THE UNIVERSITY OF KANSAS HEALTH SYSTEM

Shoulder Treatment in the Office

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Disclosure Information

- No disclosures pertaining to this subject.

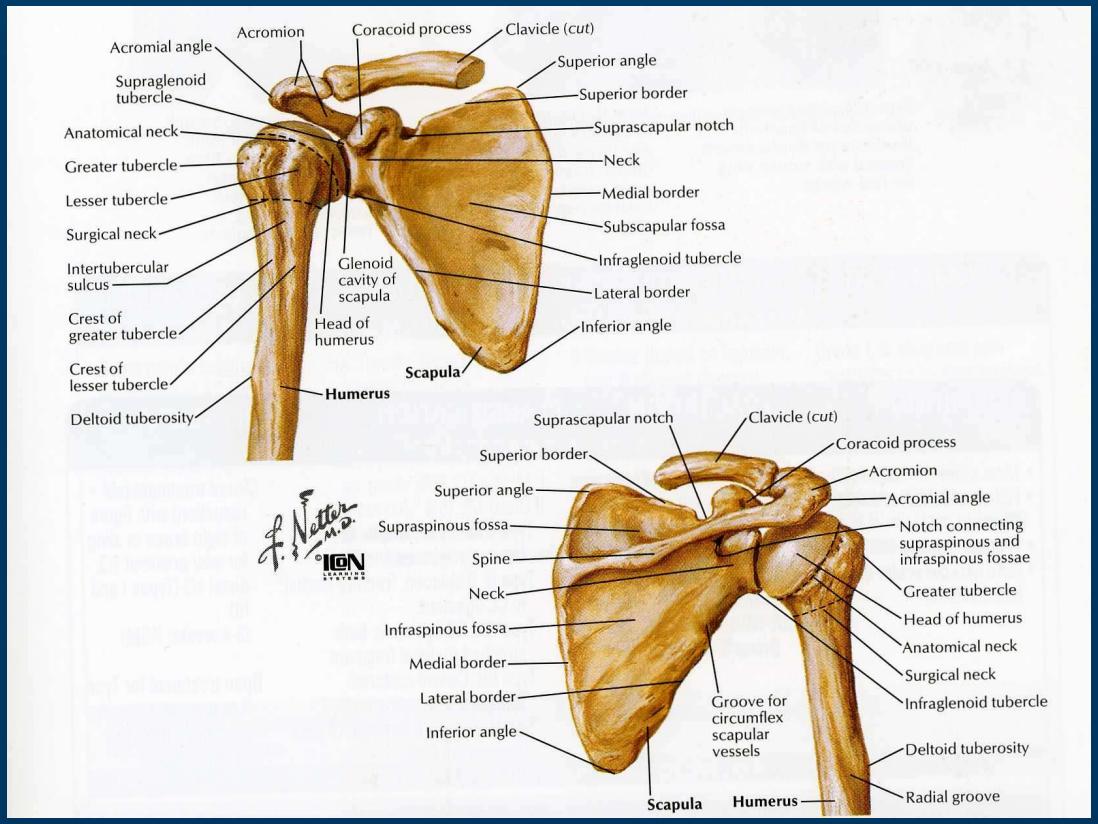
Overview

- Shoulder Anatomy
- Physical Exam
- How to diagnosis/manage common shoulder pathologies (not all) in clinic
  - Shoulder impingement
  - Rotator Cuff tears
  - Biceps tendonitis
  - Scapulothoracic Dyskinesis
  - Calcific Tendonitis
  - Adhesive Capsulitis
  - Shoulder OA
  - RC Arthropathy

Epidemiology

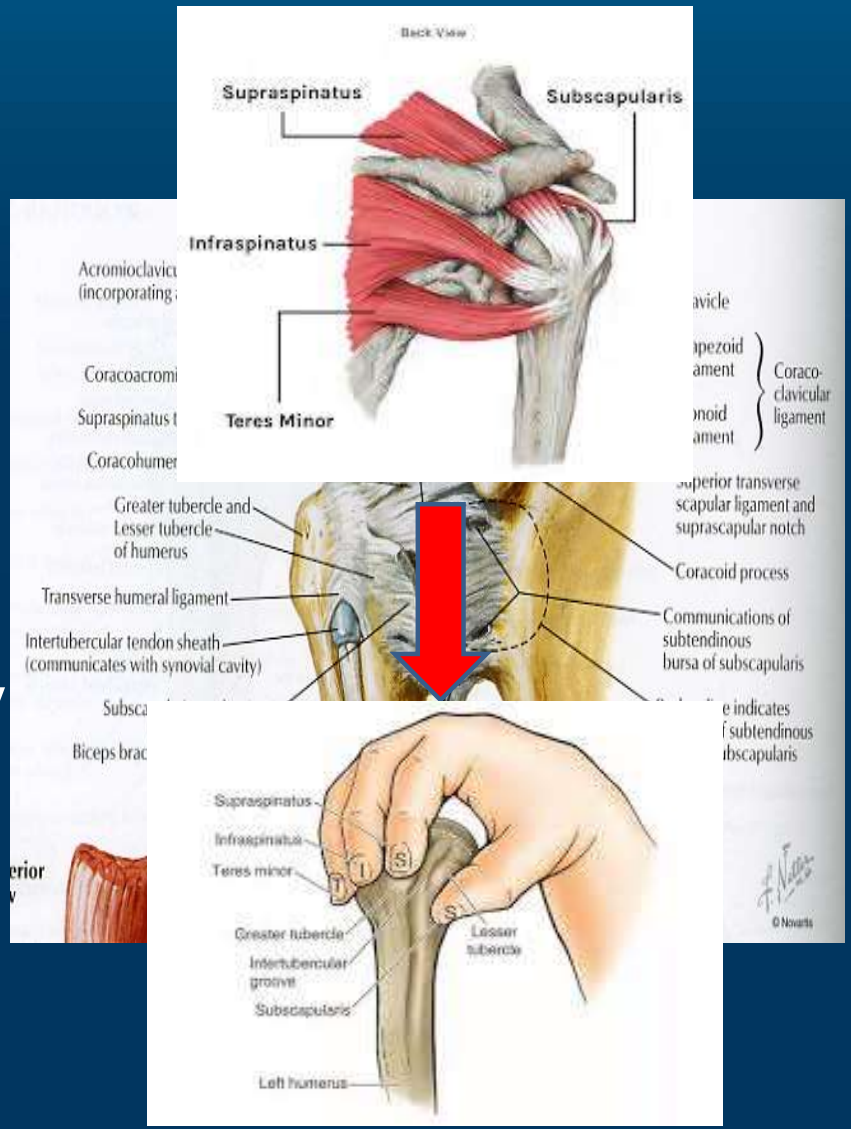
- Prevalence of shoulder pain is estimated to be 16% - 26%
- 3rd most common MSK consultation to primary care
- 1% of adults consult a general practitioner with new shoulder pain

Shoulder Anatomy



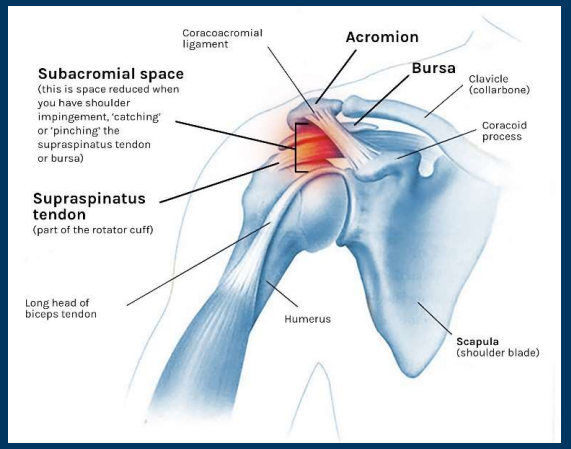
Glenohumeral Stability

- Static Restraints
  - Glenohumeral Ligaments
  - Glenoid Labrum
  - Articular congruity & version
  - Negative intraarticular pressure
    - If released head will sublux inferiorly
- Dynamic Restraints
  - RC muscles
  - Biceps Long tendon
  - Periscapular Muscles



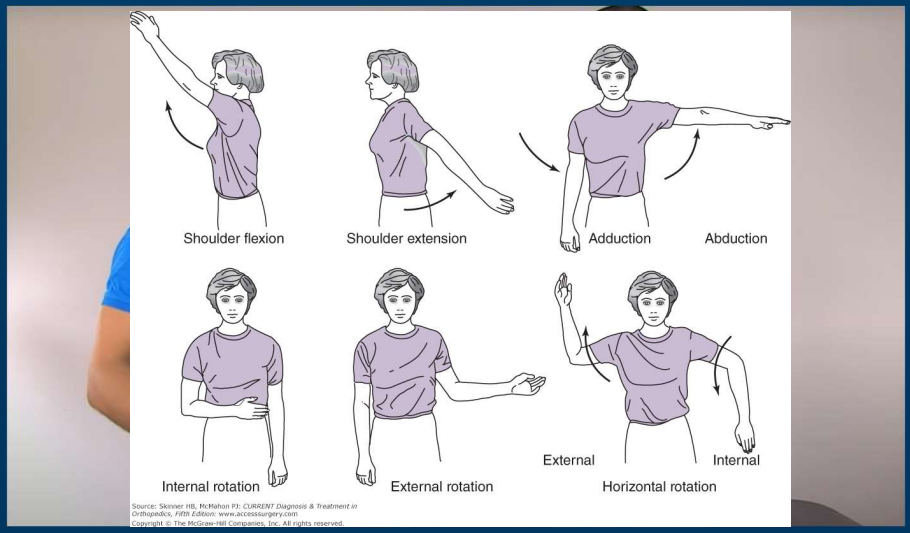
Shoulder (subacromial) Impingement

- Is one of the most common cause of shoulder pain (44-65%)
- Caused by compression of RC by superior structures (acromion, CA. ligament, ACJ)
- Often times gets subcategorized with RC Tendonitis & Bursitis
- History?
  - Usually overuse injuries
    - Overhead athlete & labors
  - Chronic
- Beginning stages of further RC pathology?
- Symptoms
  - Pain with different shoulder positions
  - Pain down the deltoid region



Shoulder (subacromial) Impingement

- PE:
  - Usually good strength/ROM
    - Often times pain w/ ROM
  - Jobe Test
    - Pain but good strength
  - + Neers
  - +Hawkins
- Imaging
  - XRs
  - MRI
    - Usually don't order unless failed non-operative treatment
      - Unless has weakness on exam or traumatic injury



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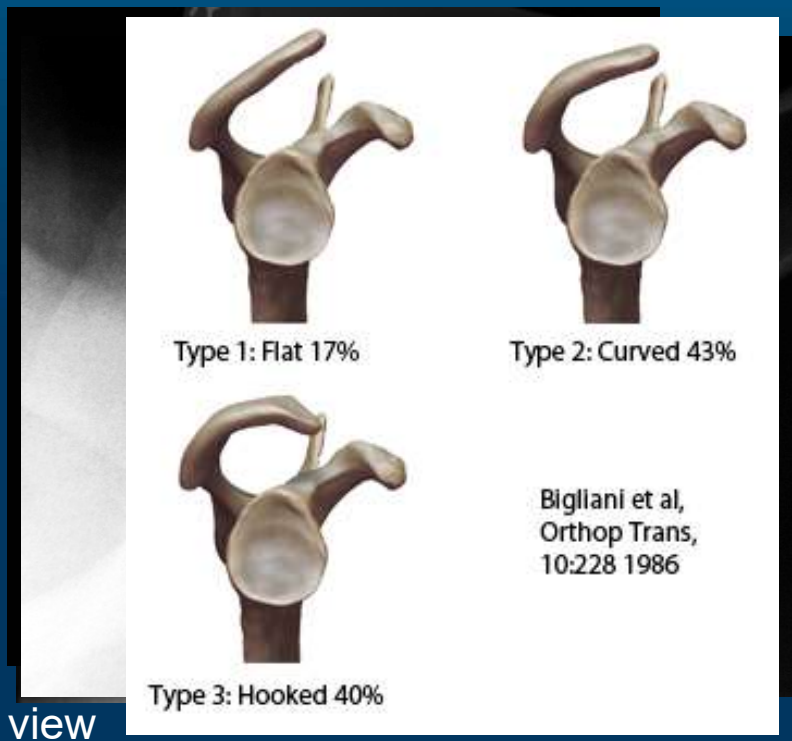
Imaging

- XRs
  - Standard views
    - AP
    - Grashey
    - Scapular Y
    - Axillary (& Grashey are the most important)
  - Usually negative
  - Can sometimes see Type II & III acromion on Scap-Y view
  - MRI
    - Usually don't order unless failed non-operative treatment
      - Unless has weakness on exam or traumatic injury



Shoulder (subacromial) Impingement

- Treatment (majority of these are successfully treated non-op)
  - Activity modification
  - NSAIDs & acetaminophen
  - Exercise Therapy
    - Formal PT & Home Therapy
  - Acupuncture vs. Ultrasound vs. Laser
    - Seems to be patient specific
    - Studies shown best evidence for exercise therapy
  - Subacromial Injections
    - Ultrasound?
      - Most benefit w/ Biceps injections
    - Steroid
    - NSAID Injection
      - Found no difference vs. steroid
    - PRP (leu poor)
      - No difference w/ pain vs. CS
      - Potentially better Abduction at 1 yr
  - Surgery → only when everything else fails…

Rotator Cuff Tears

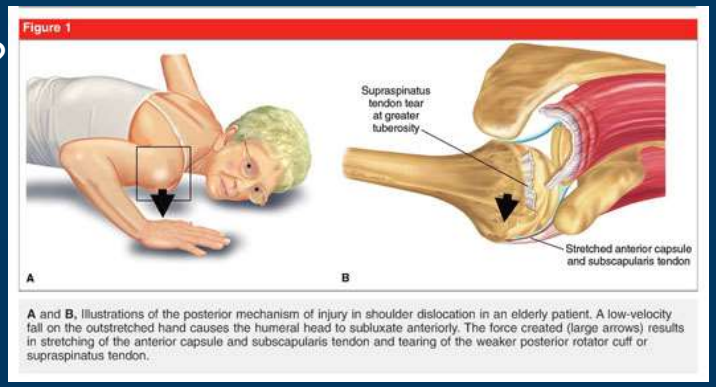
- Prevalence
  - >60 → 28% have full-thickness tears
  - >70 → 65% have full-thickness tears
- So how do we management all these tears?

Rotator Cuff Tears

- Not every RC tear is the same!
  - HPI?
    - Traumatic vs. Atraumatic?
    - How long has this been going on?
    - What's the pt's symptoms?
      - » Symptomatic vs Asymptomatic?
      - » Weakness?
      - » ↓ ROM?
      - » Pain?
      - » Night time pain? (sleep?)
    - Occupation?
    - Co-morbidities?
      - » Smoker?
      - » Diabatic?
  - PE?
    - ↓ Strength?
    - What's the PROM & AROM?
    - Pseudoparalysis?
    - Any other signs of other pathologies
      - » Cervical Radiculopathy?
      - » Other shoulder pathologies (biceps and etcs...)
  - What does their Imaging show?
    - Joint Space?
    - Partial vs Thickness?
    - RC atrophy?

Rotator Cuff Tears

- Traumatic
  - An event that caused the injury or caused the symptoms?
    - Fall?
    - Shoulder Dislocation?
      - >40 y/o → 35% have RC tears
      - >60 y/o → 80% have RC tears
- Atraumatic
  - Usually intrinsic degermation is primary etiology
  - Seen in the older population
  - Chronic impingement?
  - Usually symptoms going on for a long time w/o any traumatic event

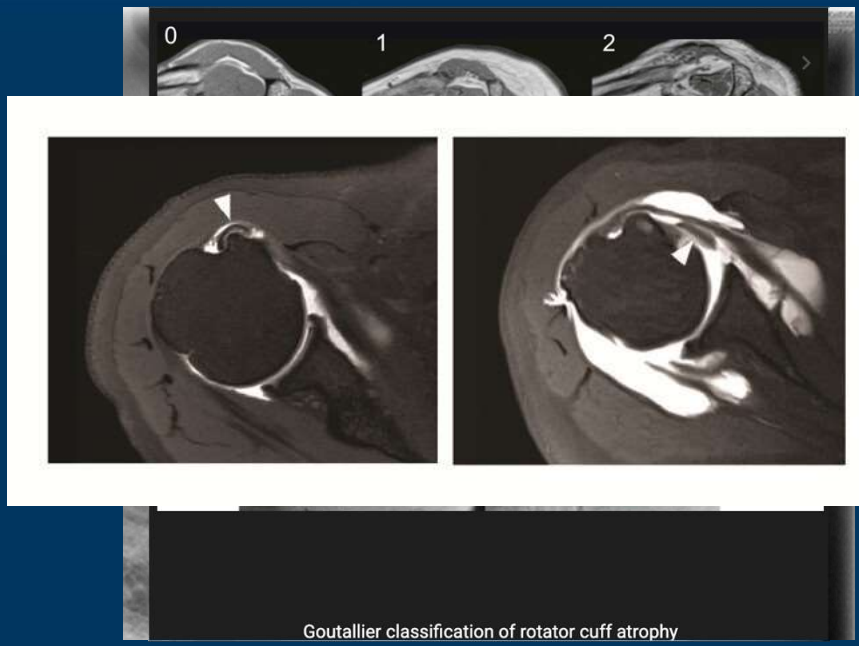


Rotator Cuff Tears

- Physical Exam
  - Usually ↓ AROM (not always) but good PROM
    - Psedudoparalysis?
    - Pain with some ROM maneuvers
      - IR behind back
  - RC strength?
      - Jobes
        - » Pain & weakness?
        - » Sometimes just pain
      - Drop Arm test
      - ER
      - Bear hug
      - Lift off test
      - Belly press test
  - Often times have associated biceps tendonitis symptoms
    - Tenderness over BG
    - +Speeds
    - +Yergasons Test

Rotator Cuff Tears

- XRs
  - Standard four view series
- Ultrasound?
  - Good for diagnosing
    - Not as good to determines severity of injury/quality of tissues
- MRI
  - Order when
    - Traumatic injury
    - Weakness on exam or failed conservative treatment
  - Evaluate for
    - Full thickness vs. Partial?
      - Bursal sided vs. articular sided?
    - How much is the tendon retracted?
    - Is the biceps medially dislocated?
    - Rotator cuff atrophy?
      - T1 Sagittal
  - Pacemaker?
    - CTA or Ultrasound



Rotator Cuff Tears

- Treatment
  - Non-operative treatment
    - First-line for
      - Atraumatic
      - Asymptomatic
      - Chronic
      - Low demand or poor surgical candidates
    - Monitor these patients
      - 61% of RCTs had progressed at 3.2 yrs
        - » 74% full-thickness progressed
        - » 42% partial-thickness progressed
        - » 29% partial-thickness progressed to full-thickness
        - » Full thickness tears & subscapularis involvement were correlated w/ progression
    - How many steroid injections?
      - One injection → will likely not compromise outcomes
      - Multiple → increase progression vs. compromise future surgical outcomes

JSES Int. 2023 Nov 23;8(1):75-79. doi: 10.1016/j.jseint.2023.10.013. eCollection 2024 Jan.

Corticosteroid injection prior to surgery had no effect on 2-year outcomes following arthroscopic rotator cuff repair

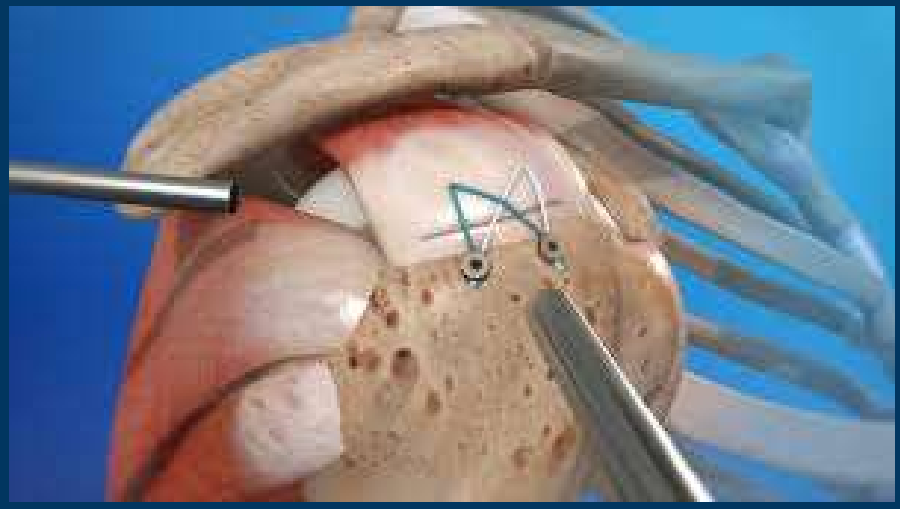
Justin T Smith [1], Stephan G Pill [1], Kailey A Eggert [2], Calleigh G Brignull [2], Kyle J Adams [3], Douglas J Wyland [1], Stefan J Tolan [1], Charles A Thigpen [4 5], Michael J Kissenberth [1]

Affiliations + expand

PMID: 38312263 PMCID: PMC10837736 DOI: 10.1016/j.jseint.2023.10.013

Rotator Cuff Tears

- Treatment
  - Operative
    - Traumatic
      - Symptomatic
      - Especially w/ subscap involvement
    - Failed non-operative treatment
    - Pseudoparalysis

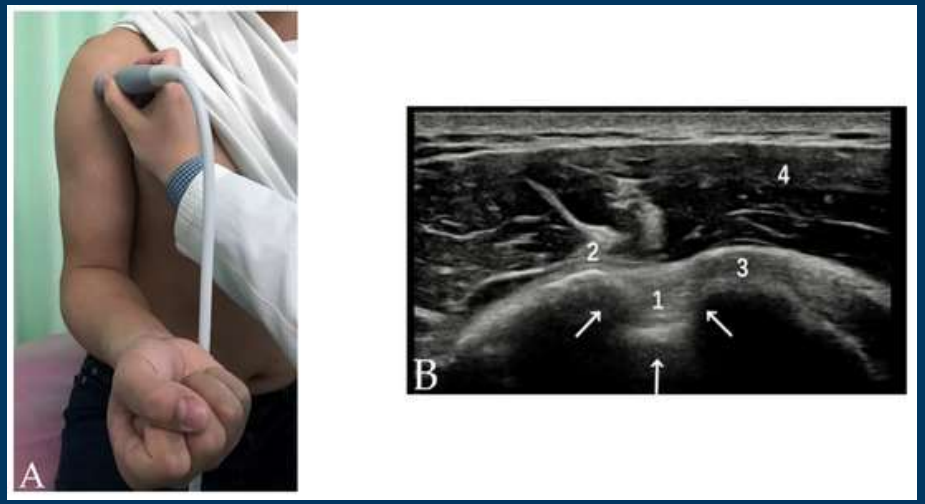


Biceps Tendonitis

- Often times can be associated with other pathologies
  - OA
  - Shoulder impingement
  - RC pathology
    - Especially subscap
- Symptoms
  - Anterior shoulder pain
    - Over the bicipital groove
  - may radiate down the biceps
  - Can be similar to RC & shoulder impingement
- PE
  - +tenderness over BG
  - Can have pain with the following
    - Speeds
    - O'brien's test
    - Yergason's
  - Proximal popeye deformity?

Biceps Tendonitis

- Majority of the Diagnosis is on physical exam
- XRs → standard series
- MRI vs. Ultrasound?
  - Usually don't order unless failed non-operative treatment or weakness
- Treatment
  - Non-operative
    - Voltaren
    - NSAIDs
    - PT
    - BG ultrasound injection
  - Surgery
    - Failed initial non-op treatment
    - Tenodesis vs. Tenotomy



Scapulothoracic Dyskinesis

- Abnormal scapula motion leading to shoulder impingement & dysfunction
  - Leads to protraction of scapula
- Commonly seen in athletes (throwing athletes)
- Causes
  - Periscapular muscle fatigue
  - Poor throwing mechanics
  - Secondary to pain (shoulder, neck)
  - Neurologic injury
- Increase risk of injuring
  - Labrum
  - RC
  - Capsule

Scapulothoracic Dyskinesis

- Symptoms
  - Shoulder pain worse w/ arm elevation
  - Loss of throwing velocity
- Exam
  - Tenderness over coracoid
  - Scapula may be lower & protracted
    - Can be seen with pushup & resisted forward flexion
- Treatment
  - What's the cause?
  - Home or formal PT focusing on peri-scapular training
  - Work on Posture
    - Posture shirts?

Calcific Tendonitis

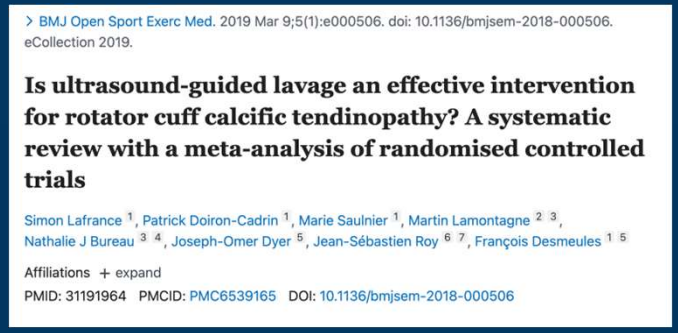
- Calcium hydroxyapaptite crystals deposited into the RC insertion
- Cause unknown
- More common in females
- Typically affects pt's 30 – 60 y/o
- Associated w/
  - Diabetes
  - Hypothyroidism
- History
  - Like subacromial impingement but pain may be more severe
- Symptoms
  - atraumatic pain
  - Pain w/ ROM → ↓ROM
  - Catching/crepitus

Calcific Tendonitis

- PE
  - Usually good RC strength
    - However usually guarded on exam & pain with RC tests
      - Resulting in subjective weakness and hard to test strength on exam
  - Have ↓ AROM/PROM secondary to pain
  - May have scapular dyskinesia secondary to guarding
- Imaging
  - X-rays
    - Standard series
      - This & history/exam is usually all you need for diagnosis
  - Ultrasound
  - MRI
    - Usually don't order unless failed non-op or uncertain if traumatic injury

Calcific Tendonitis

- Treatment
  - NSAID/Acetaminophen
  - Formal PT w/ home exercises/stretching
  - Extracorporeal shock-wave therapy
    - May be beneficial at early stage of disease
  - Steroid injection
    - Usually subacromial
    - May/ may not help
  - Ultrasound-guided needle Lavage
    - May be more effective than shockwave therapy or CS injection alone
  - Resolution of symptoms → 60-70% within 6 months
    - Worse outcomes w/
      - Increase size of calcification
      - Deposits that are more medial
  - Surgical
    - If Symptoms persist over 6 months w/ no improvement
    - Arthroscopic decompression



> BMJ Open Sport Exerc Med. 2019 Mar 9;5(1):e000506. doi: 10.1136/bmjsem-2018-000506. eCollection 2019.

Is ultrasound-guided lavage an effective intervention for rotator cuff calcific tendinopathy? A systematic review with a meta-analysis of randomised controlled trials

Simon Lafrance [1], Patrick Doiron-Cadrin [1], Marie Saulnier [1], Martin Lamontagne [2 3], Nathalie J Bureau [3 4], Joseph-Omer Dyer [5], Jean-Sébastien Roy [6 7], François Desmeules [1 5]

Affiliations + expand

PMID: 31191964 PMCID: PMC6539165 DOI: 10.1136/bmjsem-2018-000506

Adhesive Capsulitis (Frozen Shoulder)

- Pathoanatomy
  - Inflmmatory process causing fibroblastic proliferation of the joint capsule leading to thickening, fibrosis, adherence of the capsule to itself/humerus
- More common in females
- Usually ages 40-60 yrs of age
  - Under than 50 yrs of age
    - Have ↑ risk of the contralateral side
- Causes
  - Most idiopathic
    - Association w/ diabetes & thyroid disorders, dupytren's disease
  - Post-traumatic
    - Proximal humerus fx (GT fxs)
    - Prolonged immobilization
  - Post-surgical
    - RCR
    - Post Radiation syndrome
- Having it on one side ↑ your risk on having it the other side

Adhesive Capsulitis (Frozen Shoulder)

- Symptoms
  - Usually atraumatic gradual increase in shoulder pain then resulting in noticeable loss of ROM
    - Usually difficultly w/ sleeping
  - As disease progresses → pain may resolve but still have limited ROM
  - May take up to 12-18 months to fully resolve
    - ROM
      - Abduction/FF usually first to come back
      - ER & IR the last to come back
- PE:
  - Loss of both AROM/PROM of the shoulder
    - Limitations may be slight → ER deficit most common finding
  - Painful but usually good strength w/ RC
- Imaging
  - XR
    - Helps you differentiate from OA
  - MRI → usually not needed if good strength on exam.
- Labs
  - May be the first sign of other diseases
  - May consider ordering metabolic panel & endocrine labs (TSH & A1c)

Adhesive Capsulitis (Frozen Shoulder)

- Treatment
  - NSAIDs/Acetaminophen
  - Formal PT & home exercises
  - Steroid Injection
    - Intra vs. Subacromional?
  - Hydrodilatation
    - Idiopathic cases
    - Diabetes usually have inferior outcomes
  - Often best treatment → time…
  - Surgical
    - MUA with arthroscopic capsule release
      - Indication
        - » Over 6-9 months w/ failed non-operative treatment

Biomed Res Int. 2019 Oct 15;2019:1274790. doi: 10.1155/2019/1274790

Intra-Articular versus Subacromial Corticosteroid Injection for the Treatment of Adhesive Capsulitis: A Meta-Analysis and Systematic Review

Xiaoke Shang [1,2], Zhong Zhang [2], Xuelin Pan [2], Jian Li [2], Qi Li [2,✉]

Author information · Article notes · Copyright and License information

PMCID: PMC6815644 PMID: 31737653

Br Med Bull. 2023 Jul 26;147(1):121–147. doi: 10.1093/bmb/ldad018

Efficacy of hydrodilatation in frozen shoulder: a systematic review and meta-analysis

Daryl Poku [1,b], Rifat Hassan [2,b], Filippo Migliorini [3,4], Nicola Maffulli [5,6,7,✉]

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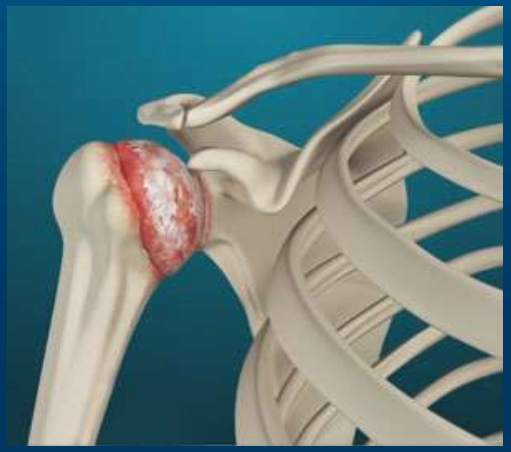
PMCID: PMC10788845 PMID: 37496207

Types of Shoulder Arthritis

- Primary (“wear & tear”)
- Secondary
  - Rotator Cuff Arthropathy
  - Inflammatory Arthritis (RA)
  - Inflammatory/Crystalline Arthritis
  - AVN
  - Post-traumatic
  - Neuropathic (Charcot Arthropathy)



Primary Osteoarthritis ("wear & tear")

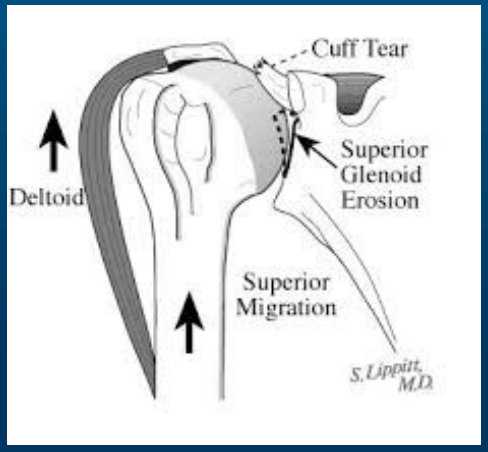
- Cause
  - Unknown
  - Genetic?
- Pathophysiology
  - Irreversible progression loss of articular cartilage w/ hypertrophic reaction of subchondral bone
- Presentation
  - Chronic (atraumatic?)
  - Shoulder pain → worse w/ activities & pain at night
  - ↓ ROM

Primary Osteoarthritis ("wear & tear")

- Physical Exam
  - ↓ both PROM & AROM
    - Especially w/ ER
  - Crepitus & tenderness w/ ROM
  - Usually Good strength when accessing RC
    - Jobes
    - ER
    - Bear hug
    - Lift off test
    - Belly press test
  - Often times have associated biceps tendonitis symptoms
    - Tenderness over BG
    - +Speeds
    - +Yergason's

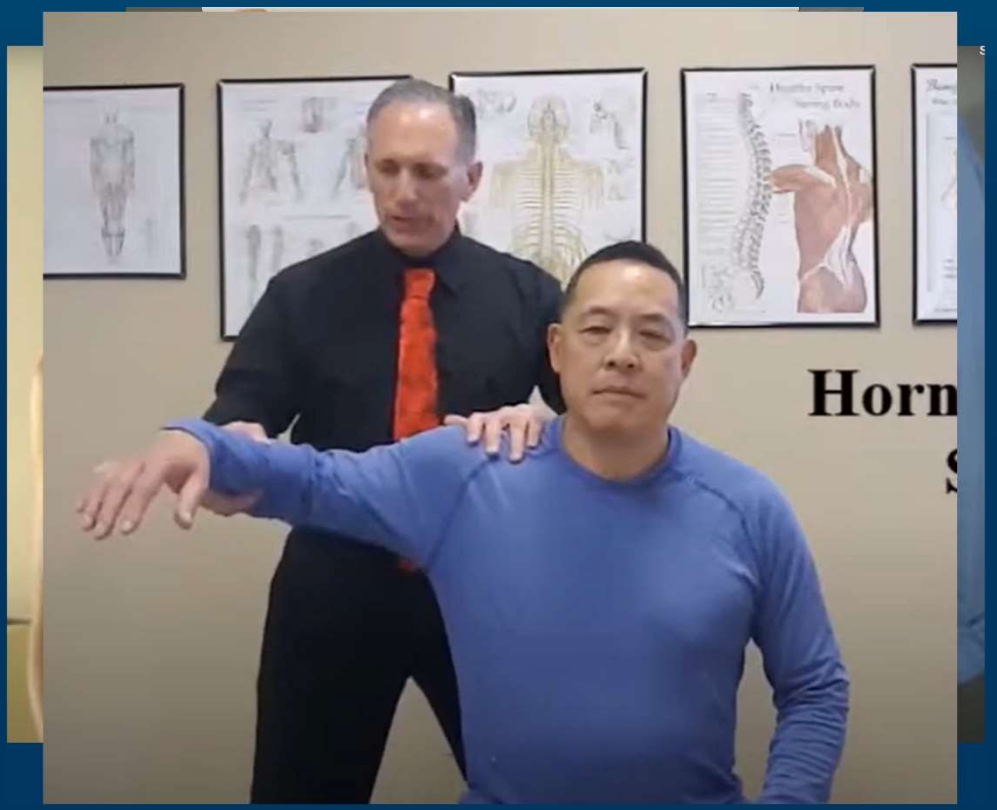
Rotator Cuff Arthropathy

- Pathophysiology
  - Loss of Dynamic Compression from RC insufficiency
    - → abnormal GH wear & Superior Migration of the Humeral Head
- Risk factors
  - RC tear
  - Inflammatory Arthritis (RA)
  - Cystalline-induced Arthropathy
  - Hemorrhagic Shoulder
- Presentation
  - Usually older patients (7th decade, but not always…)
  - Shoulder Pain
  - Subjective Weakness & Stiffness



Rotator Cuff Arthropathy

- Physical Exam
  - Inspection
    - supraspinatus/infraspinatus atrophy
  - Limited AROM/PROM
  - Crepitus w/ ROM
  - Pseudoparalysis
  - RC insufficiency Test
    - ER Lag Sign
    - Hornblower Sign



Imaging Findings for Primary OA

- XRs
  - Joint space narrowing
  - Subchondral Cysts
  - Osteophytes
    - “Goats beard deformity”
  - Posterior Wear of Glenoid (axillary view)
- MRI
  - 5-10% RC Tear

Imaging Findings for Rotator Cuff Arthopathy

- XRs
  - Humeral Head Migration
  - Acromial Acetabularization
  - Asymmetric superior glenoid wear
- MRI
  - Irreparable RC tear w/
    - Severe retraction
    - Massive fatty infiltration

First Line of Treatment → Non-op

- Activity Modification
- NSAIDs & Acetaminophen
- PT
- "Is there supplementations that can help?"
  - Turmeric?

Review > BMJ Open Sport Exerc Med. 2021 Jan 13;7(1):e000935.
doi: 10.1136/bmjsem-2020-000935. eCollection 2021.

Therapeutic effects of turmeric or curcumin extract on pain and function for individuals with knee osteoarthritis: a systematic review

Kristopher Paultre [1 2], William Cade [2], Daniel Hernandez [3], John Reynolds [4], Dylan Greif [2],

Injections

- Ultrasound guidance?
  - Primary OA → Intraarticular
  - RC Arthropathy → Subacromial
- Steroid
  - VAS Pain → can improve up to 12 months
  - Function Improve → 4 months
  - Severity of OA did not affect duration of relief
- Hyaluronic acid
  - Mixed results
  - Not FDA approved for shoulder
- PRP Leu Poor
  - PRP vs. HA
    - No difference in pain & functional outcomes
    - Both illustrated significant improvements in both pain & fur

J Shoulder Elbow Surg. 2021 May;30(5):1128-1134. doi: 10.1016/j.jse.2020.08.008. Epub 2020 Aug 25.

Efficacy of a single, image-guided corticosteroid injection for glenohumeral arthritis

Cameron M Metzger [1], Hassan Farooq [2], Gregory A Merrell [3], F Thomas D Kaplan [3], Jeffrey A Greenberg [3], Nicholas E Crosby [3], Kathryn M Peck [3], Reed W Hoyer [4]

Randomized Controlled Trial · Clin J Sport Med. 2022 Nov 1;32(6):558-566. doi: 10.1097/JSM.0000000000001029. Epub 2022 Mar 17.

Efficacy of Ultrasound-Guided Glenohumeral Joint Injections of Leukocyte-Poor Platelet-Rich Plasma Versus Hyaluronic Acid in the Treatment of Glenohumeral Osteoarthritis: A Randomized, Double-Blind Controlled Trial

Jonathan S Kirschner [1], Jennifer Cheng [1], Andrew Creighton [1], Kristen Santiago [1], Nicole Hurwitz [1], Mark Dundas [2], Nicholas Beatty [3 4], Dallas Kingsbury [5], Gabrielle Konin [6], Zafir Abutalib [7], Richard Chang [3]

Affiliations + expand

PMID: 35316820 PMCID: PMC9481749 DOI: 10.1097/JSM.0000000000001029

Summary

- Majority of shoulder pathologies can be diagnosed by history/exam
- A lot of common causes of shoulder pain can be successfully managed initially w/ non-op treatment
- Rotator cuff tears are common, but not all are the same or need surgery
  - Be aware of traumatic RCTs, especially after shoulder dislocations in the older population
  - Continue to monitor atraumatic RCTs for progression.

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Questions?

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