The Triangular Fibrocartilage Complex

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The Game Plan

- Importance
- Function
- Anatomy
- Clinical History
- Palmer Classification of TFCC injuries
- Treatment
- Imaging
  - Types
  - Review of literature
- Cases

TFCC Importance

- Previously, pts with pain related to TFCC underwent excision of TFC or of DRUJ

- Expanded knowledge of the TFCC
  - Histology
  - Imaging techniques
  - Arthroscopic Techniques

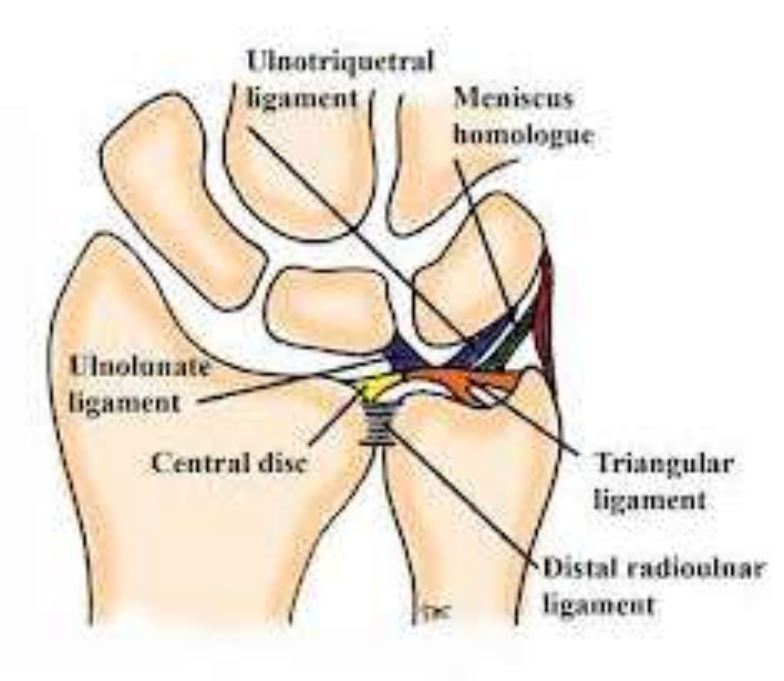
Palmer (1990)

TFCC Function

- Most important function
  - Stabilizer of the DRUJ
- Stabilizes the ulnar carpus
- Cushion
- Distributes stresses from ulnar carpus to ulna
  - Carries 20% of axial load across the wrist in the neutral position

TFCC Anatomy

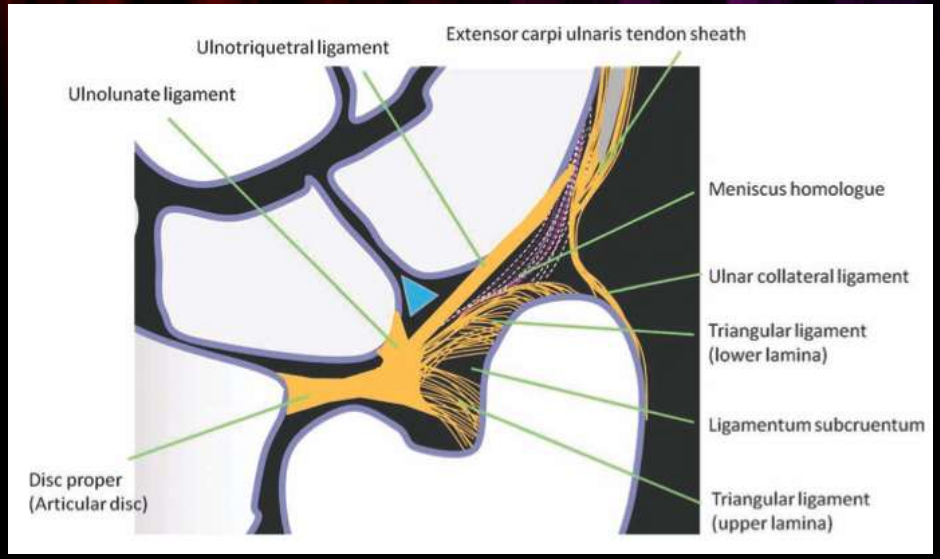
- A complex composed of a fibrocartilaginous disc & multiple interlinked ligamentous structures



http://www.rearmyourselftexas.com/wrist/triangular-fibrocartilage-tear/

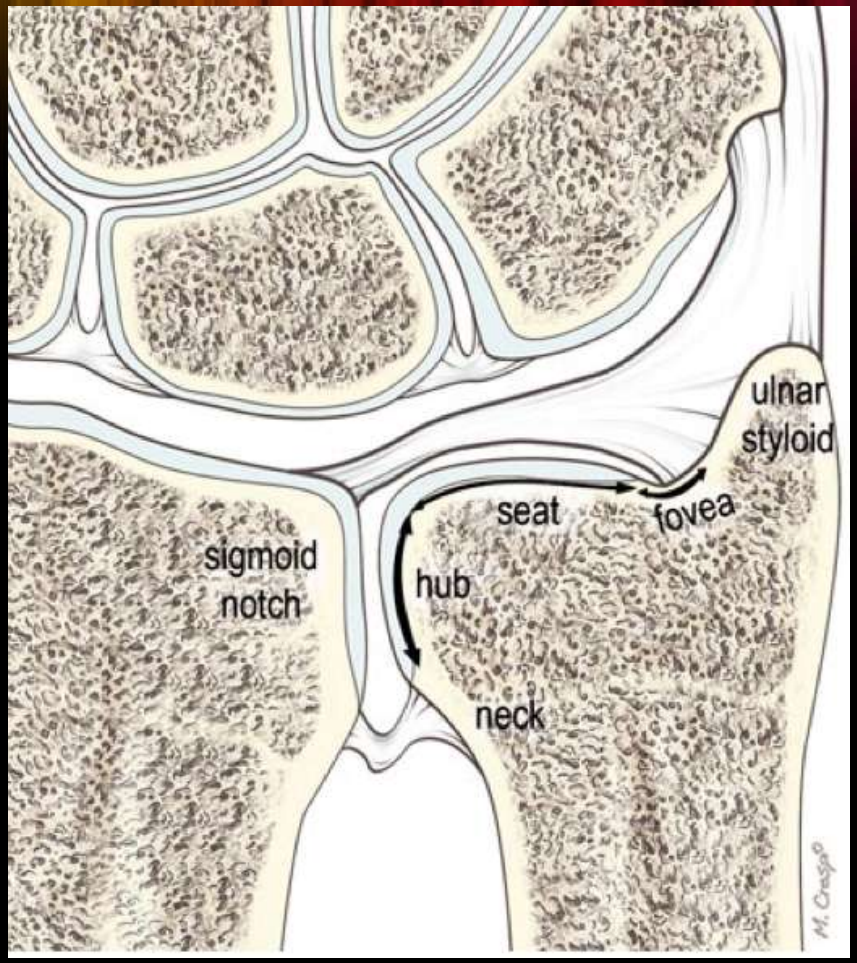
Anatomy

1. Triangular fibrocartilage
2. Triangular ligament*
3. Dorsal radioulnar ligaments
4. Volar radioulnar ligaments
5. Meniscus homologue
6. Ulnar collateral ligament *
7. Subsheath of the Extensor Carpi Ulnaris tendon
8. Ulnolunate ligaments
9. Ulnotriquetral ligaments

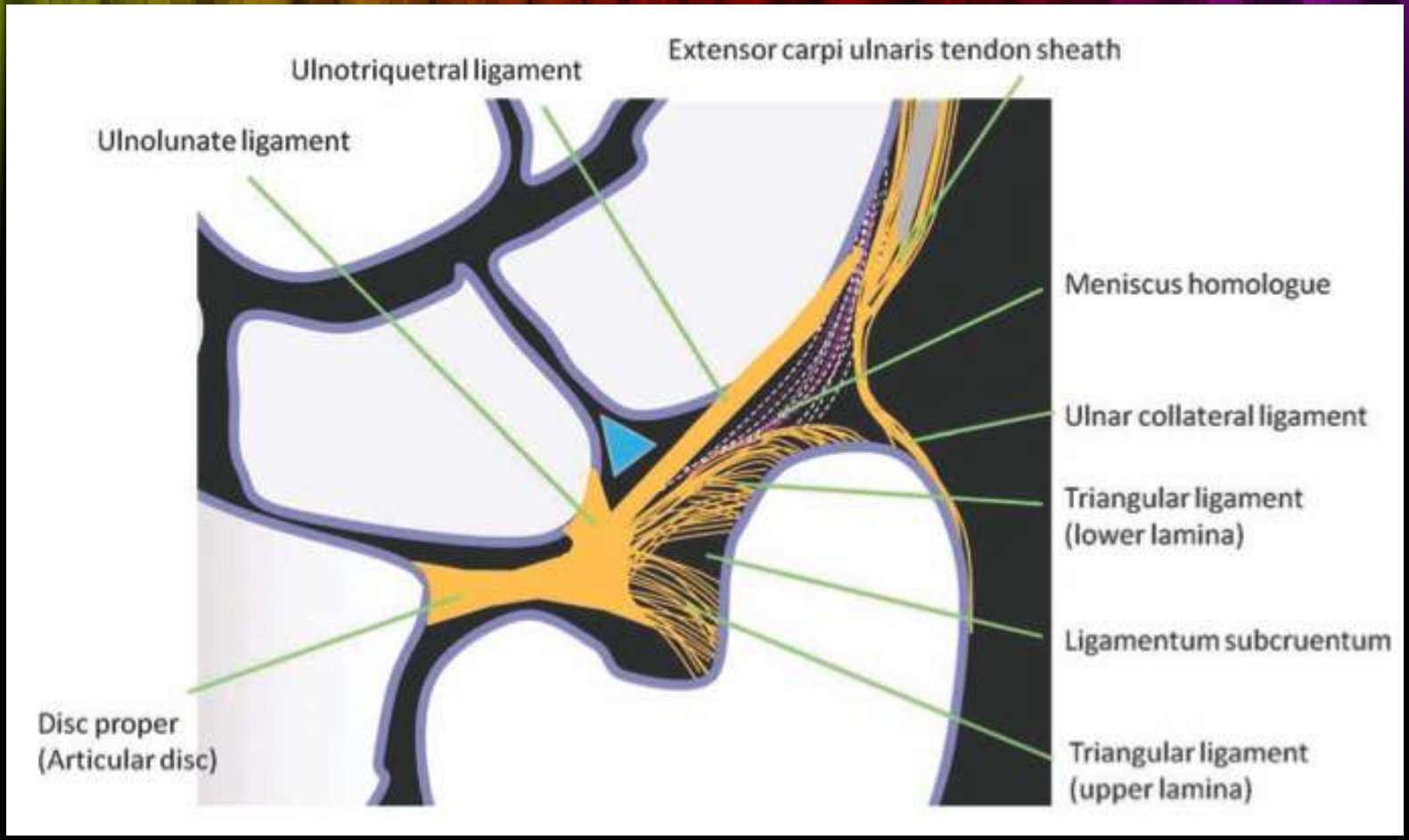


Yoshioka et. al (2012)

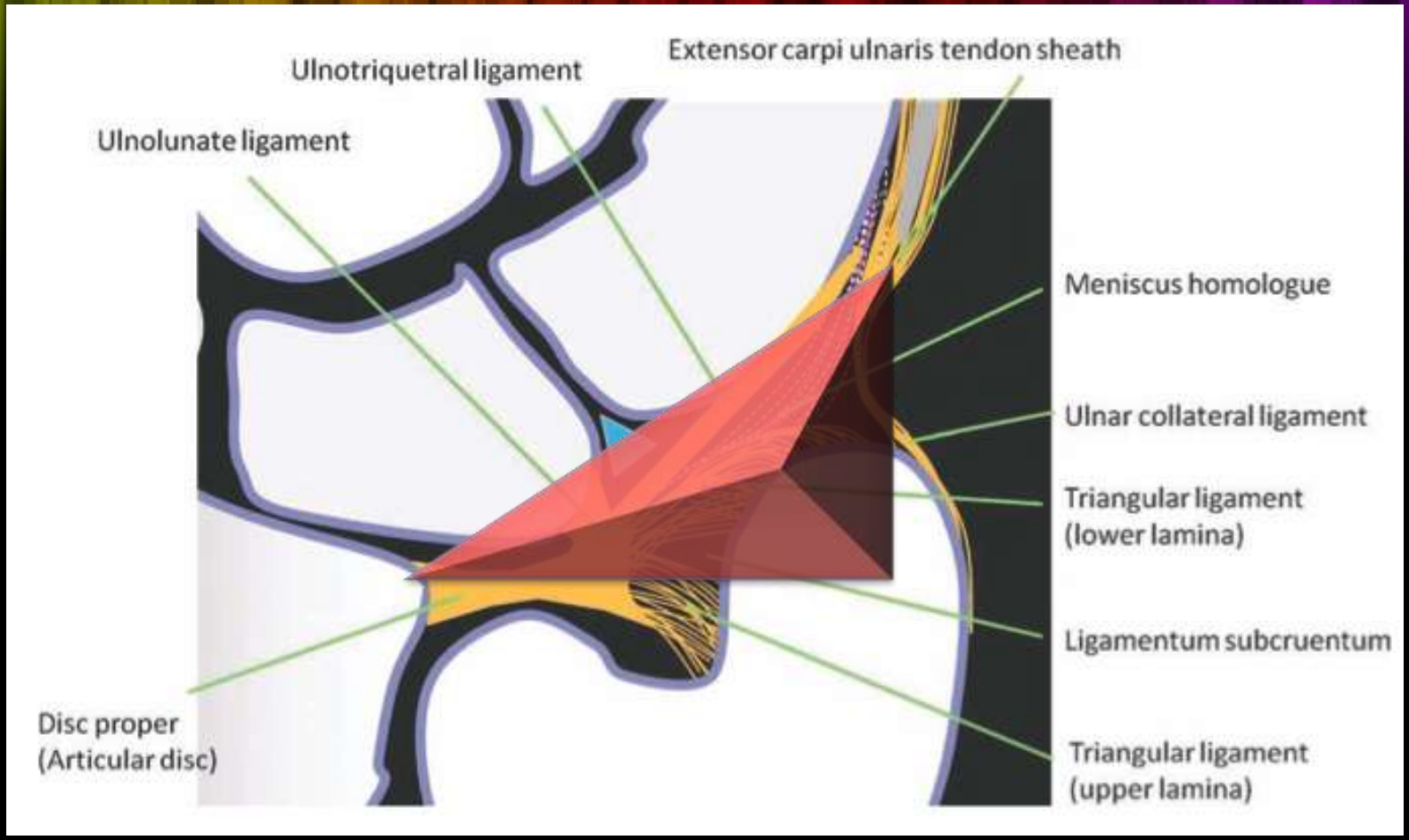
Distal Radius & Ulna Anatomy



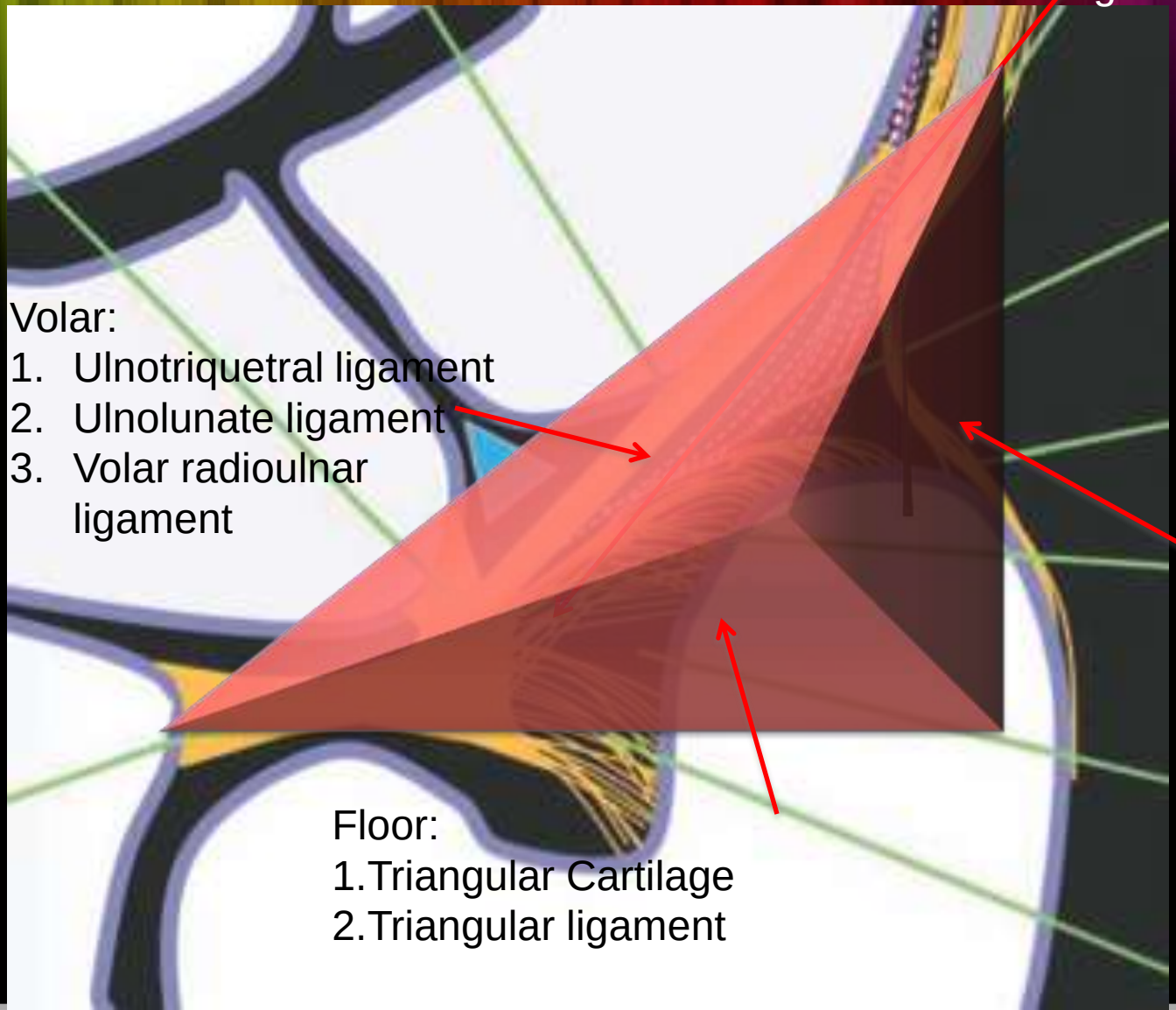
TFCC



TFCC



TFCC



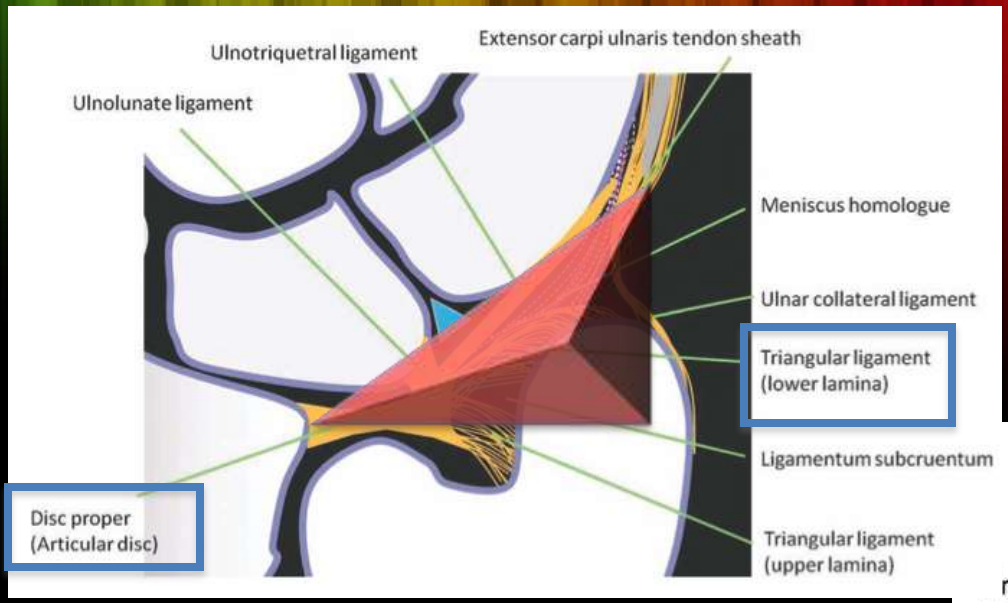
Dorsal:
1.Dorsal radioulnar ligament

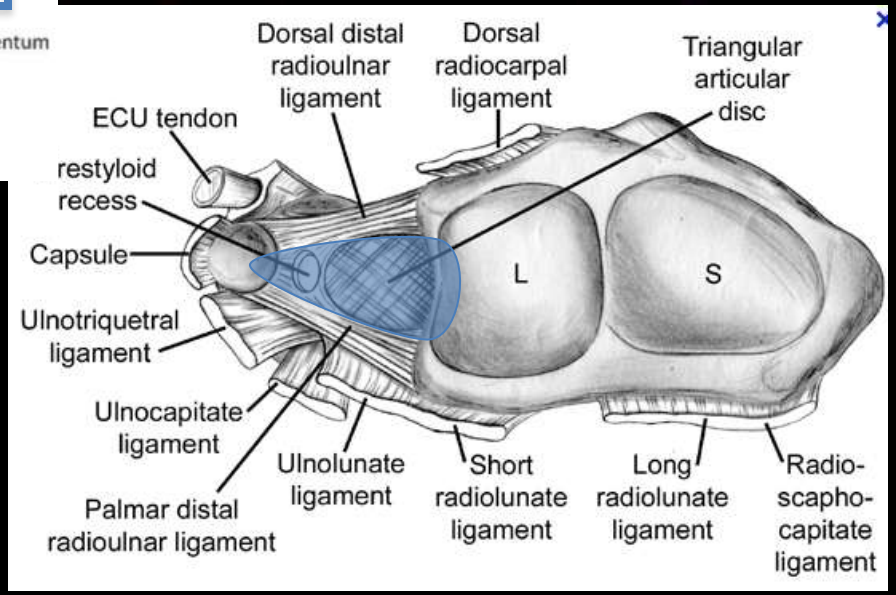
Volar:
1. Ulnotriquetral ligament
2. Ulnolunate ligament
3. Volar radioulnar ligament

Ulnar:
1.Meniscus homolog
2.UCL (ulnar capsule)
3.ECU subsheath

Floor:
1.Triangular Cartilage
2.Triangular ligament

Floor

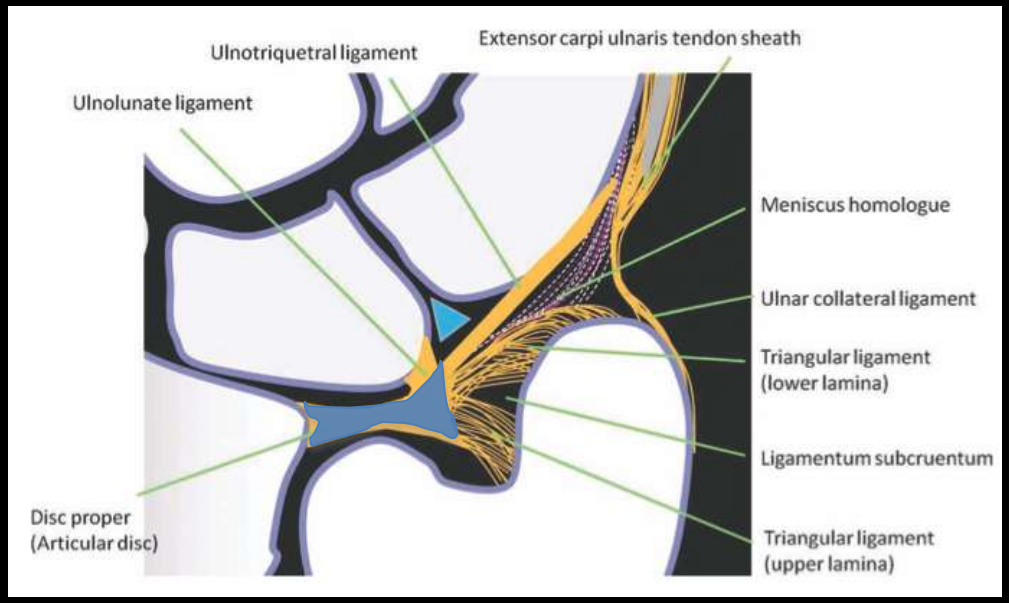




Hand Surgery. 2004. Richard A. Berger, Arnold-Peter C. Weiss. Lippincott Williams & Wilkins.

Triangular Fibrocartilage

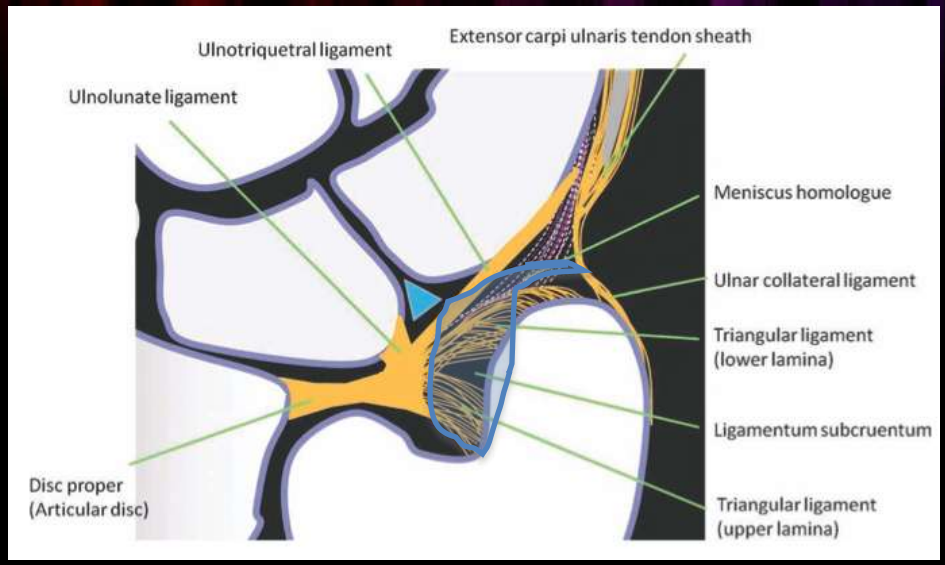
- AKA: Articular Disc, Central portion, Horizontal portion
- Attachment: Sigmoid Notch of radius, triangular ligament, volar and dorsal radioulnar ligaments
- Broad based, continuous transition from the disc to the hyaline cartilage of radius
  - intermediate signal intensity



Burns, et al. (2011)

Triangular Ligament

- Attachments: articular disk
  - Usually bifurcates into 2 laminae
    - Proximal attaches to the fovea of ulna
    - Distal to tip of ulnar styloid (occurs variably)



Yoshioka et. al (2012)

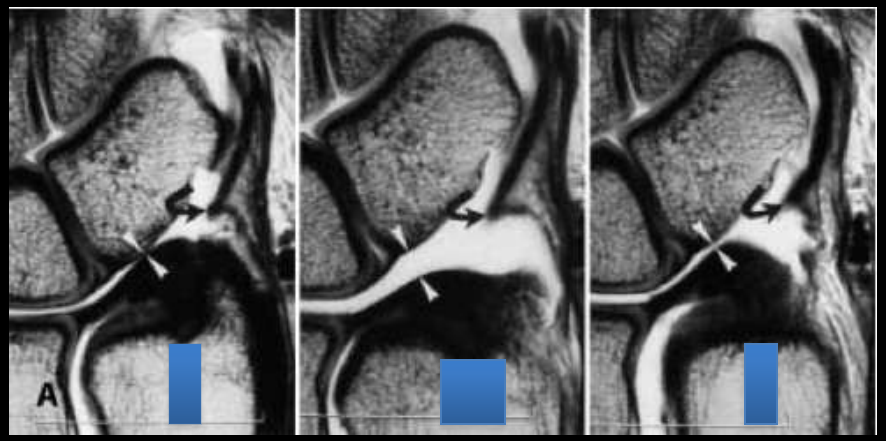
Triangular Ligament

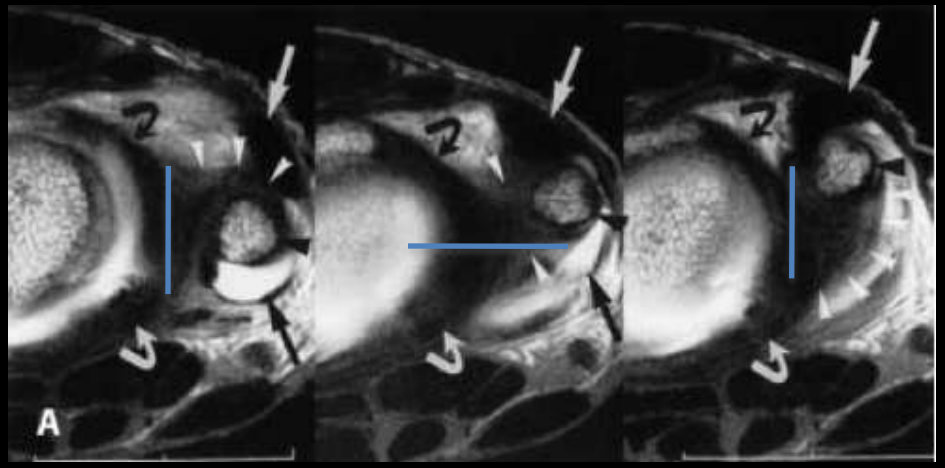
- Inc signal with a striated pattern
  - Vascular loose knit connective tissue with bundles of collagen fibers
- Proximal lamina
  - Fibers are denser and rise vertically
- Distal lamina
  - Horizontally oriented and extend from cartilage of styloid tip
- Ligamentum subcruentum
  - In between the lamina
  - Increased signal due to vascular tissue

Burns, et al. (2011)

Triangular Ligament

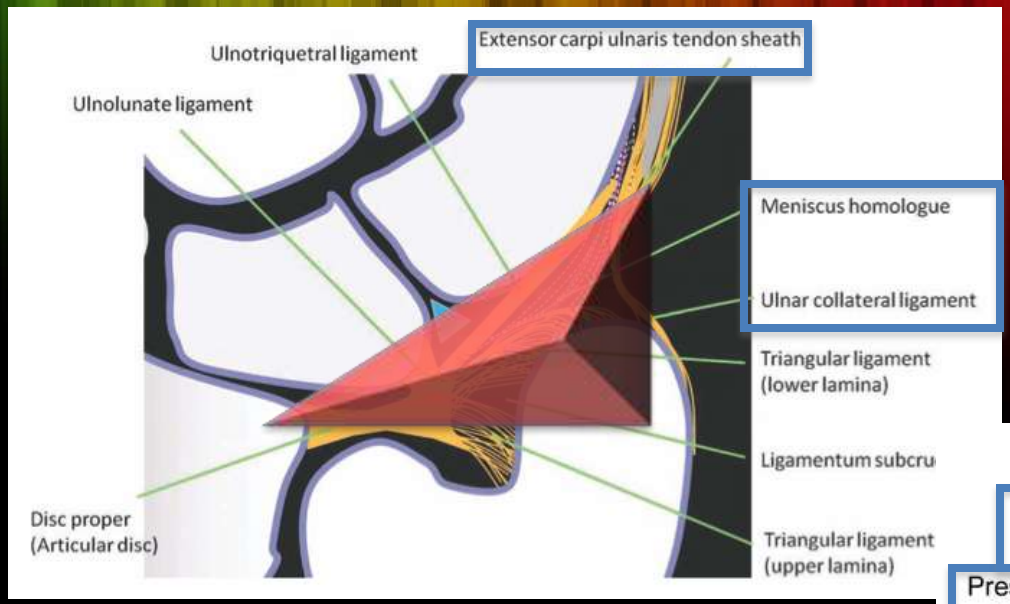
- Neutral forearm: coronal orientation
- Pronation and supination: sagital

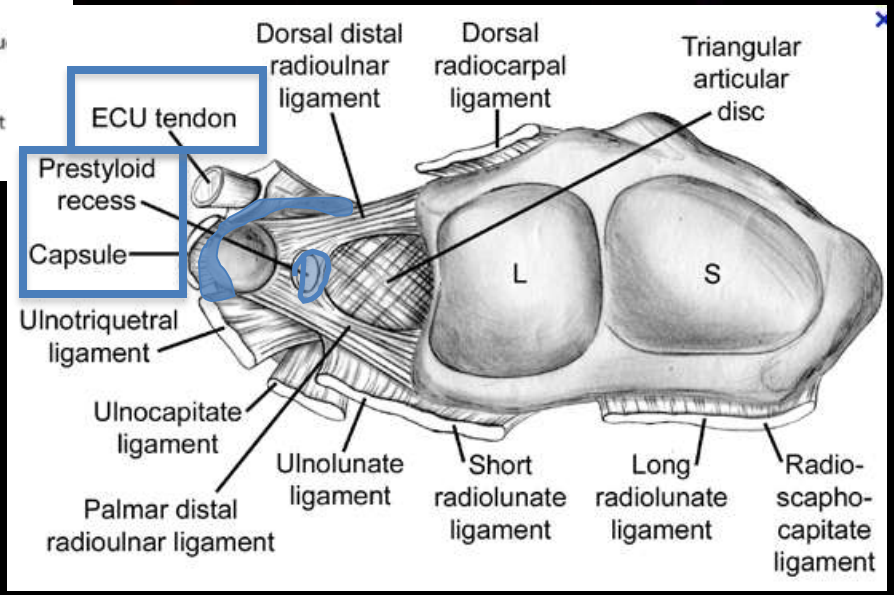




Pfirrmann et al. *(2001)*

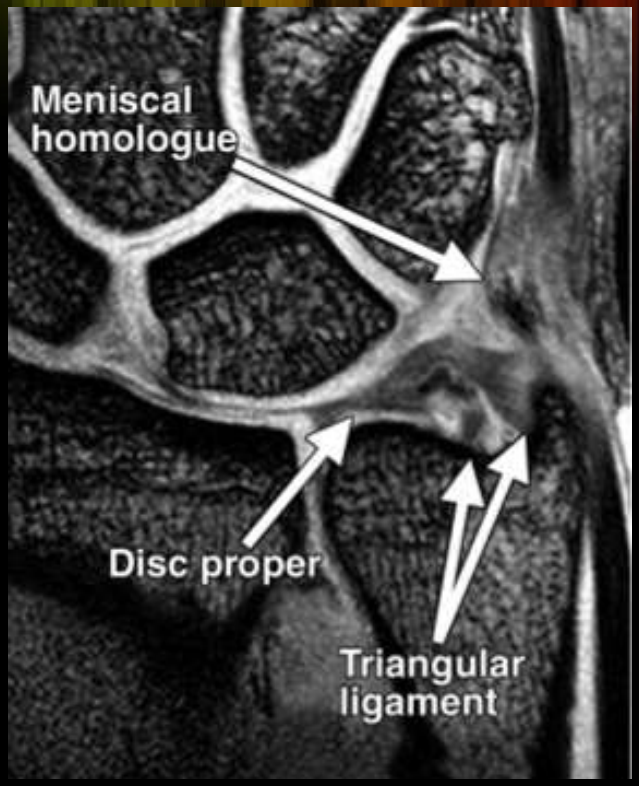
Ulnar





Hand Surgery. 2004. Richard A. Berger, Arnold-Peter C. Weiss. Lippincott Williams & Wilkins.

Meniscus Homolog

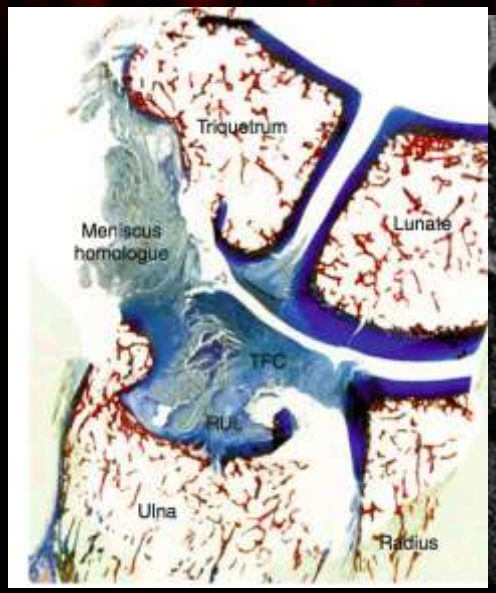


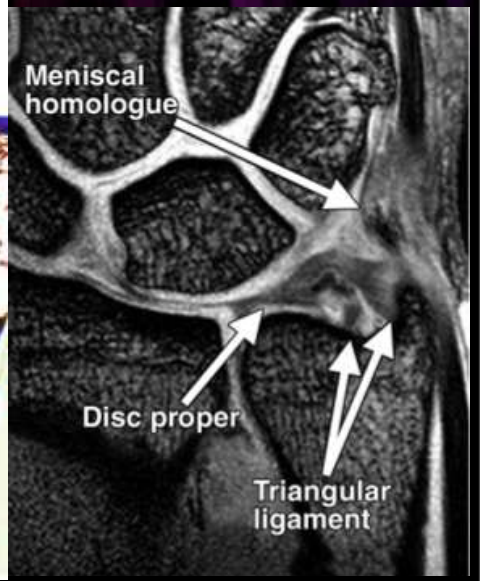
Just what is the Meniscus Homolog?!

Yoshioka et. al (2012)

Meniscus Homolog

- Ill defined region of complex, dense fibrous tissue
- “has not independent histologic identity”
- Difficult to ID on anatomic dissections
- Triangular
- Attachments: Articular disc, ulnar styloid, subsheath of ECU, UCL & triquetrum

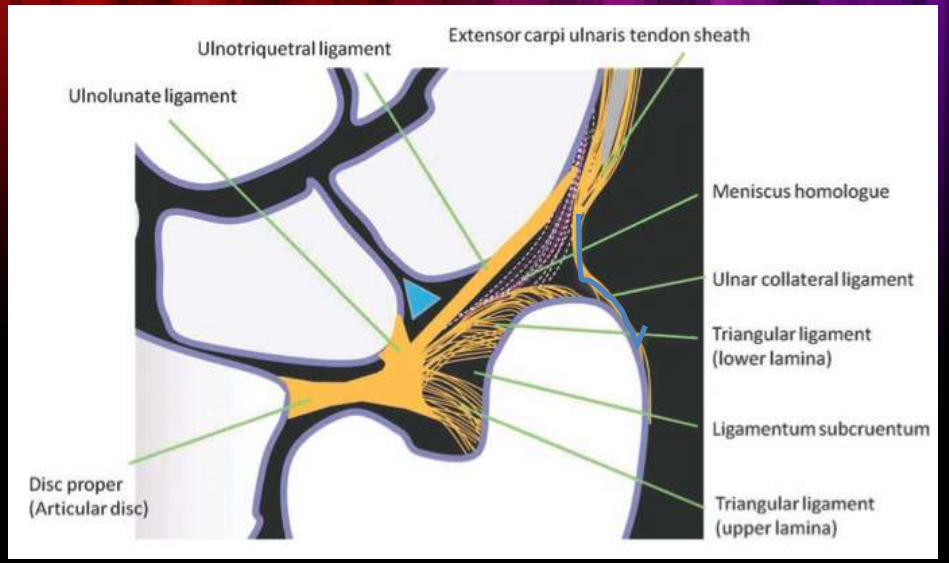


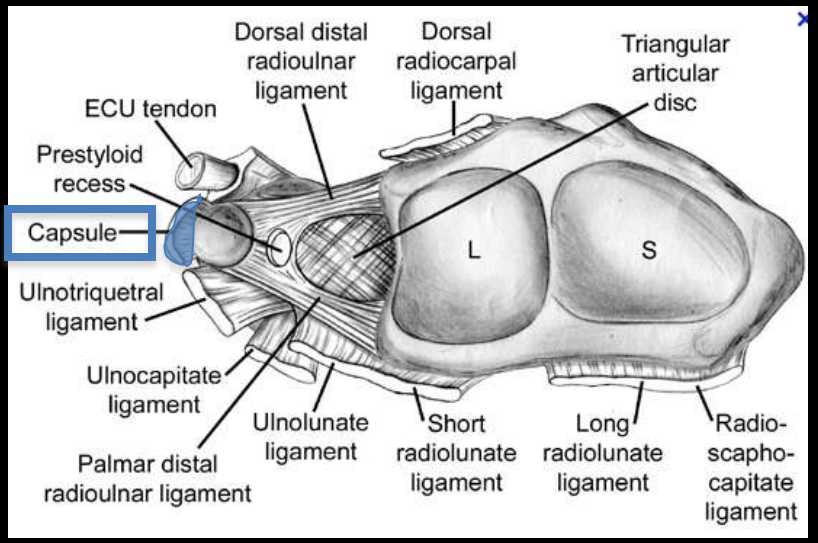


Burns, et al. (2011)

Ulnar Collateral Ligament

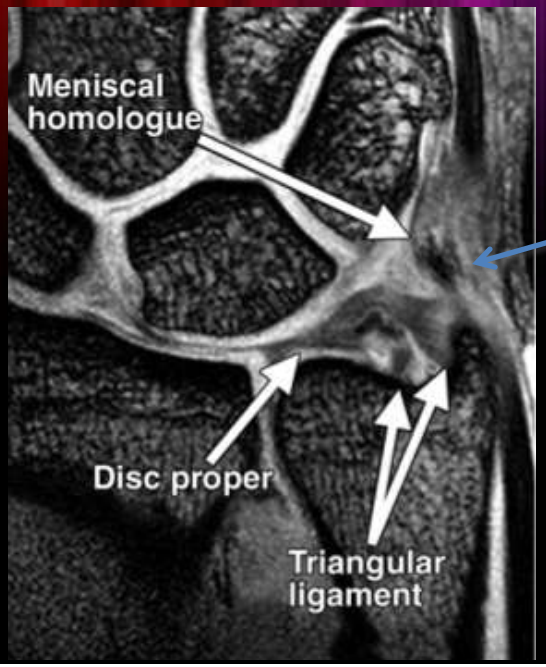
- Not enough evidence to consider this structure as a ligament – ulnar capsule
- Attachments: palmarly at the ulnar margin of ulnotriquetral ligament, ECU subsheath, triquetrum, 5th MC base

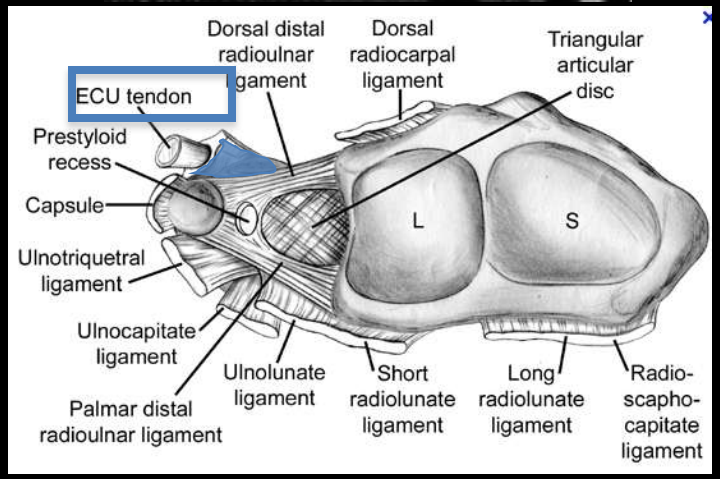




ECU Tendon Sheath

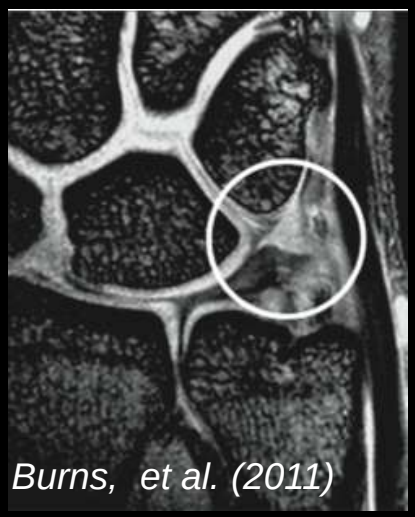
- ECU tendon subsheath fibers fuse with the dorsal-ulnar aspect of the TFCC
- Attachments: triquetrum, ulnar styloid
- More rigid and thicker than ulnar capsule
  - More important stabilizer at ulnar side of wrist





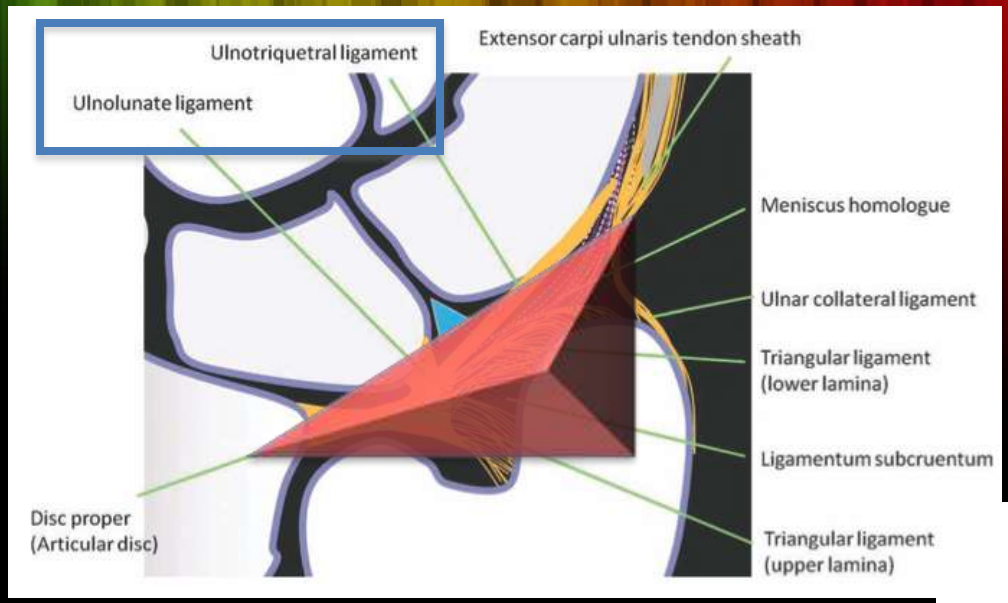
Prestyloid Recess

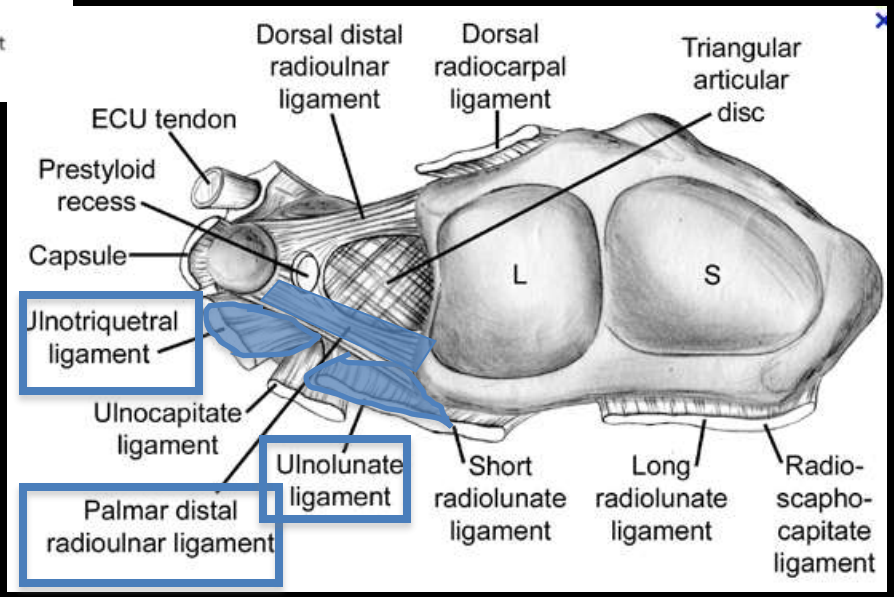
- Direct site of communication with radiocarpalcompartment (pisotriquetral joint)
  - Synovium-lined pouch between the triangular ligament and the meniscus homologue
  - Variable shape



Burns, et al. (2011)

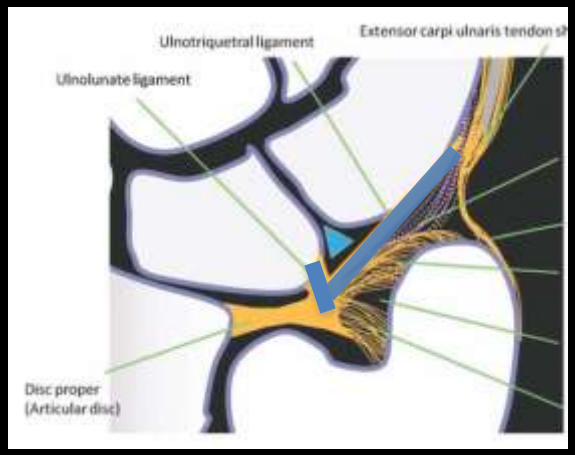
Volar



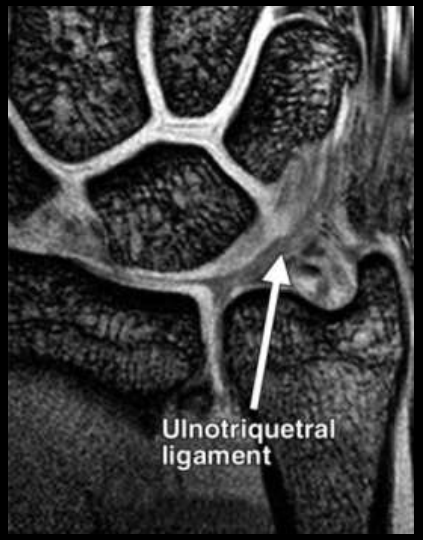


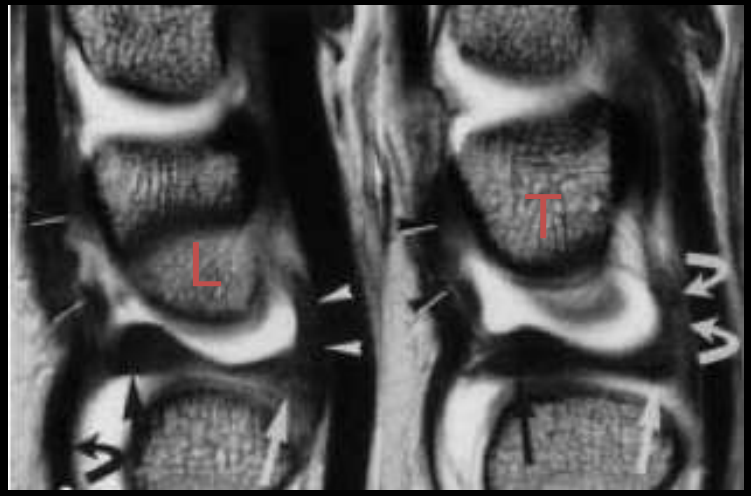
Ulnotriquetral & Ulnolunate Ligaments

- Attachments: volar articular disc and volar radioulnar ligament and not ulna itself[1]
  - Ulnolunate Lig: volar portion of lunate
  - Ulnotriquetral Lig: volar aspect of triquetrum
  - Vary in size
  - Single inhomogenous structure



Yoshioka et. al (2012)

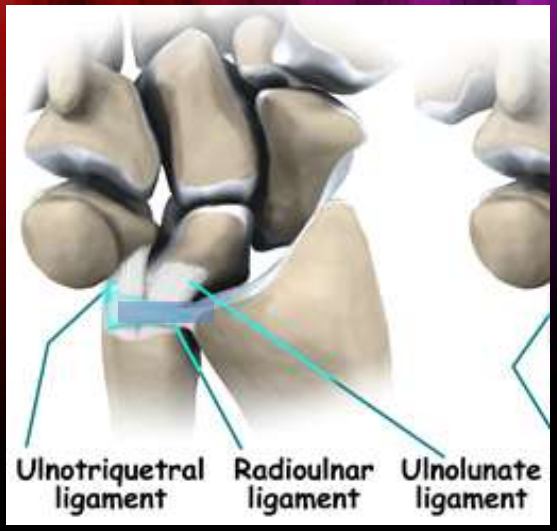




Pfirrmann et al. *(2001)*

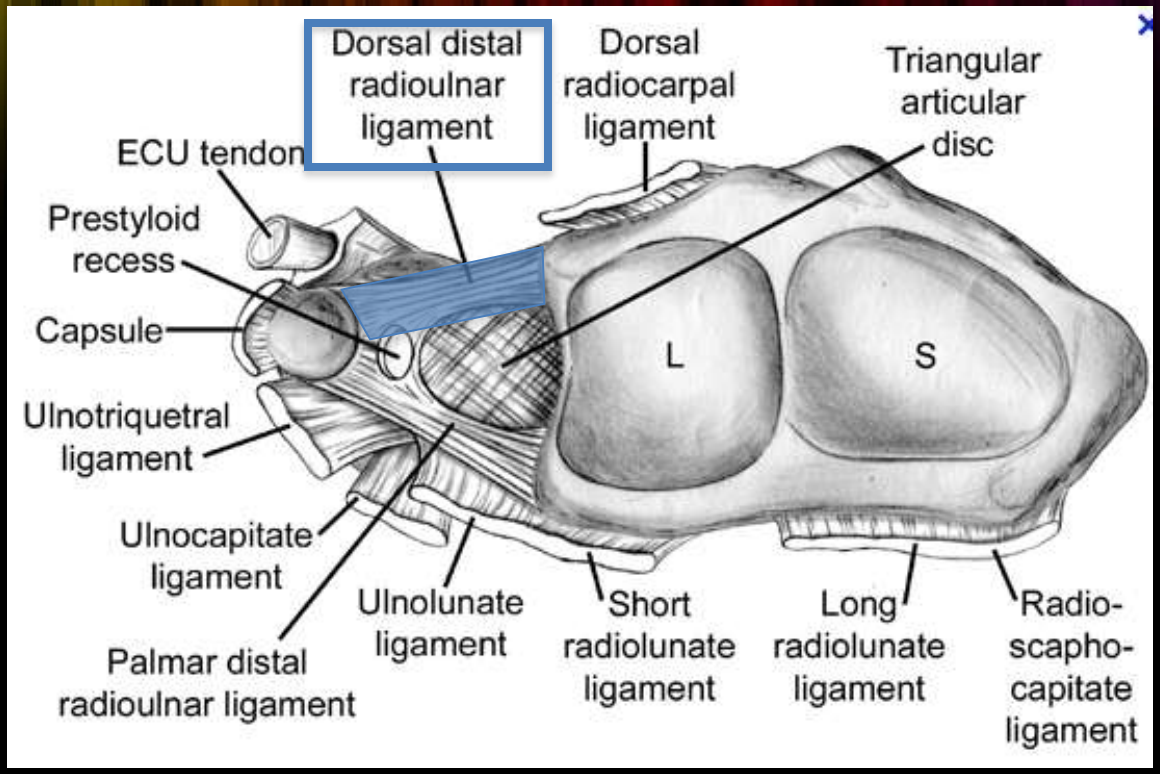
Volar Radioulnar Ligament

- Attachments: volar rim of sigmoid notch, fovea and base of ulna
- Volar periphery of the TFC
- Direct, focal osseous attachment to the sigmoid notch of the radius



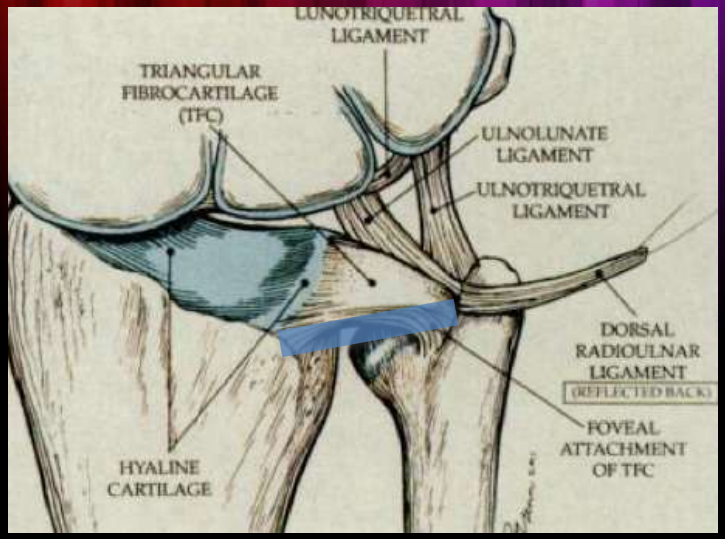
Yoshioka et. al (2012)

Dorsal

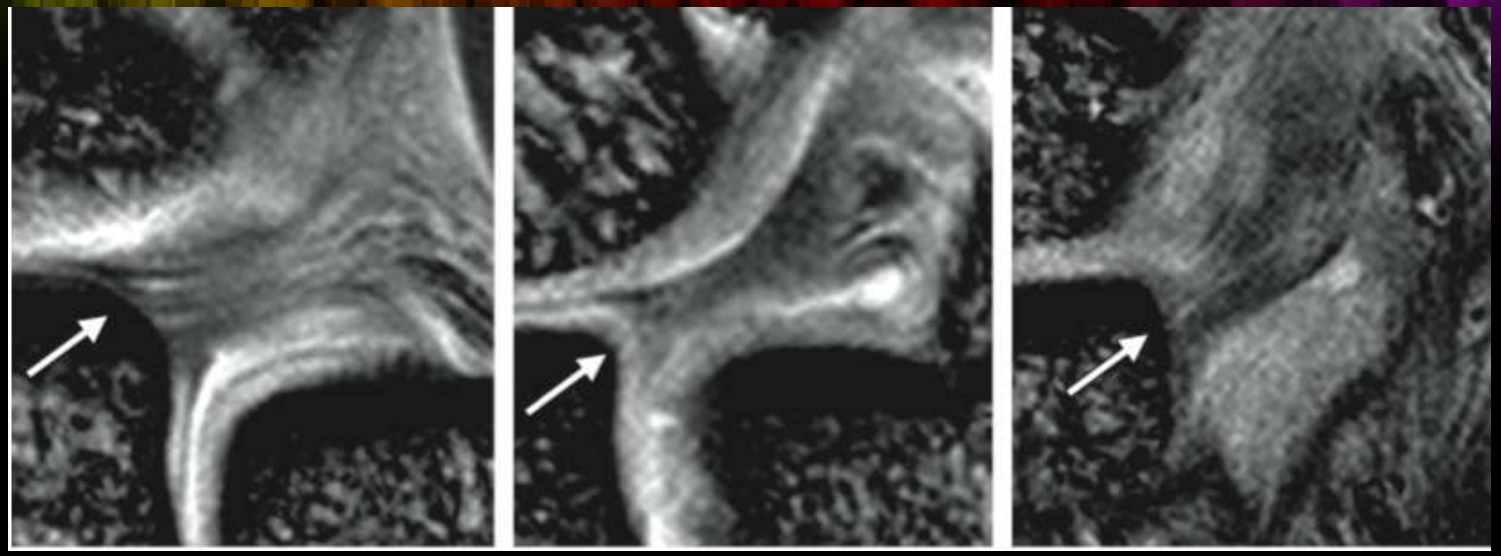


Dorsal Radioulnar Ligament

- Attachments: dorsal rim of sigmoid notch, fovea of ulna
- Dorsal periphery of the TFC
- Direct, focal osseous attachment to the sigmoid notch of the radius



Yoshioka et. al (2012)



Volar Radioulnar Ligament

Articular Disc

Dorsal Radioulnar Ligament

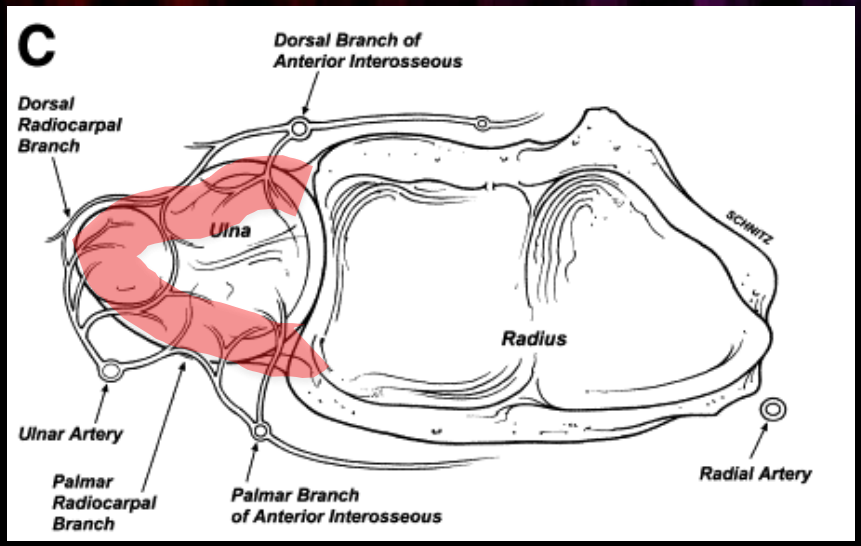
Burns, et al. "Pitfalls that may mimic injuries of the triangular fibrocartilage and proximal intrinsic wrist ligaments at MR imaging." Radiographics 31.1 (2011): 63-78.

Other Important Anatomy

- Blood Supply of TFCC
- Distal Radioulnar Joint
- Ulnar Variance

TFCC Blood Supply

- From ulnar artery
  1. Ulnar artery proper near ulnar styloid process
  2. Dorsal branches of anterior interosseous artery
  3. Palmar anterior interosseous artery
- Rich peripheral blood supply to the outer 10-40%
  - Can mount a reparative response
- Avascular central portion and radial attachment
  - Unable to heal



Distal Radioulnar Joint (DRUJ)

- TFCC
  - Volar and dorsal radioulnar ligaments are structures primarily responsible for stabilization of the DRUJ
- Important to assess alignment

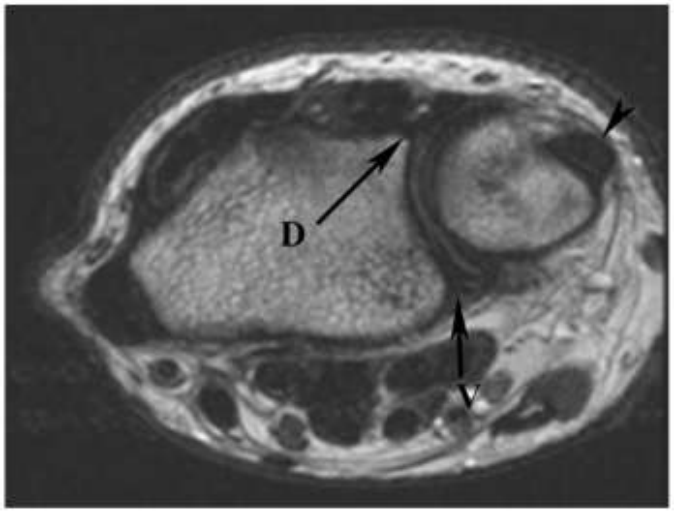
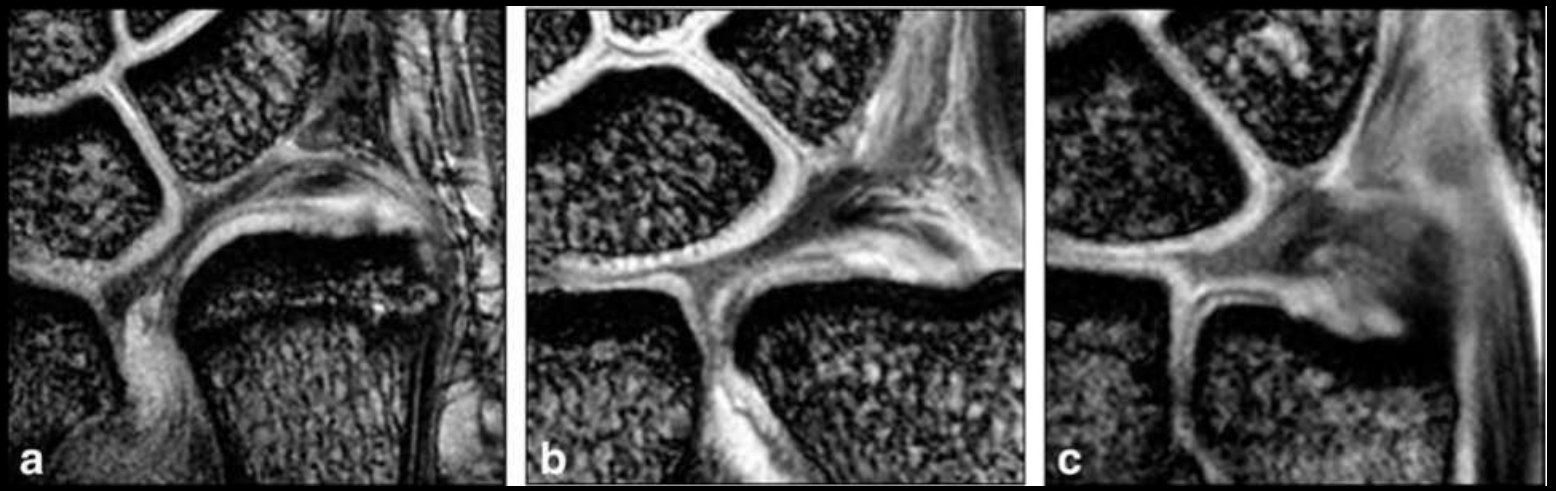


Fig. 8. Distal radioulnar joint (DRUJ). Axial FSE T2-weighted MR image. Note the distal ulna within the sigmoid notch of the radius. The volar (V) and dorsal (D) radioulnar ligaments are seen. Also note the ECU tendon within a notch in the distal ulna (*arrowhead*).

Zlatkin et al. (2006)

Ulnar Variance

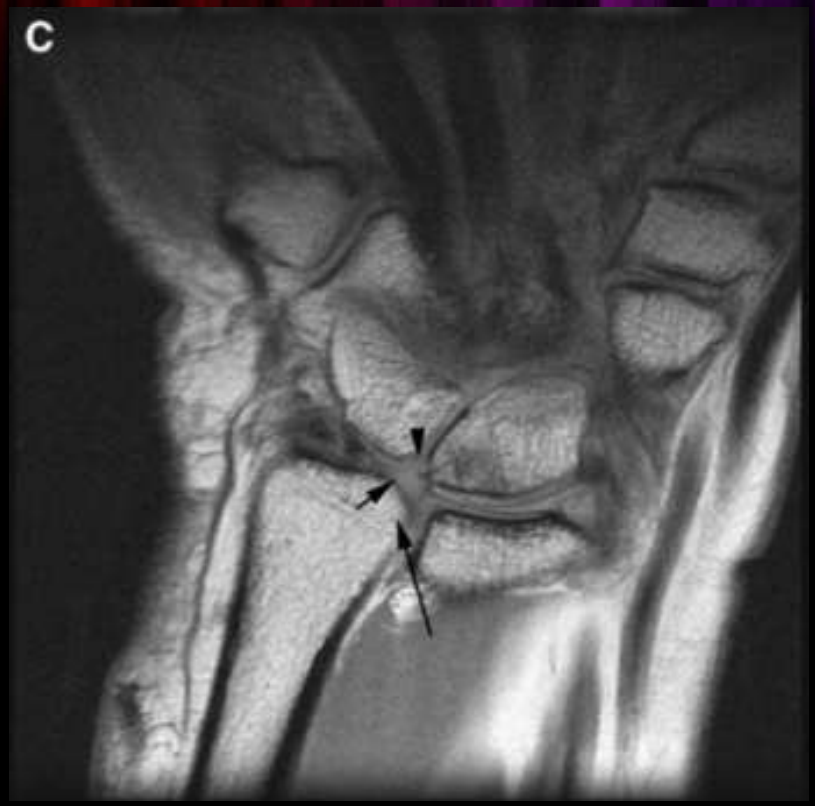
- Thickness of TFC inversely proportional to ulnar length
  - Thinner TFC with ulnar positive variance



Yoshioka et. al (2012)

Positive Ulnar Variance

- Associated with ulnocarpal abutment syndrome due to inc ulnar carpal loading
  - Occurs most commonly in ulnar + wrist
  - Can also occur in wrist with either ulnar - or neutral variance
  - Erosive changes in the cartilage of ulnar head and lunate, deg perforation of disc, tear of lunotriquetral lig
- These changes have been described in pts with degenerative perforation of TFCC
- More susceptible to tears of TFCC
- Studies found no sign correlation between (congenital) ulnar positive variance and TFC tears (Manaster et al., Iordache et al.)
  - But if acquired (eg. post traumatic shortening of radius) change of ulnar variance
  - 1mm change inc mechanical load across the ulnocarpal joint by more than 25%



Zlatkin et al. (2006)

Negative Ulnar Variance

- Ulnar minus leads to relative decrease load on the distal portion of the ulna
  - TFC is thicker and TFCC abN are less common
  - If torn, more likely to be traumatic and in younger pts
  - Associated with Kienbock's disease

Zlatkin et al. (2006)

TFCC Mechanism of Injury

- Traumatic Injuries
  - Fall on a pronated, ulnar deviated, outstretched extremity
  - Rotational injury to the forearm
    - Electric Drill (bit is stuck and torque is transmitted to wrist)
  - Axial load to wrist
  - Distraction injury to the ulnar side of the wrist

- Degenerative Injuries
  - Repetitive
    - loading of ulnar aspect of wrist
    - pronation and supination
    - Gripping
      - Can inc ulnar variance by 2mm
  - Tennis players
  - Gymnasts

on. (a) Radius is foreshortened in pronation. (b) Axial load
C central disc

History- Symptoms

- Ulnar sided wrist pain
- Pain
  - ulnar deviation activities
  - Activites with gripping and twisting- eg opening a jar
- Clicking & snapping

Physical Exam

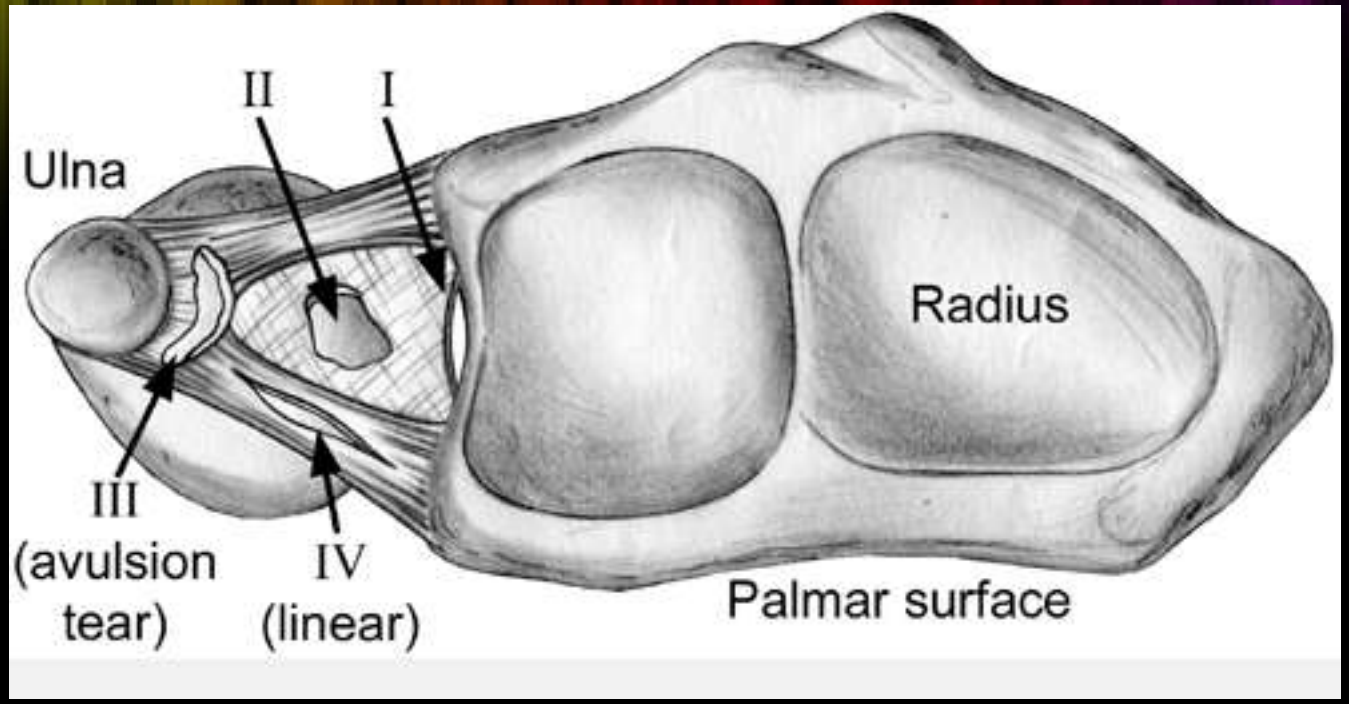
- Ulnar Snuff Box tenderness
- Ulnar Grind Test
- TFCC pathology can be difficult to diagnose with history and physical exam

Differential Diagnosis of TFCC Injury

Table 1
Differential Diagnosis of Triangular Fibrocartilage Injury

1. Bony injury
   a. Ulnar styloid fracture
   b. Hamate fracture
   c. 5th metacarpal base fracture
   d. Pisiform fracture
   e. Kienbock's disease
2. Ligamentous and tendinous disorders
   a. TFCC injury
   b. Extensor carpi ulnaris (ECU) disorders
      1. subluxation, dislocation
      2. tendinopathy, tenosynovitis
      3. rupture
   c. Flexor carpi ulnaris tendinitis
3. Neurological pain - Guyon's canal syndrome
4. Carpal instability
   a. Lunotriquetral dissociation
   b. Midcarpal instability
5. Radioulnar joint disorder
   a. Distal radioulnar joint instability
   b. Madelung's deformity
6. Impaction syndromes
   a. Ulnar impingement syndrome
   b. Ulnar impaction syndrome
   c. Hamatolunate impaction syndrome
   d. Ulnar styloid impaction syndrome

Mayo Clinic Classification of TFC Tears



Palmer Classification

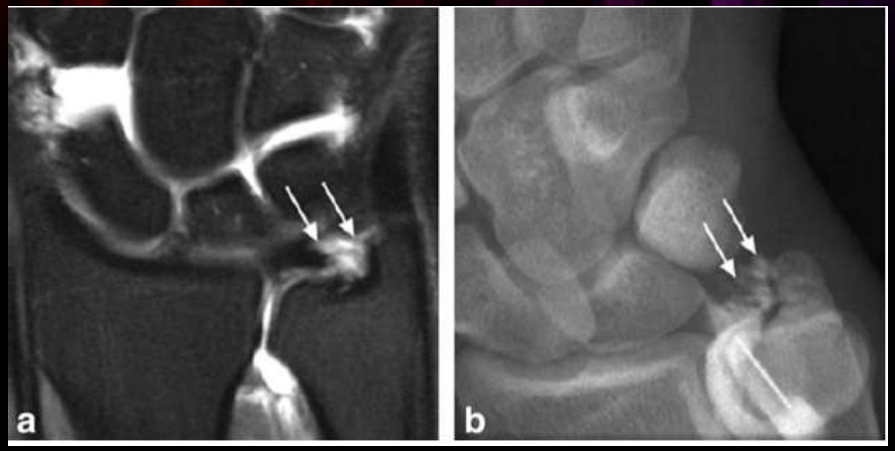
- Cause, Location & Extent
- Type 1
  - Cause: Traumatic Injury
- Type 2
  - Cause: Degenerative Injury
  - Can be thought of progressive stages of ulnocarpal abutment syndrome

Palmer Classification

- Type 1
  - A: Central Perforation
    - Avascular articular disc
  - B: Ulnar avulsion +/- without distal ulnar fracture
    - Base of the ulnar styloid
  - C: Distal Avulsion
    - Carpal detachment
  - D: RaDius Avulsion
- Type 2
  - A: Wear of the articular disc (without perforation)
  - B: Wear + chondromalacia of lunate or ulna
  - C: Central perforation + Chondromalacia
  - D: Perforation + chondromalacia + LT lig disruption
  - E: Perforation + chondromalacia + LT lig disruption + ulnocarpal arthritis (End Stage)

Palmer Classification

- Communicating tear in TFCC
  - full-thickness
- Non-communicating tear
  - partial thickness
- Must describe each lesion
  - Eg. Dorsal and volar radioulnar ligaments injuries not described under the Palmer Classification

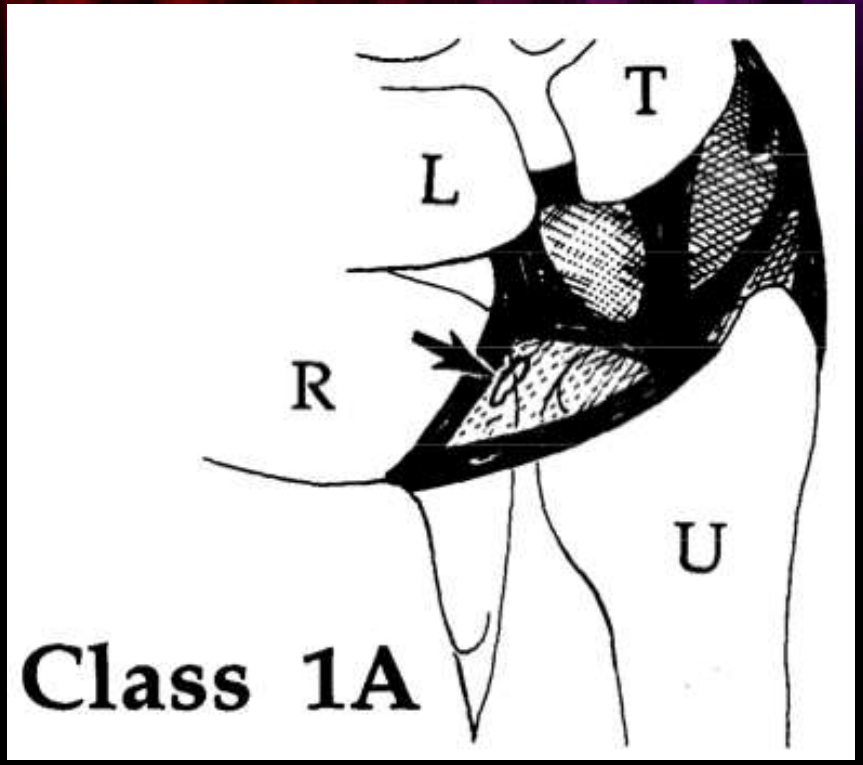


Yoshioka, Hiroshi, and Joseph E. Burns. "Magnetic resonance imaging of triangular fibrocartilage." *Journal of Magnetic Resonance Imaging 35.4 (2012): 764-778.*

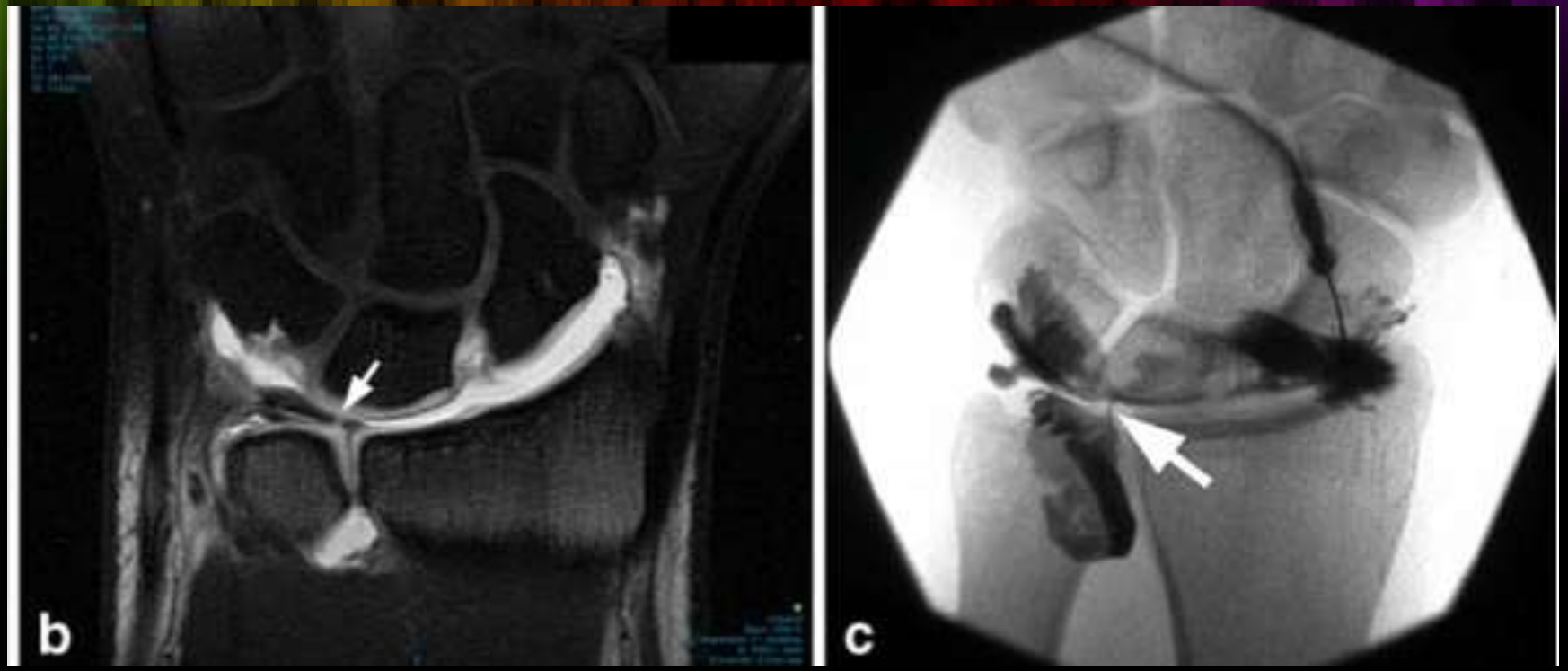
Traumatic TFCC Injury Type 1

Type 1A
Central Perforation

- Central tear or perforation of the articular disc of TFCC
- Avascular articular disc
- Slit like, sagittally oriented
- 2-3mm medial to radial attachement of TFCC
- 10% of type 1 tears



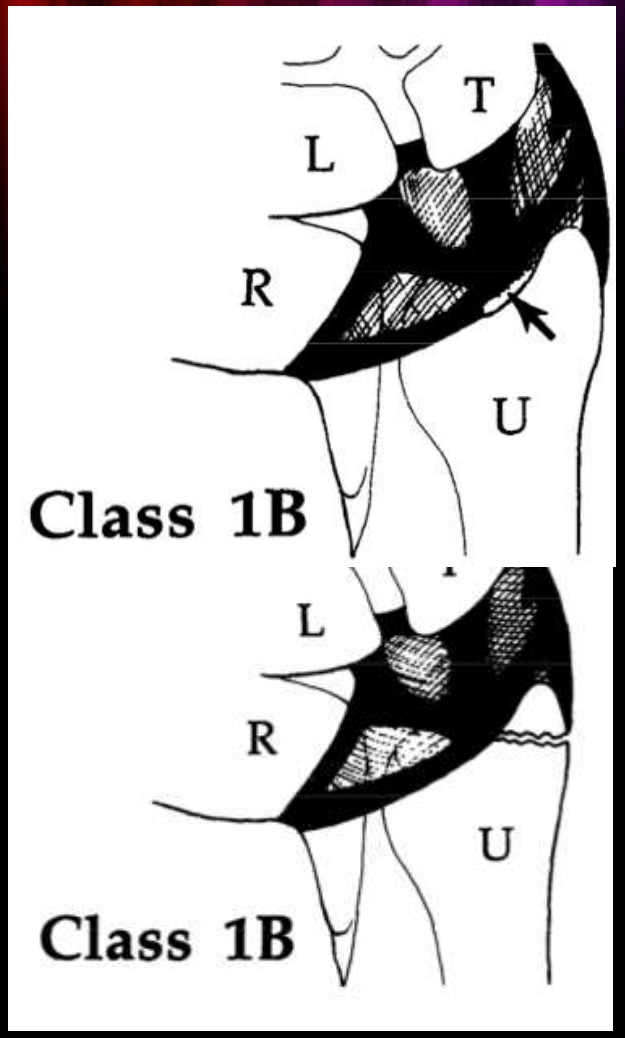
Type 1A
Central Perforation



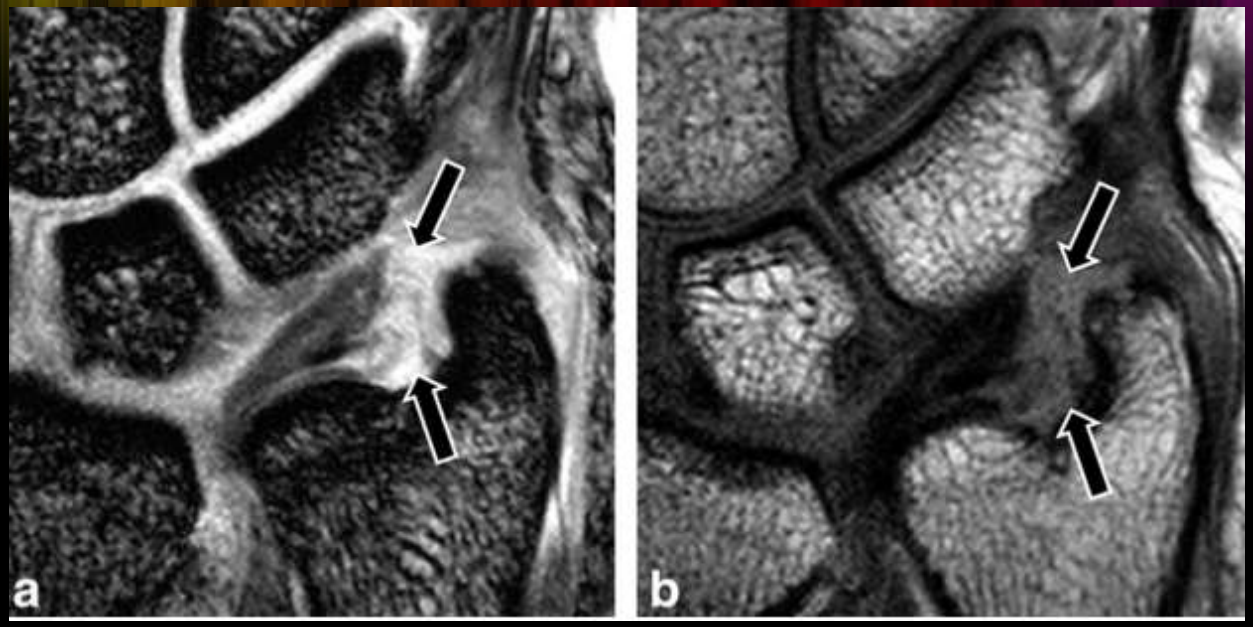
Maizlin et al. (2009)

Type 1B
Ulnar avulsion +/- without distal ulnar fracture

- Avulsion from its attachment at the distal ulna
- +/- # at Base of the ulnar styloid
- 1/3 have associated with DRUJ instability
  - Injury to ulnar attachment of dorsal and palmar radioulnar ligaments
- 15% of type 1 tears

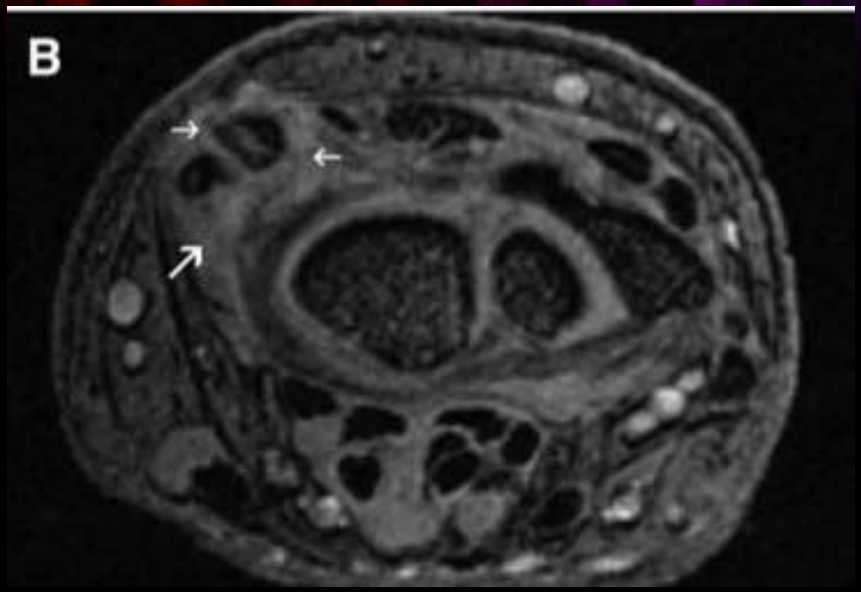


Type 1B
Ulnar avulsion +/- without distal ulnar fracture



Yoshioka et. al (2012)

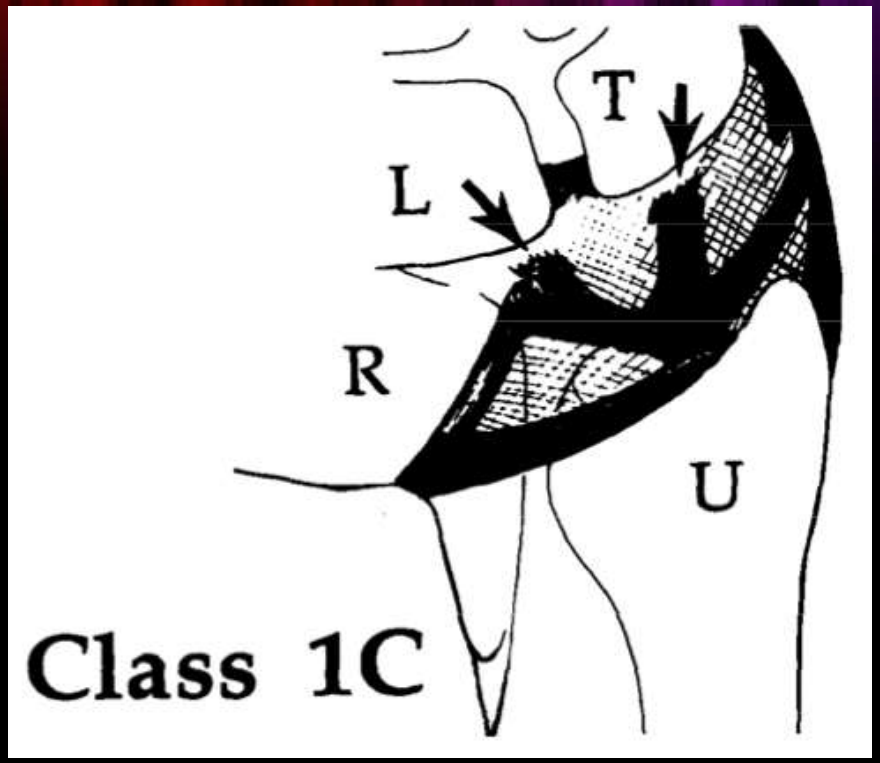
Type 1B
Ulnar avulsion +/- without distal ulnar fracture



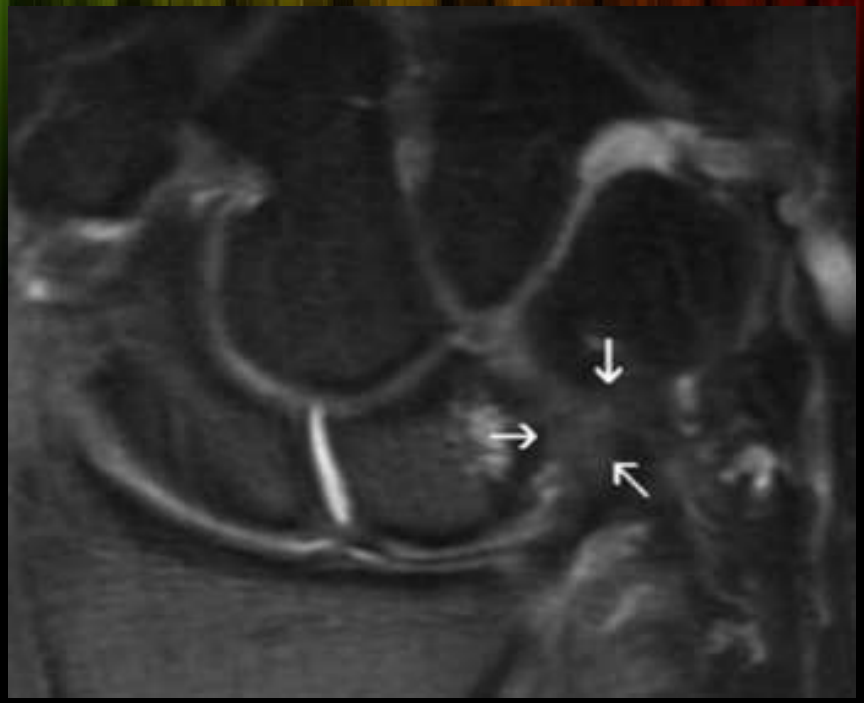
Daunt (2002)

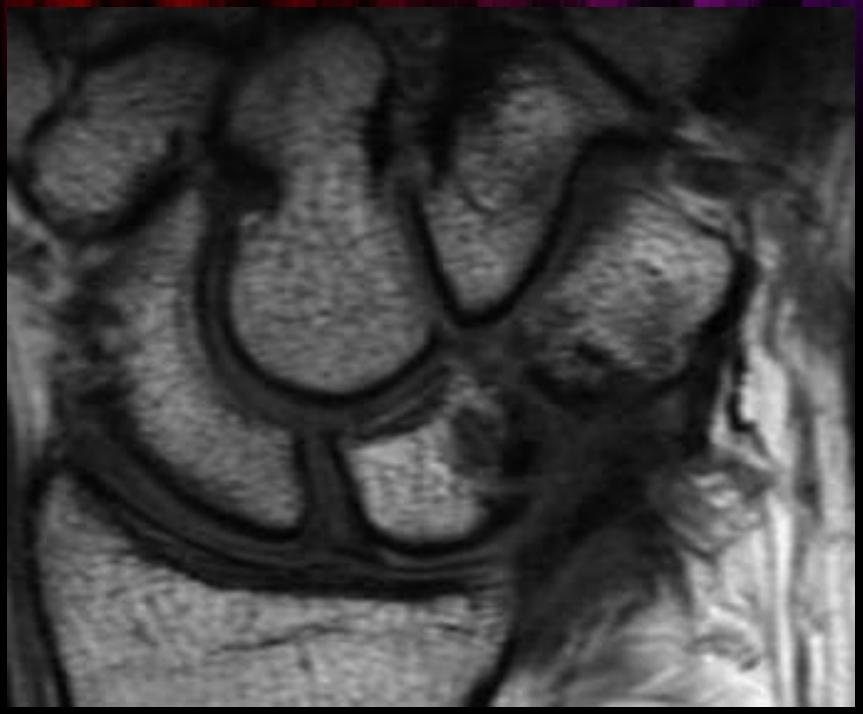
Type 1C
Distal Avulsion

- Distal avulsion of TFCC at site of attachment to lunate or triquetrum
- Reflects tear of ulnolunate and ulnotriquetral ligaments the volar attachment of the TFCC to the carpus
  - Volar translation of carpus on ulna
- Carpal detachment
- 13% of type 1 tears



Type 1C
Distal Avulsion

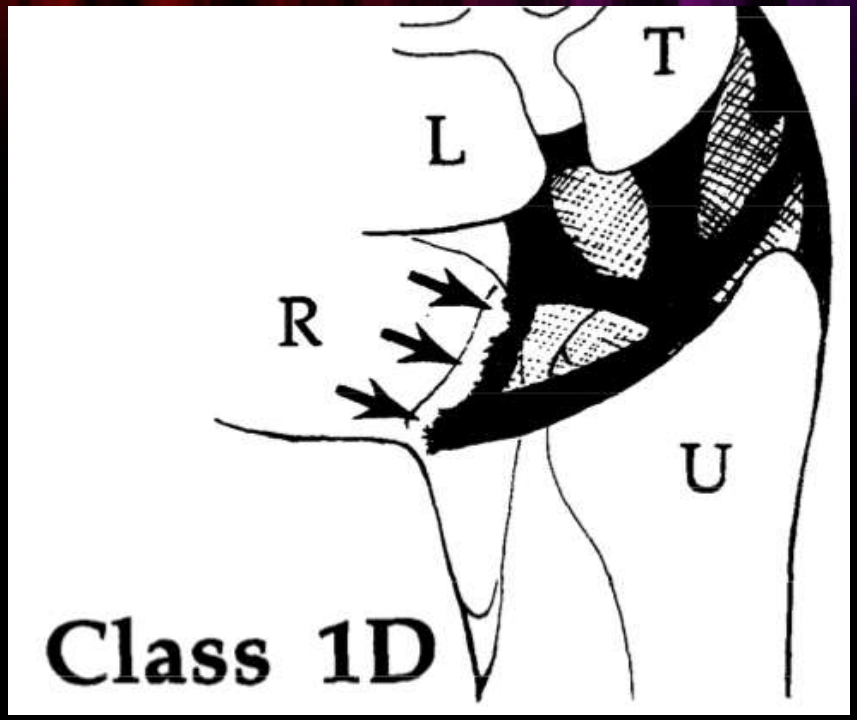




Daunt (2002)

Type 1D
Radius Avulsion

- Avulsion of TFCC form attachment to radius at distal aspect of sigmoid notch
- may be associated with avulsion # or distal radial #
- RaDius Avulsion
- May lead to instability of the DRUJ
  - Involves attachment of radioulnar ligaments
- 50% of type 1 tears



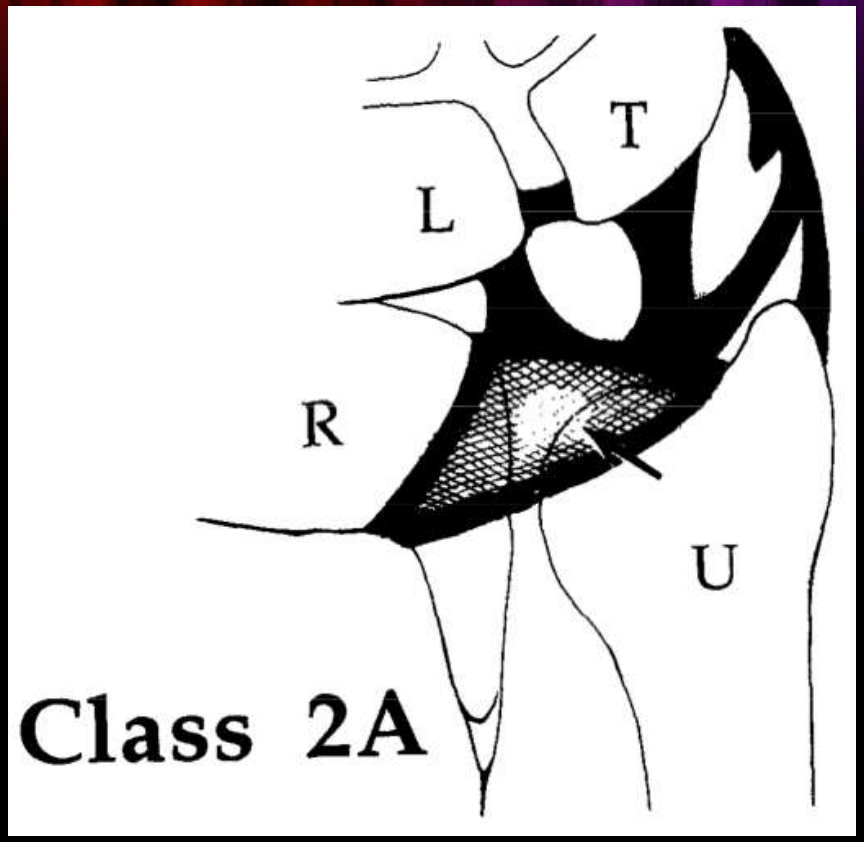
Type 1D
Radius Avulsion

Zanetti et al. (2007)

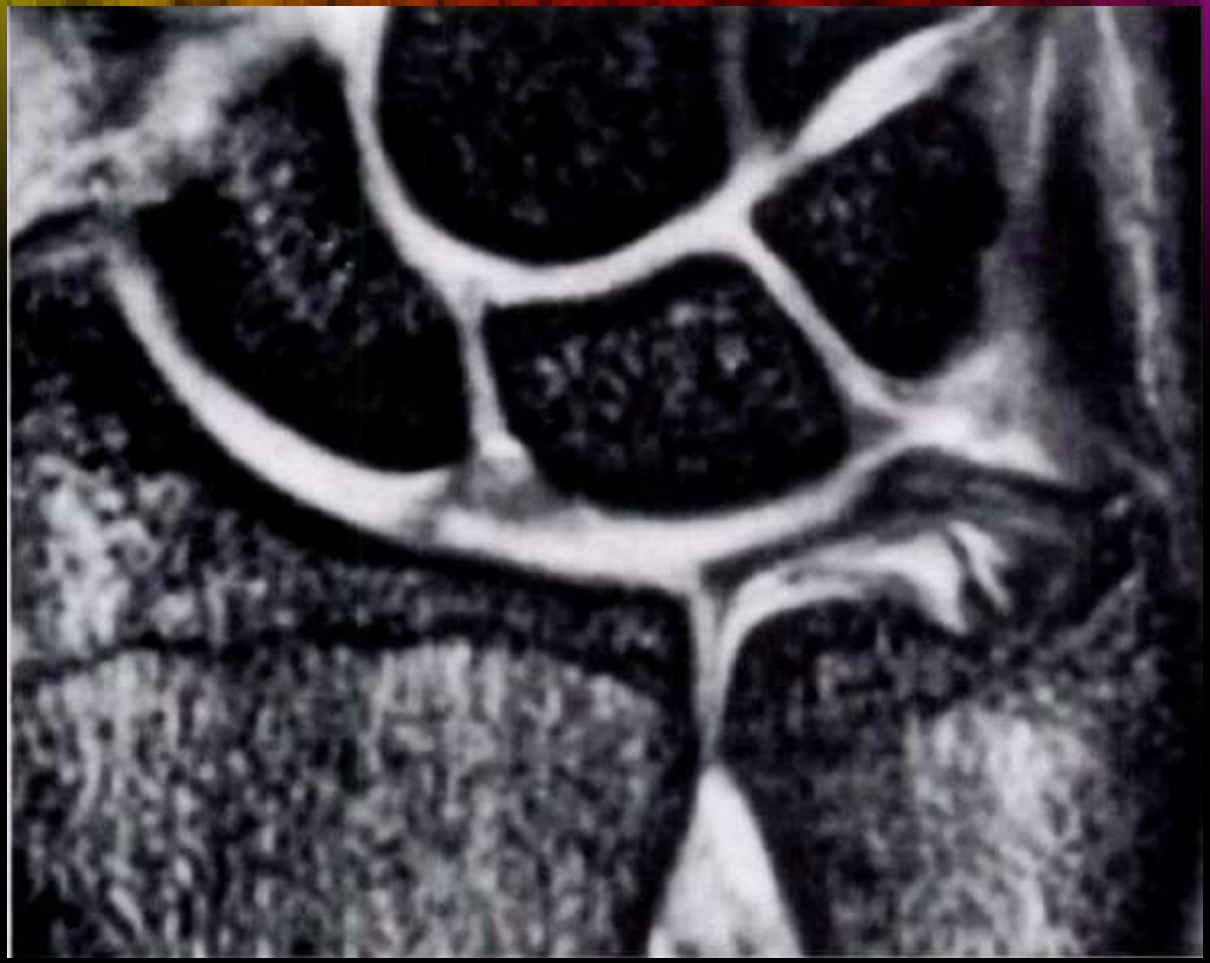
Degenerative TFCC Injury Type 2

Type 2A
Wear of the articular disc

- Wear or thinning of the distal and proximal surfaces or Articular disc
- Fraying without perforation



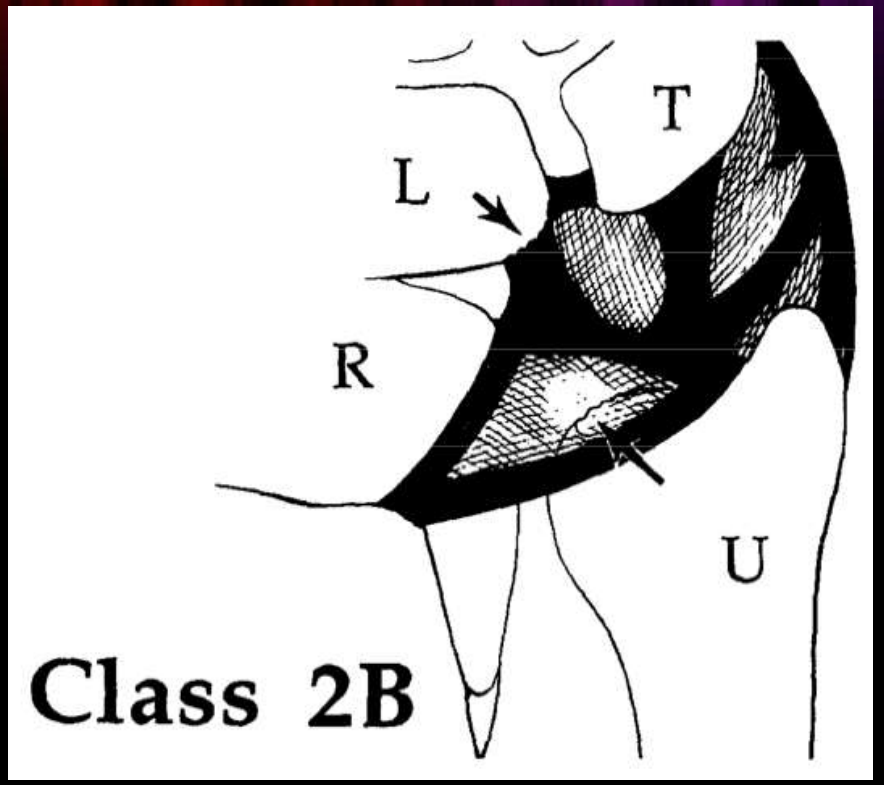
Type 2A
Wear of the articular disc



Oneson et al. (1996)

Type 2B
Wear of TFCC + chondromalacia of lunate or ulna

- Cartilage changes on the inferomedial aspect of lunate or radial portion ulna
- Abnormal signal intensity, irregularity, thinning of cartilage



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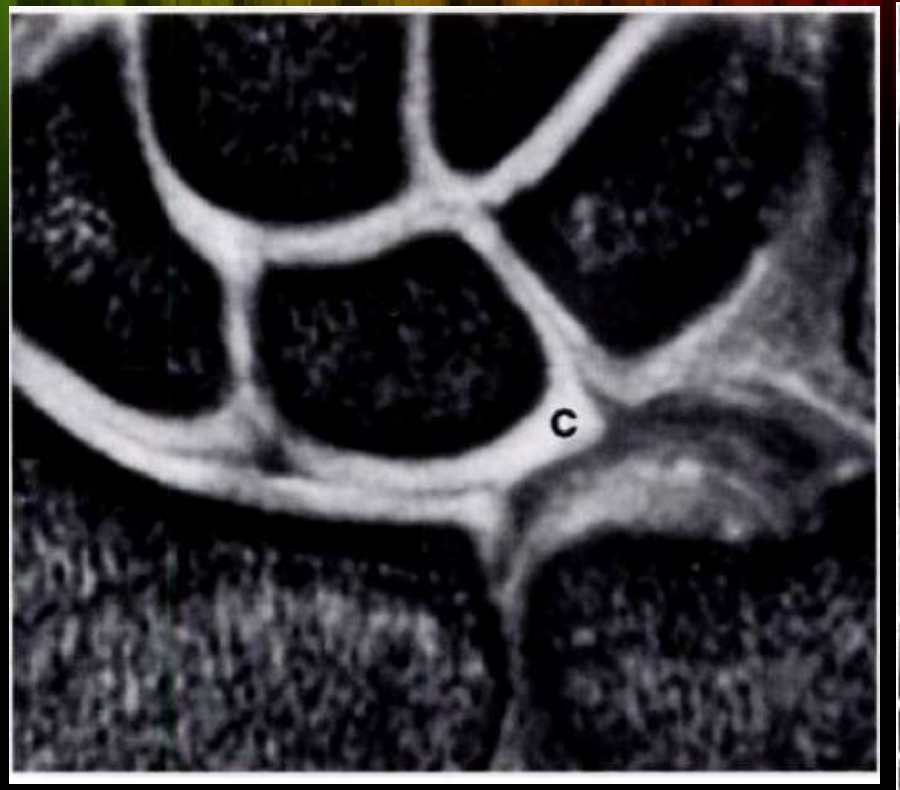
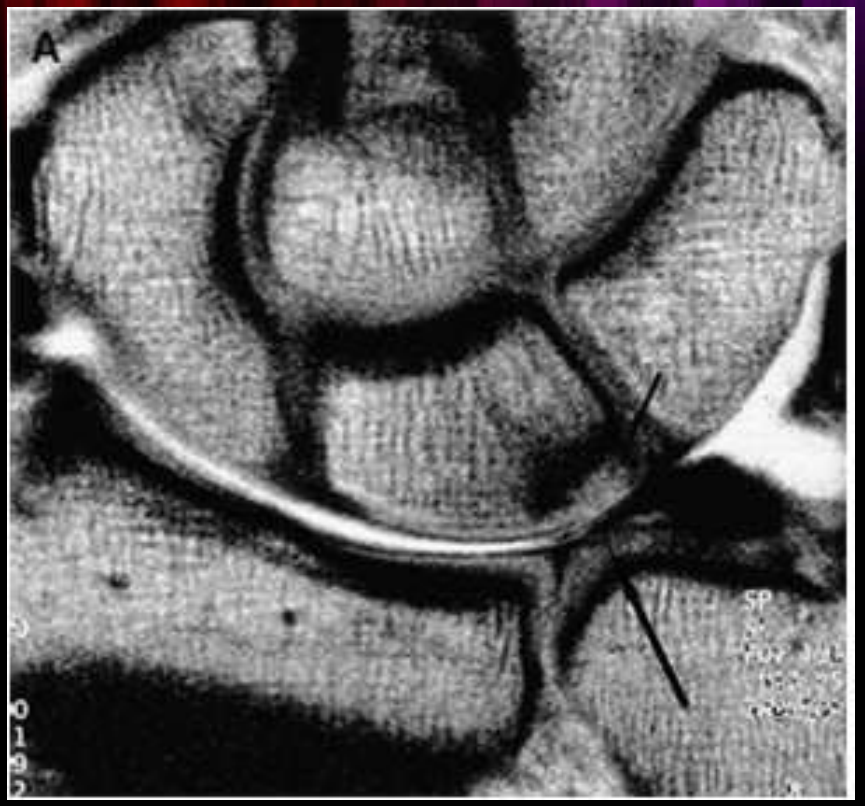
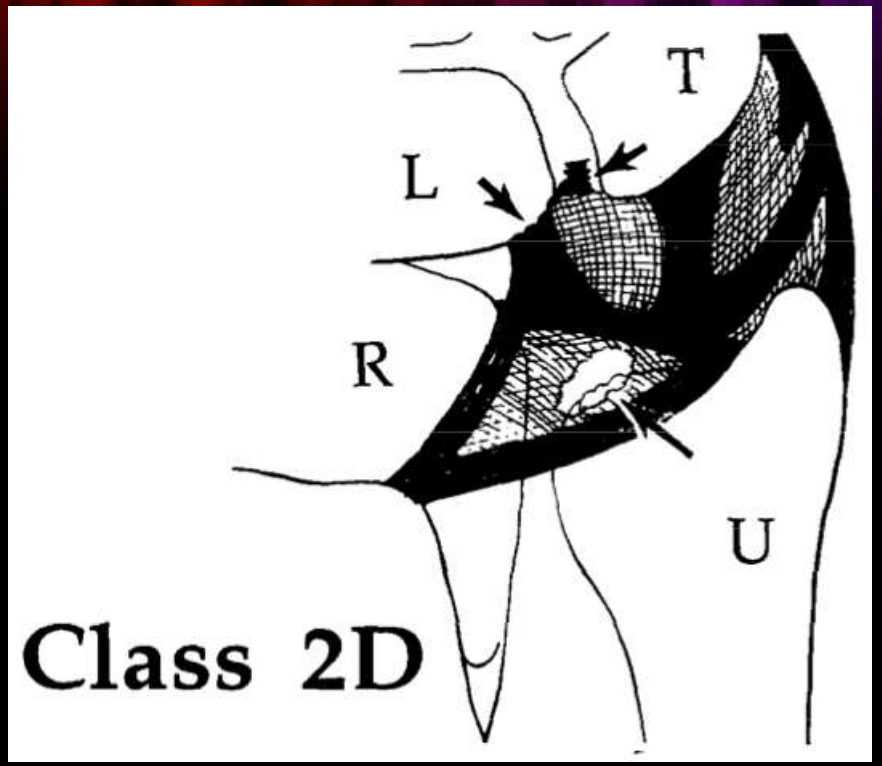


Oneson et al. (1996)

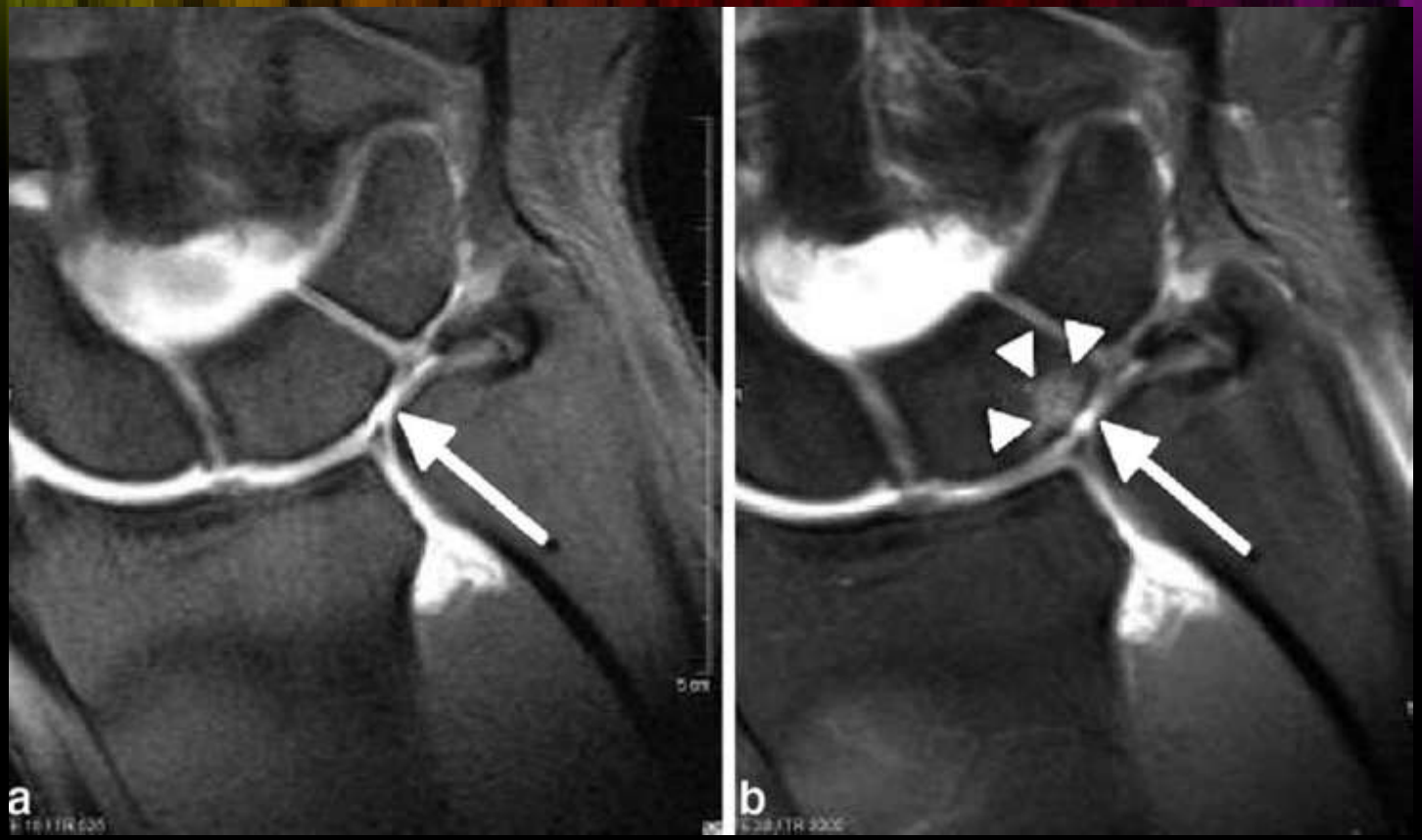


Zlatkin et al. (2006)

- Central perforation with ulnolunate chondromalacia
- More ulnar location than that seen in traumatic injury (1A)
- Ovoid perforation with tapered appearance of TFC at margins of perforation (vs. straight, margins of traumatic slitlike tear)



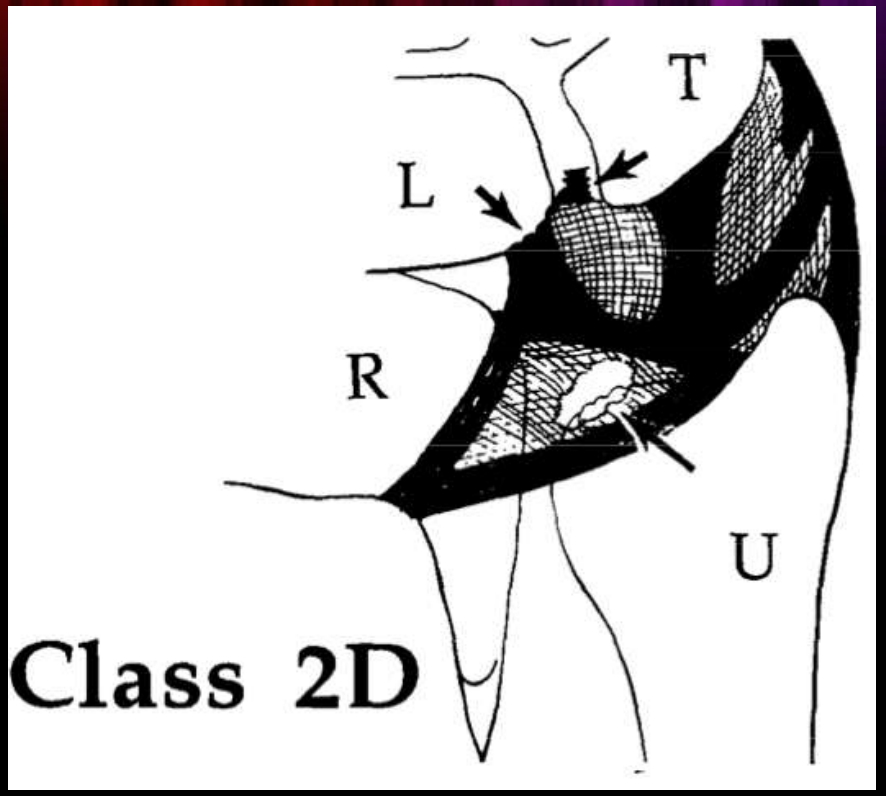
Type 2C
Central perforation + chondromalacia



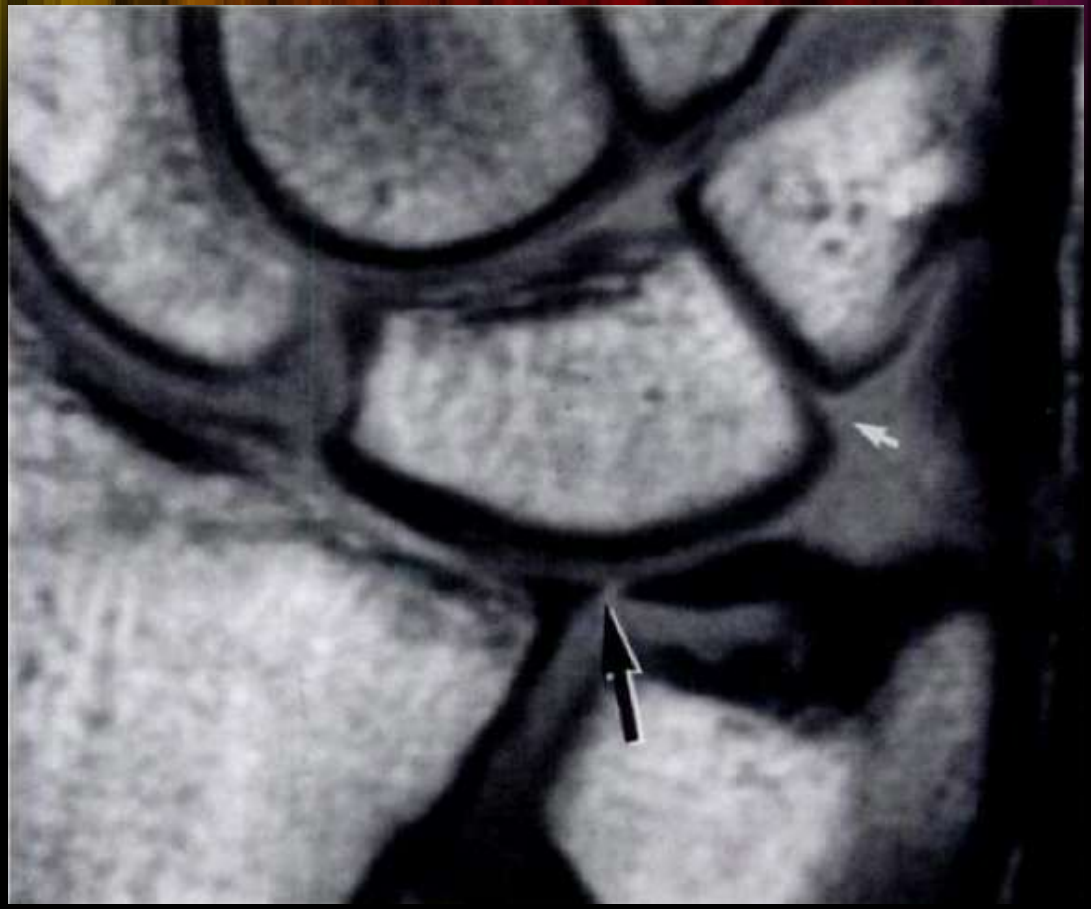
Zanetti et al. (2007)

Type 2D
Perforation + chondromalacia + LT lig disruption

- TFC perforation with ulnolunate chondromalacia
- Lunotriquetral ligament disruption
- Lunotriquetral instability



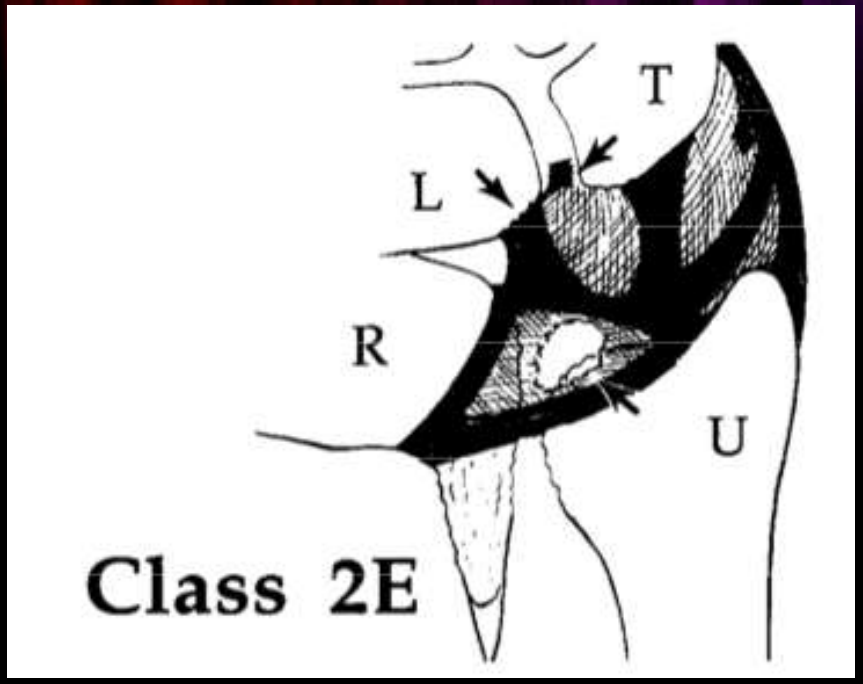
Type 2D
Perforation + chondromalacia + LT lig disruption



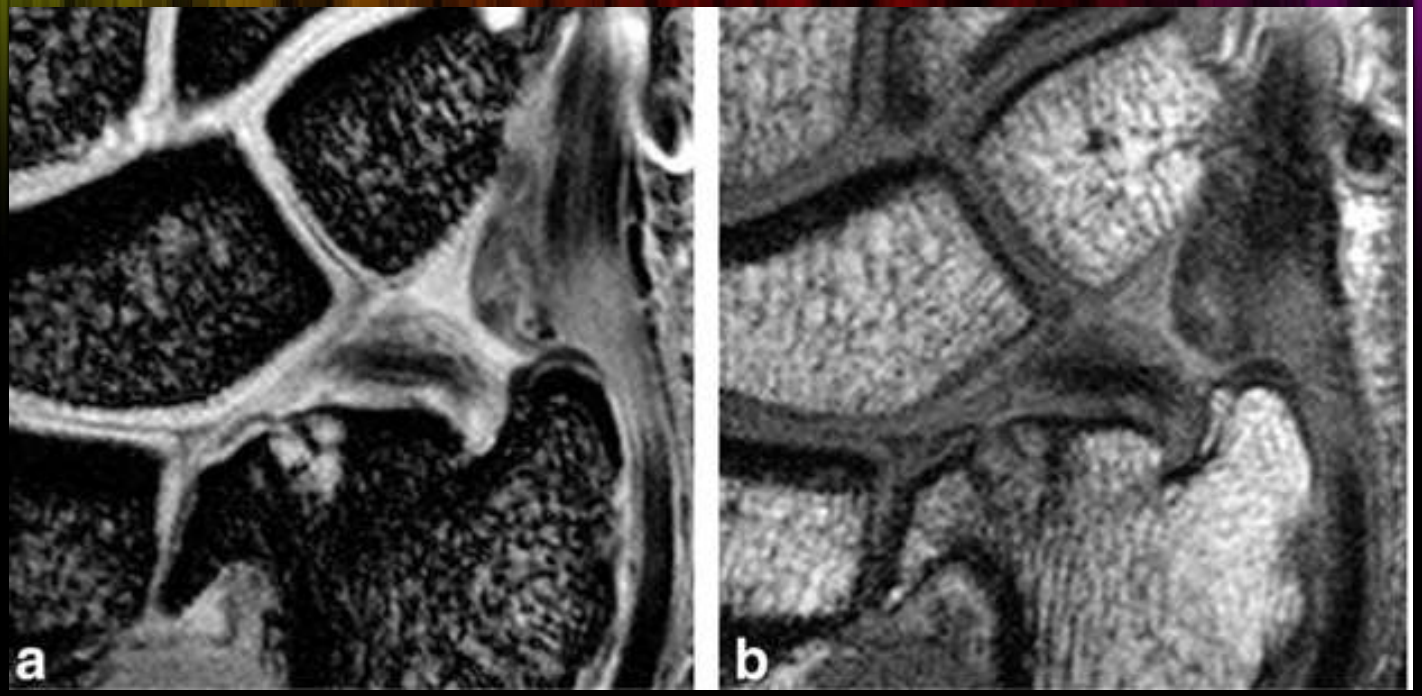
Oneson et al. (1996)

Type 2E
Perforation + chondromalacia + LT lig disruption + ulnocarpal arthritis

- All of above with ulnocarpal arthritis
- End Stage
- May also be degenerative arthritis of DRUJ
  - The TFC is usually completely absent



Type 2E
Perforation + chondromalacia + LT lig disruption + ulnocarpal arthritis



Yoshioka et. Al (2012)

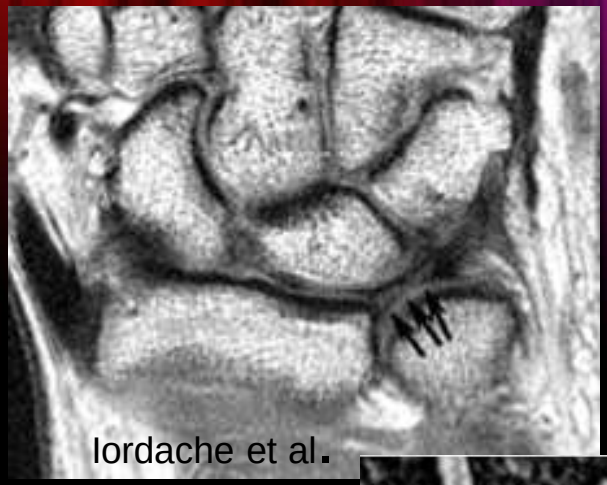
TFCC Degeneration

- Older pts may show abnormal inc
- Without thinning or extension of high signal to the articular surfaces (tearing)
- Globular or curvilinear pattern
- Thought to be due to mucoid degenerative changes

Burns, et al. (2011)

Asymptomatic Abnormalites of the TFCC

- Several studies demonstrating not all signal abnormalities or defects of the TFC are symptomatic [3,14, 38-41]
  - 12%-73% of asymptomatic subjects
- In 180 cadaveric wrist (Mikic et al.)
  - Fetuses, 1st & 2nd decade= no deg changes
  - 3rd decade =7.6% had perforation
  - all > 50yo showed deg changes
- In 103 Axsymptomatic volunteers (Iordache et al. 2012)
  - > 60% abN findings in > 50yo
- An associated pattern of deg changes in the wrist as a whole
- Important to know location, age and clinical history

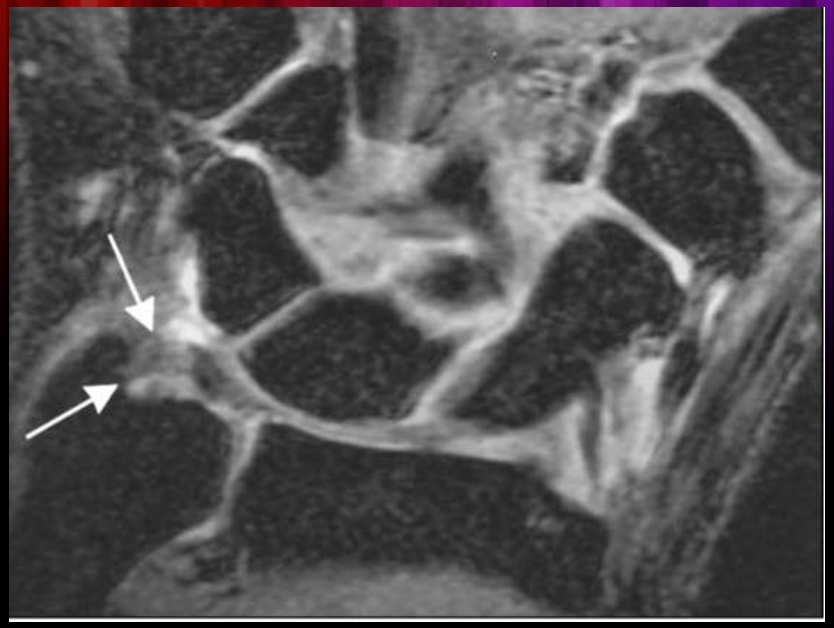


Iordache et al.

Yoshioka et. al (2012)

Tears of Ulnar Attachment of TFCC

- Peripheral tears:
  - SN 17%, Sp 79%, accuracy 64% when disruption was used as a marker of tearing at ulnar attachment was used
  - SN 42%, SP 63%, accuracy 55% when high signal (Haims et al.)
  - Accuracy 25% (Onesone et al.)
- Central & Radial tears: 97% accuracy
- Attention to focal synovitis may improve SN
- Tears to the UCL and ECU are sparsely described in literature
- Lesions located close to ulnar insertion are more likely to be symptomatic & perforation requiring surgical treatment



Periperal Tear found at surgery

Haims et al. (2002)

Treatment

- Conservative treatment with immobilization
  - No instability
  - for most acute TFCC injuries
- Surgical management
  - Failed conservative management
  - Acute instability

Treatment

Palmer Class	Treatment
1A- Avascular Articular disc perforation or tear	Little chance for healing with repair. But many become axsymptomatic- conservative Rx. Arthroscopic debridement. No inv instab of DRUJ. Central disc can be removed without loss of function or instability.
1B- Avulsion from Base of ulnar styloid +/- ulnar styloid fracture	Reduction of ulnar styloid #. Rich vascularity of TFCC is favorable environment for operative or arthroscopic repair. Instability- reattachment of TFCC to capsule. Thick peripheral rim helps share axial load and shear forces.
1C- Carpal detachment.	Open or arthroscopic repair of ulnotriquetral or ulnolunate ligaments. Repair complicated by proximity of tear to ulnar artery and nerve.
1D -Detachment from the raDius	Radial attachment is an avascular area of TFCC. Debridement, but favorable results with repair. Correct treatment is being debated.
2A- Wear of the disc	Usually no mechanical symptoms (no perforation or flap to cause clicking) Conservative Management. Arthroscopy is not indicated.
2B- Thinning + chondromalacia of lunate or ulna	Conservative management. May treat as ulnar impaction. Ulnar shortening. Wafer procedure: Open procedure or arthroscopic. Resect 2 mm of distal ulnar head down to subchondral bone, leaving TFCC attachments and DRUJ. Unloads the TFCC while maintaining DRUJ stability.
2C- Perforation with chondromalacia	Ulnar shortening osteotomy. Wafer procedure
2D-Perforation, chondromalacia, LT lig disruption	
2D- Stable LT joint.	Arthroscopic wafer procedure
2D -Unstable LT joint	Ulnar shortening to help tighten the ulnocarpal ligaments, stabilize the ulnar carpus. Limited intercarpal fusion.
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1C- Carpal detachment.	Open or arthroscopic repair of ulnotriquetral or ulnolunate ligaments. Repair complicated by proximity of tear to ulnar artery and nerve.
1D -Detachment from the raDius	Radial attachment is an avascular area of TFCC. Debridement, but favorable results with repair. Correct treatment is being debated.
2A- Wear of the disc	Usually no mechanical symptoms (no perforation or flap to cause clicking) Conservative Management. Arthroscopy is not indicated.
2B- Thinning + chondromalacia of lunate or ulna	Conservative management. May treat as ulnar impaction. Ulnar shortening. Wafer procedure: Open procedure or arthroscopic. Resect 2 mm of distal ulnar head down to subchondral bone, leaving TFCC attachments and DRUJ. Unloads the TFCC while maintaining DRUJ stability.
2C- Perforation with chondromalacia	Ulnar shortening osteotomy. Wafer procedure
2D-Perforation, chondromalacia, LT lig disruption	
2D- Stable LT joint.	Arthroscopic wafer procedure
2D -Unstable LT joint	Ulnar shortening to help tighten the ulnocarpal ligaments, stabilize the ulnar carpus. Limited intercarpal fusion
2E- Perforation of disc, chondromalacia, lunotriquetral lig disruption, ulnocarpal arthritis	Ulnar head resection. End stage. Requires salvage procedures, full recovery cannot be expected.

Imaging

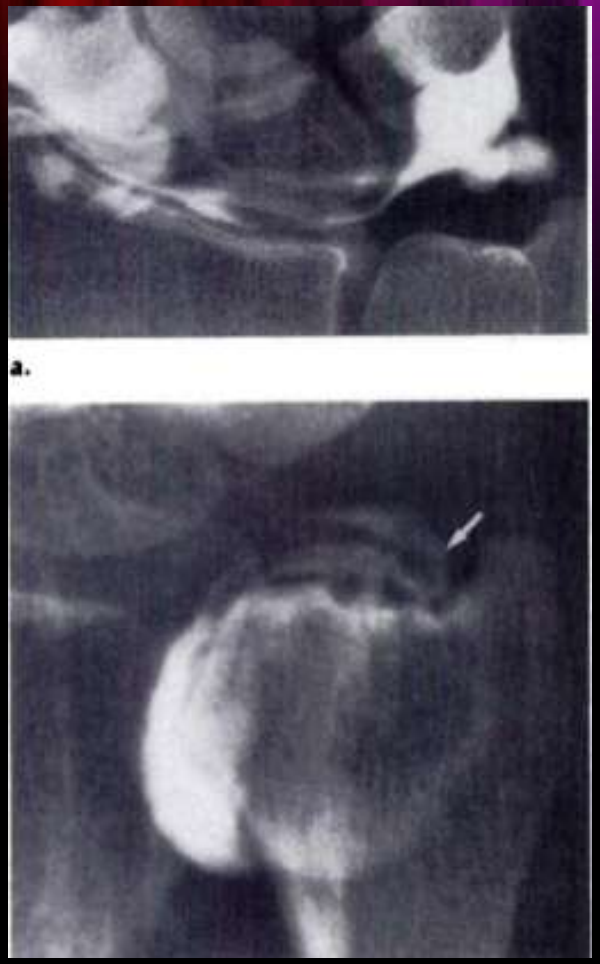
- Radiographs
- Conventional Arthrography
  - Single compartment
  - Multicompartment
- CT Arthrography
- MRI
- MR Arthrography
- US

Imaging- Radiographs

- Look for osseous cause of pain
- Alignment
- Neutral PA forearm films to evaluate for ulnar variance

Imaging- Single & Double Injection Conventional Arthrography

- Radiocarpal
- Distal radioulnar
- Multicompartment
  - To minimize false negative results in cases with flap tears or one way valves
  - Minimal additional defects are ID
  - In 75 cases of complete defects, only 2 additional defects were found with DRUJ inj (Levinsohn et al.)
  - None were missed with RCJ injection alone (Manaster et al.)



Levinsohn et al.

Imaging- Conventional Arthrography

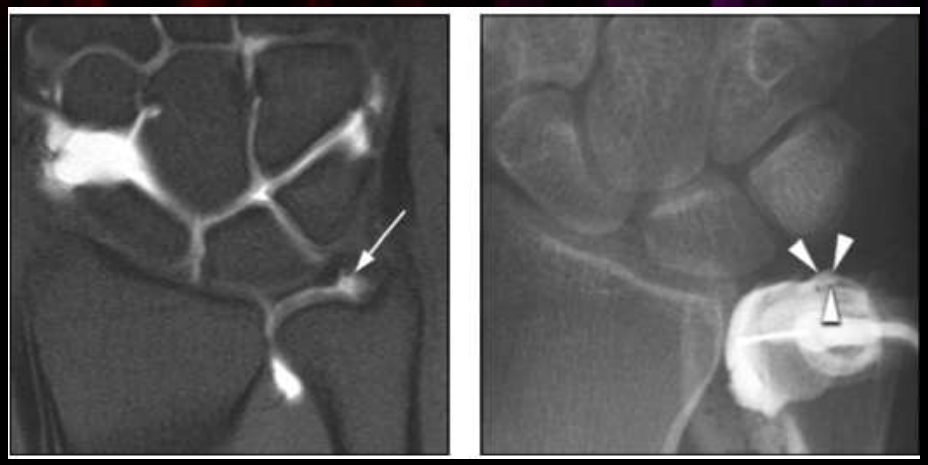
- Arthrography vs arthroscopy
  - 42%-70% agreement with arthroscopy (Chung et al., Schers et al., Levinsohn et al., Roth et al.)
  - SN 52 %, SP 50% (Vanden Eyde et al.)
- Partial ulnar sided tears most difficult to detect

Imaging- MRI

- Better at localizing site of injury and type of tear than arthrography
- Demonstrates surrounding soft tissues
- Allows assessment of other potential ST & osseous abnormalities which may be causing pt's symptoms
- Complete tears are better visualized than partial tears[27]

MR Arthrography

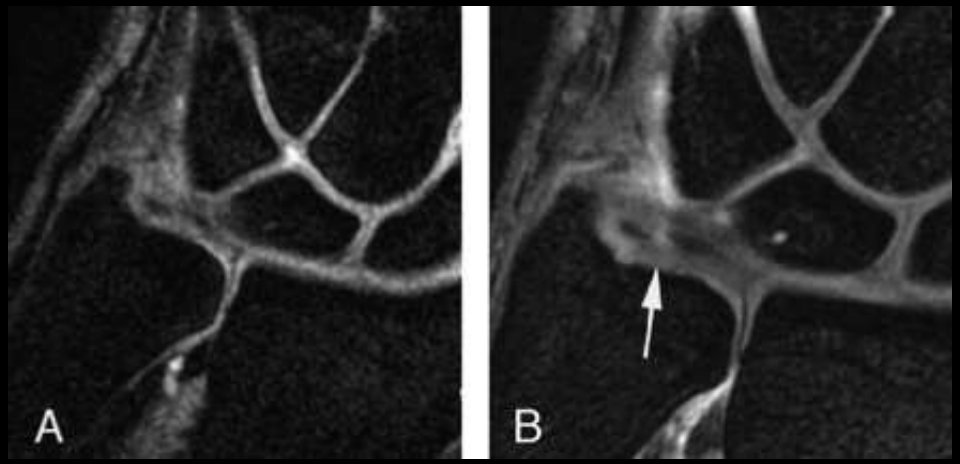
- Some suggest injecting the most clinically relevant compartment
  - adding additional injections if a tear is not seen on conventional arthrogram preceding MRAr[28]
- Some recommend injecting DRUJ[27, 29] first as non communicating defects of the ulnar attachments of TFC are more frequently symptomatic



Rüegger, Christoph, et al. "Peripheral tear of the triangular fibrocartilage: depiction with MR arthrography of the distal radioulnar joint." American Journal of Roentgenology 188.1 (2007): 187-192.

MRI vs. MR Arthrography (MRAr)

- Meta-analysis
- 21 studies
- Full thickness tears, insufficient data to compare partial thickness tears
- Insufficient data to compare single, double and triple compartment MRAr



- Diagnostic accuracy of MRAr superior to MRI
  - MRI: SN 75%, SP 81%
  - MRAr: SN 84%, SP 95%
- 3T MRI greater diagnostic test accuracy than 1.5T MRI
  - 1.5T: SN 70%, SP 79%
  - 3T: SN 86%, SP 100%
- 3T MRA greater diagnostic test accuracy than 1.5T MRA
  - 1.5T: SN 83%, SP 95%
  - 3T: SN 100%, SP 100%

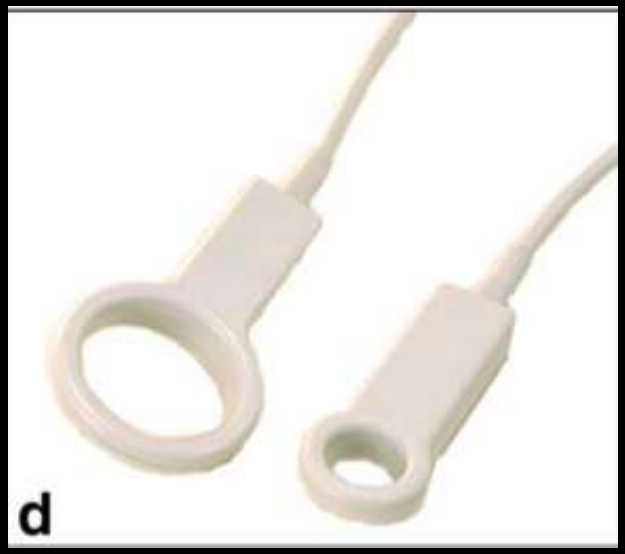
Stehling et al.

Indirect MR Arthography

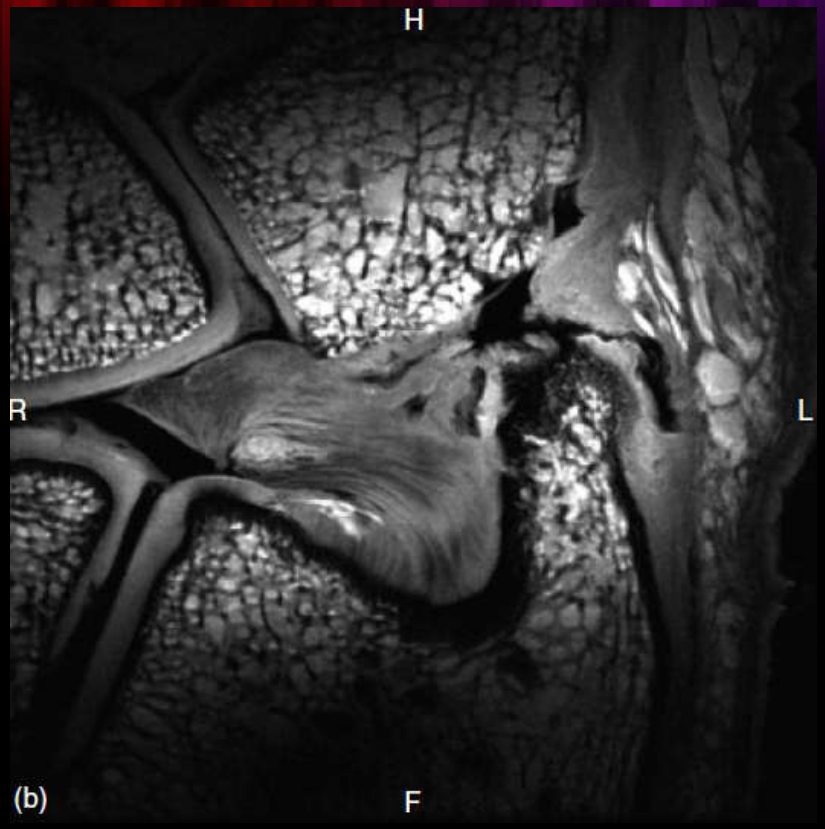
- Does not require radiation from fluroscopy or joint injection
- Hyperemic or inflamed tissue will enhance
- Well- vascularized regions (periphery) of TFCC will also enhance
  - Difficult to ID tear from normal findings
- Does not significantly improve ability to evaluate TFCC or lunotriquetral ligament

MR Technological Advances

- Higher Field Strengths
- Ultrafast 3D imaging sequences
- 3D High-resolution isotropic sequence
- High Resolution wrist microscopy coils



MR Technological Advances- Short TE



Yoshioka et. al (2012)

Bae, Chang, Chung. EMR 2012

Arthroscopy

- Gold standard for diagnosis of internal derangement of wrist
- SN and SP in ID tears of TFCC and coexisting lesions
- More expensive than MRI
- Risks of surgery
- Peripheral tears involving the fovea more difficult to detect

Cases

Case 1

33 yo. F

Ehlers-Danlos.

Rt wrist pain

Courtesy of Dr. Michael Thompson

Arthroscopy & MRI Cor PD FS

Central TFCC
Perforating tear
(1A)

Arthroscopy & MRI Cor PD FS

Peripheral Tear of TFCC (Palmer 1B)

Synovitis and peripheral TFCC tear

Arthroscopic Treatment

Peripheral TFCC tear

Debridement and repair

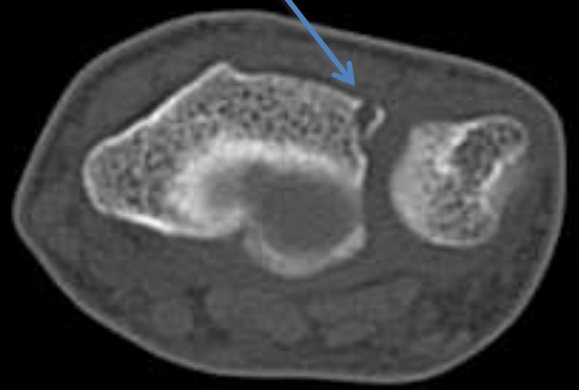
Case 2

15 yo M.
Fell skateboarding

Courtesy of Dr. Brady Huang

- Radiographs
  - Scaphoid waist fracture
  - Avulsed fragment along the distal to the DRUJ

Avulsion of the radial attachment of the dorsal radioulnar ligament



-AbN communication of contrast between the radiocarpal joint and the distal radioulnar joint. Site of communication at the radius
-Avulsion of the radial attachment of the dorsal radial ulnar ligament and tearing of the radial aspect of the central TFC.

(Palmer 1D)

Case 3

41 yo. F.

Rt wrist pain

Fall 2 yrs ago

Courtesy of Dr. Michael Thompson

Arthroscopy & MRAr Cor T1FS

-Central Unstable tear with flap.

-Chondromalacia along the lunate

-Communication of contrast between the RC and DRUJ.

-Central full thickness tear of TFC

-Ulnar sided and DRUJ synovitis

Arthroscopy Treatment

-Central Unstable tear with flap

-Debridement

-Radiofrequency ablation, saucerization

Palmer 1A vs 2C
(acute on chronic)

Recap

- 9 components to the TFCC
- Palmer Classification
- Not all abnormalities of TFCC are symptomatic, important to correlate with clinical history
- Important to describe the injured structures
- MR Arthrography and higher MR field strengths are superior in detecting full thickness TFCC tears
- Lower sensitivity and accuracy for peripheral tears
- But arthroscopy remains the gold standard
- If Dx is missed progressive instability of DRUJ, OA, loss of motion, pain, loss of grip strength, ADLs

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