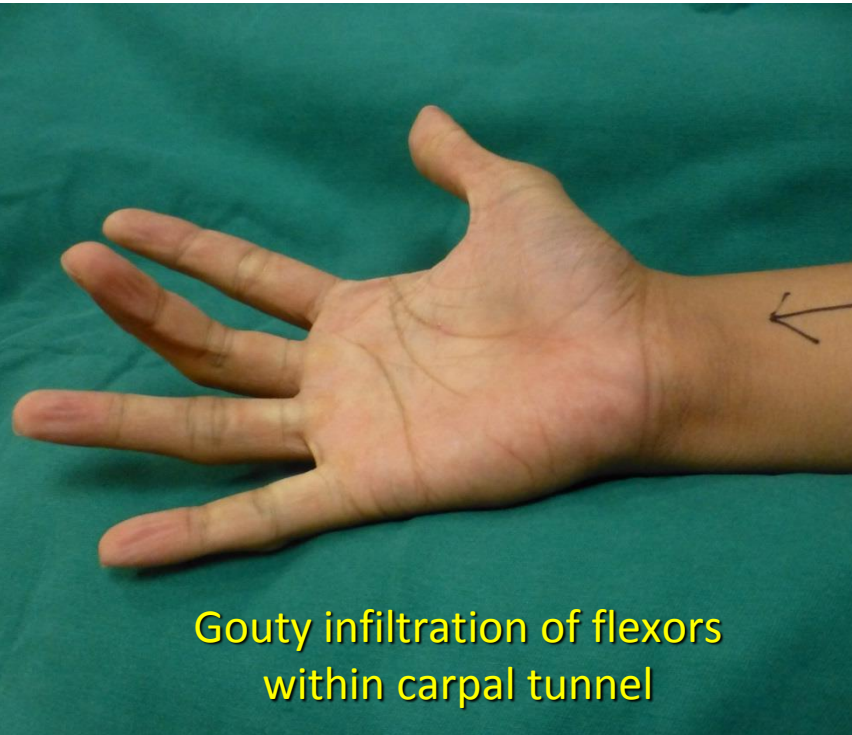
- Incidence estimated at 0.125% to 5.8% of population
- Accounts for 90% of nerve entrapment neuropathy
- Together with cervical spondylosis/radiculopathy – most common two causes of numbness in the upper limb
- CTS release most common operation in the hand

Causes of carpal tunnel syndrome

- Primary (most common)
 - idiopathic; most common, TCL thickened, middle aged-elderly patient, female
- Secondary (many)
 - Alteration of fluid balance (pregnancy, renal failure)
 - Inflammatory conditions (gout, RA, infection)
 - Space occupying lesions (tumors, ganglions)
 - Increase susceptibility of nerve (diabetes, double crush)
 - Extrinsic changes of carpal tunnel (distal radius fractures, distal radius malunion, wrist dislocations)
 - Repetitive wrist and finger flexion (clerical workers/manual workers)



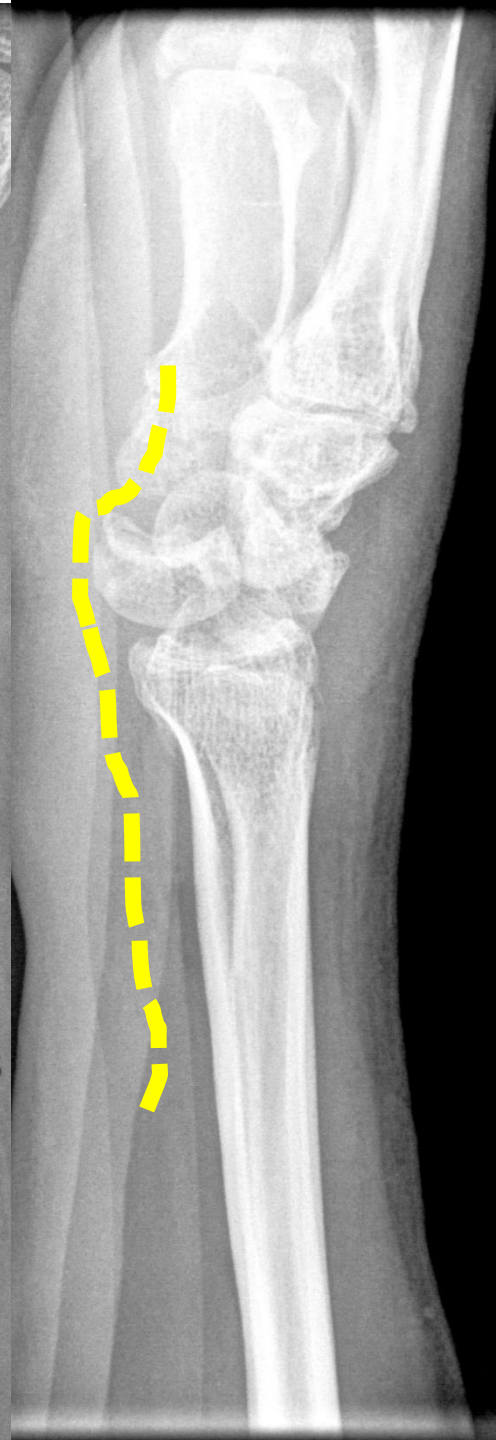
Malunited distal radius fracture
Increased pressure on median nerve



Gouty infiltration of flexors within carpal tunnel



Wrist dislocations



Natural History

- Kaplan JHSB 1990
 - Predictive factors in conservative mx of CTS
 - 331 hands, mx conserv initially, Successful in 18%
- Poor prognositc factors
 - >50 yrs
 - Duration symptoms > 10 mths
 - Constant parasthesia
 - Stenosing flexor tenosynovitis
 - Phalen's test + < 30 s

Natural History

- Non surgical mx success
 - No risk factor, 65%
 - 1 risk factor, 41%
 - 2 risk factors 16.7%
 - 3 risk factors 6.8%
 - 4 or >, 0%

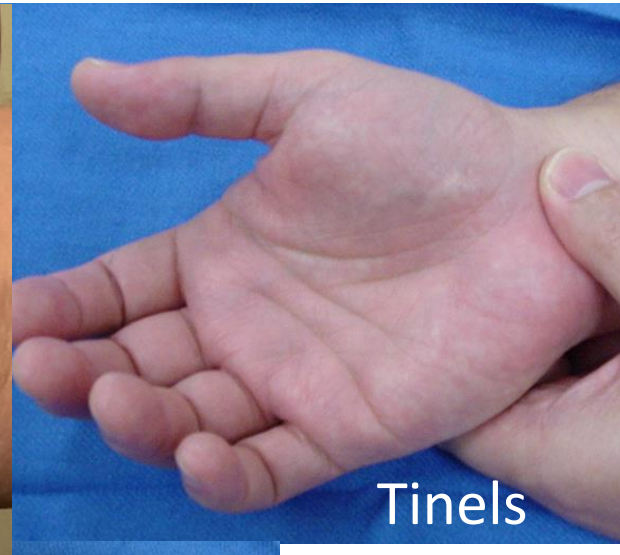
Carpal tunnel syndrome -Clinical Tests



Phalen's



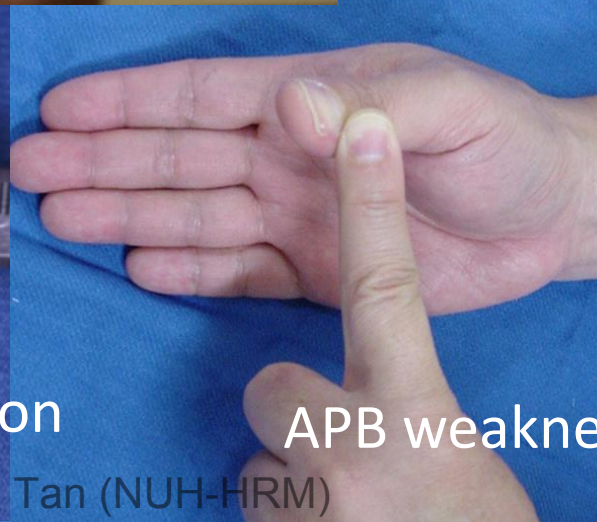
Durkan's carpal
compression



Tinels



2 Points Discrimination



APB weakness

Treatment

- NCS helpful
- Mild/intermittent: splints, nerve gliding exercises
- Early/moderate: trial of steroid injections
- Surgery: for moderate and progressing, secondary causes cannot be medically controlled



Conclusions

- Assessment of hand and wrist starts with good history and examination
- Each component of clinical examination important
- Follow through on findings with provocative tests

Thank you