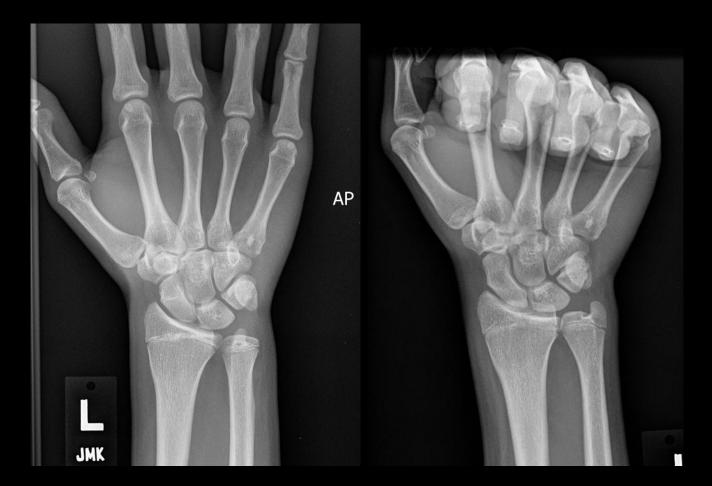


15yo high school lacrosse player with mid-dorsal wrist pain for 2 years. Relieved by rest. Exacerbated by loadbearing and hyperextension.











Ulnar Abutment Syndrome aka Ulnar Impaction Syndrome

A spectrum of degenerative conditions arising from chronic impaction of the ulnar head, TFCC, and ulnar carpus.

Ulnar Abutment Syndrome

Clinical Features

- Ulnar-sided wrist pain
- Swelling
- Limited ROM
- Exacerbated by activity, especially positions that increase axial loading to the ulnar aspect of the wrist (grip, pronation, ulnar wrist deviation)

Caution: Long ddx for ulnar-sided wrist pain (e.g. OA, fracture, dislocation, ligamentous injuries, AVN etc.)

Ulnar Abutment Syndrome

- Usually occurs in positive ulnar variance
- Predisposition
 - Congenital positive ulnar variance
 - Malunion of distal radius fracture
 - Premature physeal closure of the distal radius
 - H/o radial head resection
 - Unrecognized Essex-Lopresti leading to gross instability of DRUJ

Ulnar Abutment Syndrome Radiographic Features

- Positive ulnar variance
- Subchondral sclerosis, cystic changes, later advanced degenerative changes in:
 - ulnar head
 - proximal ulnar aspect of the lunate
 - proximal radial aspect of the triquetrum

Ulnar Abutment Syndrome MRI Features

- Cartilage fibrillation in the ulnar head and ulnar carpus
- Bone hyperemia
- Bone sclerosis
- TFCC tear
- Lunotriquetral ligament disruption

Palmer Classification of TFCC Abnormalities

Class 1: Traumatic	Class 2 Degenerative (Ulnocarpal abutment syndrome)
A: Central perforation	A: TFCC wear
B: Ulnar avulsion	B: A + Lunate and/or ulnar chondromalacia
With distal ulnar fracture	C: TFCC perforation
	+ Lunate and/or ulnar chondromalacia
Without	D: C + LT ligament perforation
C: Distal avulsion	E: D + Ulnocarpal arthritis
D: Radial avulsion	
Without sigmoid notch fracture	
Without	

Ulnar Abutment Syndrome Proper PA Radiograph of the Wrist



Wrist in neural forearm rotation Elbow flexed 90° Shoulder abducted 90° Elbow at shoulder height

Smooth carpal arcs x3 ECU groove projects radial to base of ulnar styloid.



http://www.radiologyassistant.nl/en/p476a23436683b/wrist-fractures.html

Ulnar Abutment Syndrome Pronated Grip View



http://juniperpublishers.com/oroaj/pdf/OROAJ.MS.ID.555593.pdf

In asymptomatic individuals, ulnar variance increases an average of 1.95 mm in pronated grip view.

Similar numbers in symptomatic individuals.

Ulnar Abutment Syndrome Ulnar Variance – General Concepts

 Maximum positive ulnar variance occurs in Forearm pronation + Grip

... ...

- In the native forearm, Radius : Ulna share approximately 80:20 axial loading
- Increased ulna loading in wrist pronation, flexion, and ulnar deviation (Ekenstam Acta Orthop Scand 1984)
- <u>Weak correlation between positive ulnar variance and increased</u> <u>ulnar force transmission</u> in surgery-naive forearms. However, surgical radius-shortening or ulnar-lengthening does lead to statistically significant increase in ulnar loading. (Werner J Hand Surg Am 1992)
- Inverse relationship between ulnar variance and TFCC thickness. (Palmer J Hand Surg Am 1984)

Intricate, dynamic force distribution in the distal forearm at different positions of rotation of the radius around the ulna, with dynamic changes in TFCC morphology, and other anatomic considerations.

Ulnar variance is only one player.

Ulnar Variance - Clinical Application

- Positive ulnar variance is associated with poorer outcome following TFCC debridement alone. (Minami *J Hand Surg* 1996)
- In patients with persistent ulnar wrist pain following TFCC debridement and no significant ulnar variance, second-stage ulnar shortening has been shown to be effective. (Hulsizer J Hand Surg Am 1997)
- Ulnar shortening osteotomy alone has been shown to be efficacious in treatment of TFCC tears associated with positive ulnar variance (Minami J Hand Surg 1998)

Recommendation: Obtain both neutral forearm rotation and pronated grip for treatment planning of causes of ulnar-sided wrist pain that may be affected by ulnar variance.

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