Triaging the Injured Worker

Tear or Tendinopathy? Understanding the Spectrum of Rotator Cuff Pathology

Nathan L. Van Zeeland, MD

HAND to SHOULDER CENTER of wisconsin

1

Learning Objectives

- Gain a basic understanding of rotator cuff anatomy
- Understand the difference between rotator cuff tendinopathy and rotator cuff tears
- Learn early treatment algorithms when dealing with an injured worker with shoulder pain
- Learn clinical history and exam findings that alert you to consider subspecialty referral
- Appreciate the role of nonoperative modalities to treat shoulder injuries
- Learn the role of surgical intervention for shoulder injuries
- Understand postoperative rehabilitation and return to work strategies after surgery of the shoulder

2

Rotator Cuff Anatomy

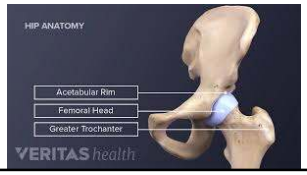
- "Rotary Cup"

https://volumetrictechnologies.com/rotary-cup-filling-machines/

3

Rotator Cuff Anatomy

- Ball and Socket Joint
- Comparative Anatomy to Hip
- Less bony constraint, allowing for increased range of motion
- Highly reliant on soft tissues (labrum, capsule, muscle and tendon) for stability and range of motion



4

Rotator Cuff Anatomy

Supraspinatus-Abduction

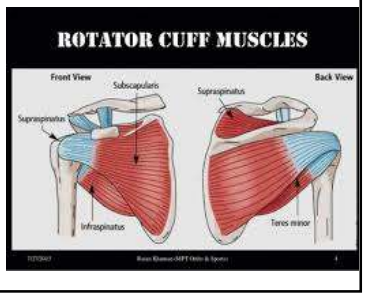
Infraspinatus-External Rotation

Teres Minor-External Rotation

Subscapularis-Internal Rotation

Dynamic glenohumeral stabilizers

Scapulohumeral Rhythm (2:1)



5

Rotator Cuff Anatomy

- Supraspinatus-Shoulder Abduction/Forward Elevation

6

Rotator Cuff Anatomy

- Infraspinatus-External Rotation

7

Rotator Cuff Anatomy

- Teres Minor-External Rotation

8

Rotator Cuff Anatomy

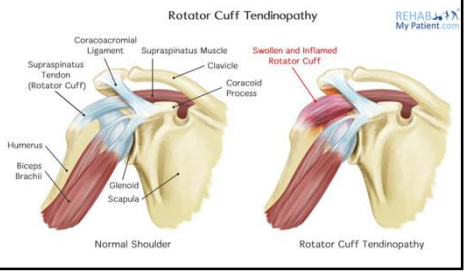
- Subscapularis-Internal Rotation

9

Rotator Cuff Pathology: Tendinopathy

- Impingement
- Cuff Tendonitis
- Cuff Tendinosis
- Subacromial Bursitis

- Structural Integrity of rotator cuff and its insertion are intact, but inflamed/tendinopathic



10

Rotator Cuff Pathology: Tear

- Structural Integrity of Rotator Cuff is disrupted
- Tear of Insertion to Greater Tuberosity
- Intratendinous (less common)
- Partial vs Full-Thickness

11

Tendinopathy vs Tear: Why does it matter?

- Tendinopathy is REVERSIBLE
  - Nonoperative management is standard of care
- Rotator Cuff tears DO NOT HEAL back to the greater tuberosity
  - Surgery often indicated
  - Even though pain and function may improve, tear is still there
  - Tears tend to enlarge over time
  - As tears enlarge, they become more painful/symptomatic
  - Longstanding tears lead to muscle atrophy and retraction of the tendon
    - May not be repairable after certain period of time

JBJS 2015. A prospective evaluation of survivorship of asymptomatic degenerative rotator cuff tears. J Keener, et al

12

Tendinopathy vs Tear: Comparison

Tendinopathy
- Often insidious onset
- Overuse or excessive abduction or overhead activities
- Painful arc of motion, especially reaching behind back
- Pain at night
- Subacromial crepitus with motion

Tear
- Acute Onset
- Discrete event
- Felt a "pop"
- Often excruciating pain first night
- Difficulty lying flat
- Pain/Inability to move shoulder
- Subacromial crepitus with motion

13

Rotator Cuff Work Injury: History

- Details of the Injury
  - Slow, progressive or sudden, acute injury
  - High energy injury or fall
- Any previous surgery or pain?
- Pain Assessment
  - Subjective and variable
- Sleep quality the night of injury
- Ability to use arm with activities after the injury

14

Rotator Cuff Work Injury: Exam

15

Rotator Cuff Work Injury: Management

- **"RED FLAGS"**
  - High energy mechanism of injury
  - Significant pain over a bony structure
  - Complete inability to raise the arm
  - Obvious deformity
  - Neurovascular compromise
- More common presentation
  - Painful, but intact, arc of motion
  - Pain reaching behind back
  - Fatigue or weakness with reaching or overhead activities
  - Difficulty/inability to sleep at night

16

Rotator Cuff Work Injury: Management

- **"RED FLAGS"**
  - Consider urgent referral
  - Plain radiographs very important
    - Fracture
    - Dislocation
    - AC separation
    - Calcific tendonitis
    - Osteoarthritis
    - Os acromiale
  - Rule out neurovascular compromise

17

Rotator Cuff Work Injury: Management

- Initial conservative care
  - Sling for comfort
  - Pendulum exercises
  - Ice
  - NSAIDs
  - Rest
  - Work Restrictions
- Reassess in 1-7 days; repeat exam
  - If improving, consider PT for 2-6 weeks
  - Slowly advance work restrictions
- If pain persists, or concerning exam, refer to orthopedics

18

Rotator Cuff Work Injury: Orthopedic Workup

- Repeat History
  - Consistent story?
  - Determine work-relatedness
- Repeat Exam
  - Assess for concerning "amplification" beyond objective findings
  - Inability to raise arm
  - Pseudoparalysis
  - Scapular substitution
- Plain Radiographs
  - 4 views

Tendinopathy or Tear???

19

Rotator Cuff Tendinopathy: Treatment

- NSAIDs
- Physical Therapy
- Work Restrictions
- Subacromial Steroid injection
  - Only if low suspicion of cuff tear
  - Works best in concert with Physical Therapy regimen
  - Ultrasound Guidance

Video of ultrasound guided subacromial steroid injection

20

Tendinopathy: Conservative Outcomes

- 2020 Mar;50(3):131-141.

doi: 10.2519/jospt.2020.8498. Epub 2019 Nov 15.

An Update of Systematic Reviews Examining the Effectiveness of Conservative Physical Therapy Interventions for Subacromial Shoulder Pain

Louise Pieters, Jeremy Lewis, Kevin Kuppens, Jill Jochems, Twan Bruijstens, Laurence Joossens, Filip Struyf

Conclusion: There is a growing body of evidence to support exercise therapy as an intervention for subacromial shoulder pain.

21

Rotator Cuff Tendinopathy: Treatment

- Reassess in a month
- Monitor response to conservative care
  - Estimate % improvement, if at all
- Repeat exam

- If improved, slowly advance work restrictions and continue physical therapy
- Reassess monthly until goals met
- Lift restrictions
- Maximal Medical Improvement and Impairment Rating
  - Usually 0-3%

22

Rotator Cuff Tendinopathy: Outcomes

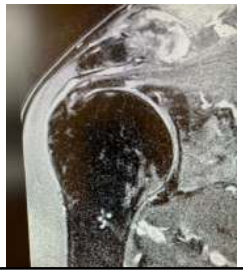
- Nonoperative treatment is gold standard
- Improve contributing factors
  - Ergonomics
  - Postural retraining
  - Scapular stabilization
  - Tight posterior capsule
  - Psychological factors, anxiety
- Vast majority of people improve with conservative care
- But, what if there is still pain???

Advanced Imaging

23

Rotator Cuff Injury: MRI

Rotator Cuff Tendinopathy



Rotator Cuff Tear

24

Role of Subacromial Decompression/Acromioplasty

- Option of absolute last resort without other contributing "pain generators"
- MINIMUM 6 months of appropriate conservative care
- Procedure involves excising subacromial bursa, releasing hypertrophic coracoacromial ligament and smoothing/flattening the anterolateral acromion

Arthroscopic Subacromial Decompression + Acromioplasty

25

Subacromial Decompression/Acromioplasty

- Subacromial decompression animation

https://youtu.be/KbZc_WUsBLM?si=BjcgWE-sewoTmcwF

26

Subacromial Decompression Outcomes

•SCIENTIFIC ARTICLE

Arthroscopic Acromioplasty: A Comparison Between Workers' Compensation and Non-Workers' Compensation Populations

Nicholson, Gregory P. MD

Author Information

The Journal of Bone & Joint Surgery 85(4):p 682-689, April 2003.

No differences in outcomes
Both improved function and pain scores
Workers Compensation took longer to return to work due to higher labor positions (13.7 vs 9.1 weeks)

27

Subacromial Decompression: Outcomes

Randomized Controlled Trial Lancet

. 2018 Jan 27;391(10118):329-338. doi: 10.1016/S0140-6736(17)32457-1. Epub 2017 Nov 20.

Arthroscopic subacromial decompression for subacromial shoulder pain (CSAW): a multicentre, pragmatic, parallel group, placebo-controlled, three-group, randomised surgical trial

David J Beard 1, Jonathan L Rees 2, Jonathan A Cook 3, Ines Rombach 3, Cushla Cooper 3, Naomi Merritt 3, Beverly A Shirkey 2, Jenny L Donovan 4, Stephen Gwilym 2, Julian Savulescu 5, Jane Moser 2, Alastair Gray 6, Marcus Jepson 4, Irene Tracey 7, Andrew Judge 2, Karolina Wartolowska 2, Andrew J Carr 8; CSAW Study Group

"The findings question the value of this operation for these indications, and this should be communicated to patients during the shared treatment decision-making process."

28

Subacromial Decompression: Outcomes

•. 2017 Jun;99-B(6):799-805.

doi: 10.1302/0301-620X.99B6.BJJ-2016-0569.R1.

Arthroscopic decompression not recommended in the treatment of rotator cuff tendinopathy: a final review of a randomised controlled trial at a minimum follow-up of ten years

S Ketola[1], J T Lehtinen[1], I Arnala[1]

- Average 12 year followup
- No difference in pain, disability, ability to work between subacromial decompression group and exercise-alone group
- But, greater PERCEIVED improvement in surgical group
- Consider placebo

29

Rotator Cuff Tear

- Full thickness rotator cuff tear
- Natural history of rotator cuff tear
- Typically, recommend surgical repair of rotator cuff

- Nonoperative management if patient has multiple medical comorbidities
- Massive, retracted tears with fatty atrophy may not be repairable

30

Rotator Cuff Repair

- Most commonly done arthroscopically
- Suture anchors used to repair tendon back to greater tuberosity
  - Single and double row techniques
- May also recommend addressing other "pain generators" in the shoulder
  - Biceps tendon
  - Acromioclavicular joint

31

Trivia answer removed

32

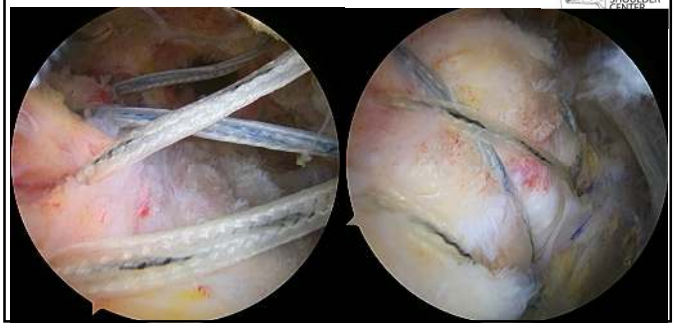
Rotator Cuff Repair

33

Rotator Cuff Repair

34

Rotator Cuff Repair



35

Rotator Cuff Repair: Rehab Protocol

- Early vs Late Motion Protocols
- With small/medium tears, better motion at early time points, but equalize over a year
  - Similar re-tear rates (roughly 8%)
- Large tears have higher re-tear rates and may be best treated with late motion protocols
- Sling use out to 10 weeks
- Strengthening at 10 weeks
- Minimum 4-6 months until released to full duty
- MMI usually 6-8 months

36

Rotator Cuff Repair: Outcomes

2008 Oct;90(10):2105-13.
doi: 10.2106/JBJS.F.00260.
Patients with workers' compensation claims have worse outcomes after rotator cuff repair
R Frank Henn 3rd[1], Robert Z Tashjian, Lana Kang, Andrew Green

Conclusions: Patients with Workers' Compensation claims report worse outcomes, even after controlling for confounding factors. The present study provides further evidence that the existence of a Workers' Compensation claim portends a less robust outcome following rotator cuff repair.

37

Rotator Cuff Repair: Outcomes

2021 Jul;49(8):2238-2247.
doi: 10.1177/0363546520975426. Epub 2021 Jan 4.
Return to Work After Primary Rotator Cuff Repair: A Systematic Review and Meta-analysis
Eric D Haunschild[1], Ron Gilat[1], Ophelie Lavoie-Gagne[1], Michael C Fu[1], Tracy Tauro[1], Brian Forsythe[1], Brian J Cole[1]

"Conclusion: The majority of injured workers undergoing rotator cuff repair return to previous work at approximately 8 months after surgery. Despite this, **>35% of patients are unable to return to their previous work level after their repair procedure."**

38

Rotator Cuff Repair: Outcomes

- Continued pain, stiffness and weakness
- Consider repeat MRI
- If rotator cuff intact, consider steroid injection
- If unable to return to previous level of work, consider Functional Capacity Evaluation
- May need to assign Permanent Restrictions
- Permanent Partial Disability often 10-20%

- Recurrent, irreparable rotator cuff tear may require Reverse Total Shoulder Arthroplasty

39

Questions or Discussion?

THANK YOU!

40