

# The “Occupational Shoulder”

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# Epidemiology

- MSM/TOS Practice based data 2001-2012
- Over 10000 new shoulder referrals
- 2667 non-WC shoulder surgeries (78%)
- 745 WC shoulder surgeries (22%)

# Epidemiology- WC n=745 cases

- RC repair- 36%
- Acromioplasty/Mumford- 36%
- Labral/biceps/instability- 22%
- Other- 6%

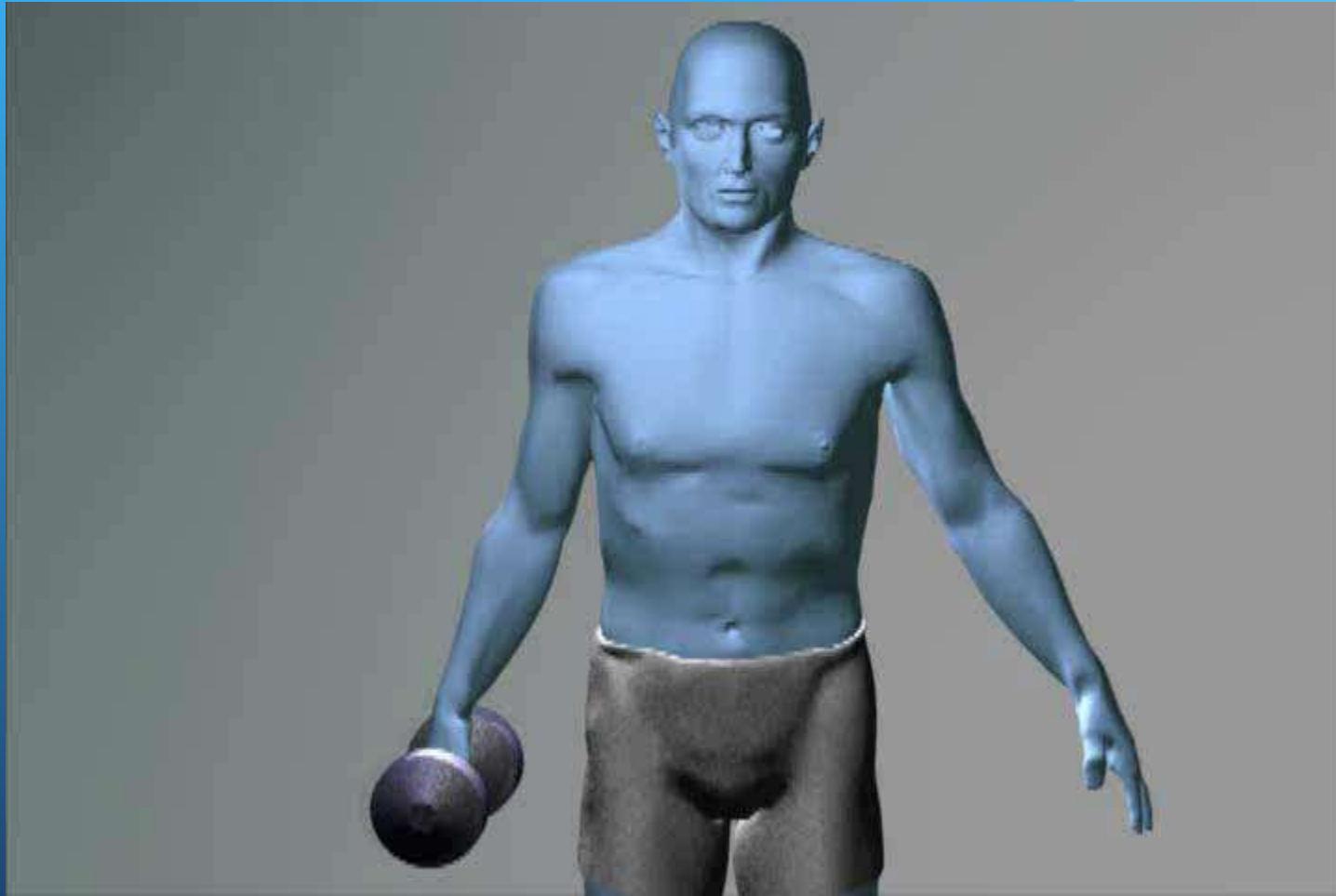
# Epidemiology

|             | Non-WC    | WC         |
|-------------|-----------|------------|
| % acute     | 52        | 83         |
| Pain rating | 5.4       | 5.3        |
| Narcotics   | 38%       | 27%        |
| Mean age    | 47 (8-94) | 45 (17-79) |
| Male/female | 57/43     | 62/38      |

# Anatomy



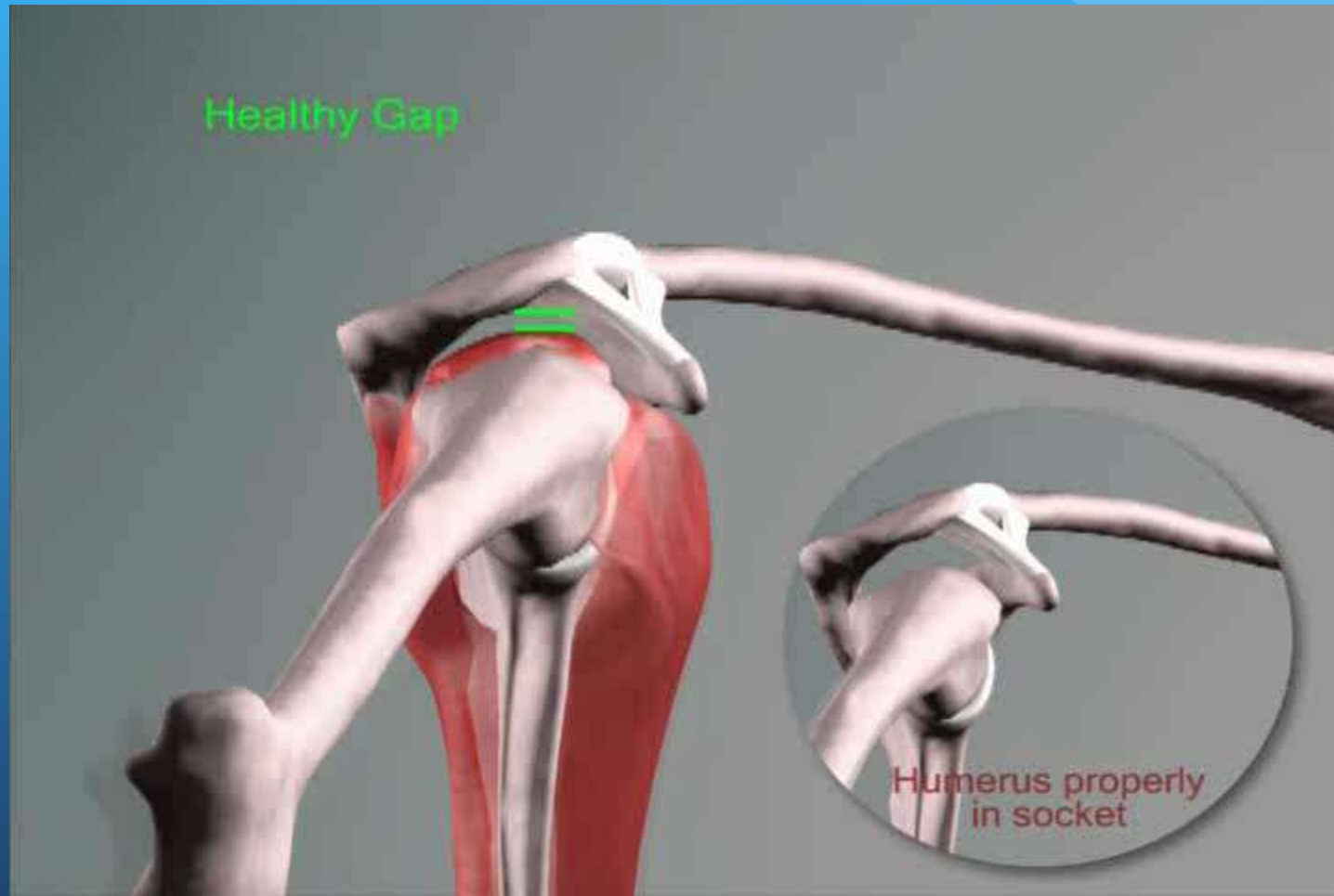
# Normal mechanics



# Classification-Rotator cuff injury

- Acute- traumatic
  - Fall
  - MVA
  - Abrupt load- work or sports
- Acute on chronic
  - Trauma
  - Sudden change in job demands
- Chronic- atraumatic
  - Degenerative
  - Overuse

# Pathophysiology

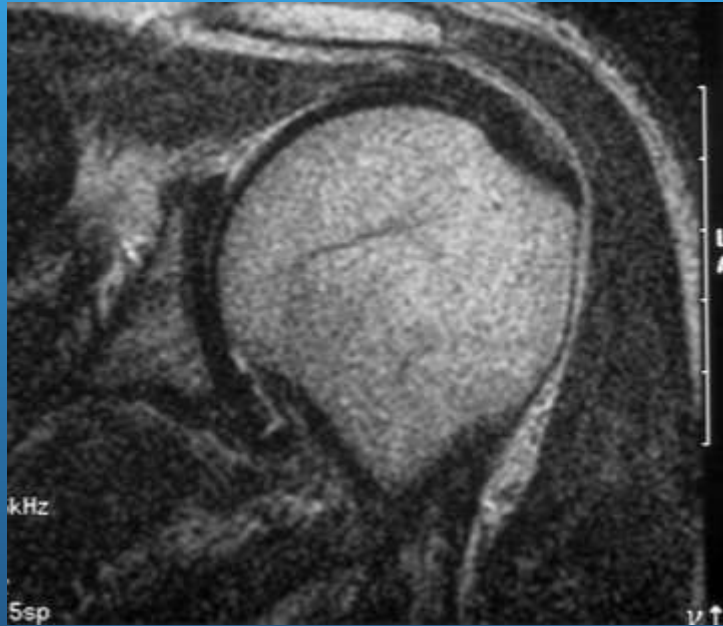




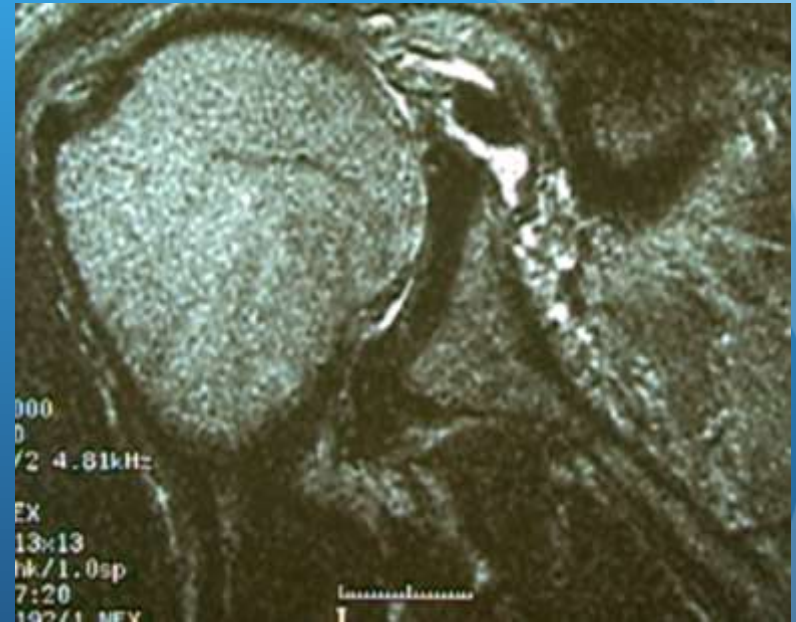
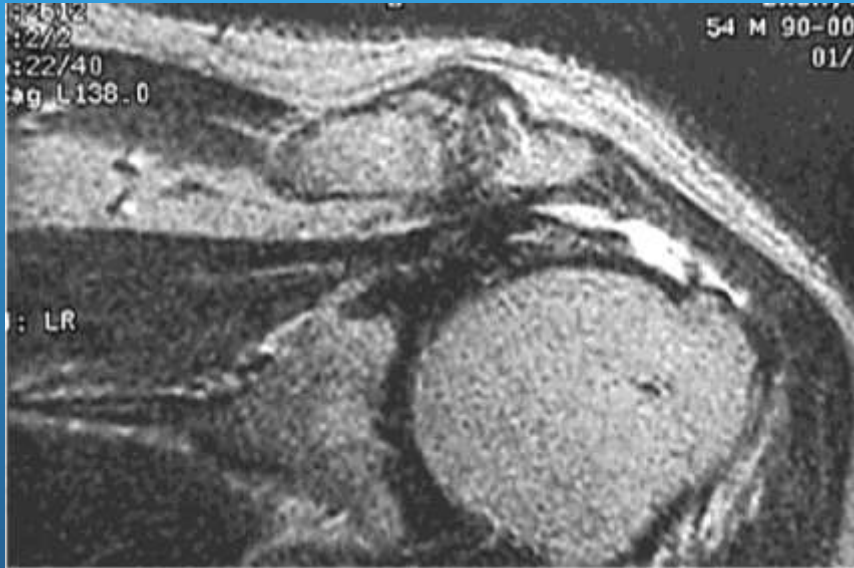
# Presentation- Rotator Cuff disease

|                  | Impingement | RC tear                   |
|------------------|-------------|---------------------------|
| Injury           | yes         | yes                       |
| Atraumatic       | yes         | yes-60%                   |
| Age range        | 25-40       | 40-65                     |
| Pain character   | Localized   | Diffuse ache in upper arm |
| Night pain       | rare        | common                    |
| Strength         | normal      | Sometimes weak            |
| ROM              | normal      | Sometimes limited AROM    |
| Impingement sign | +/-         | +/-                       |

# Radiology-MRI



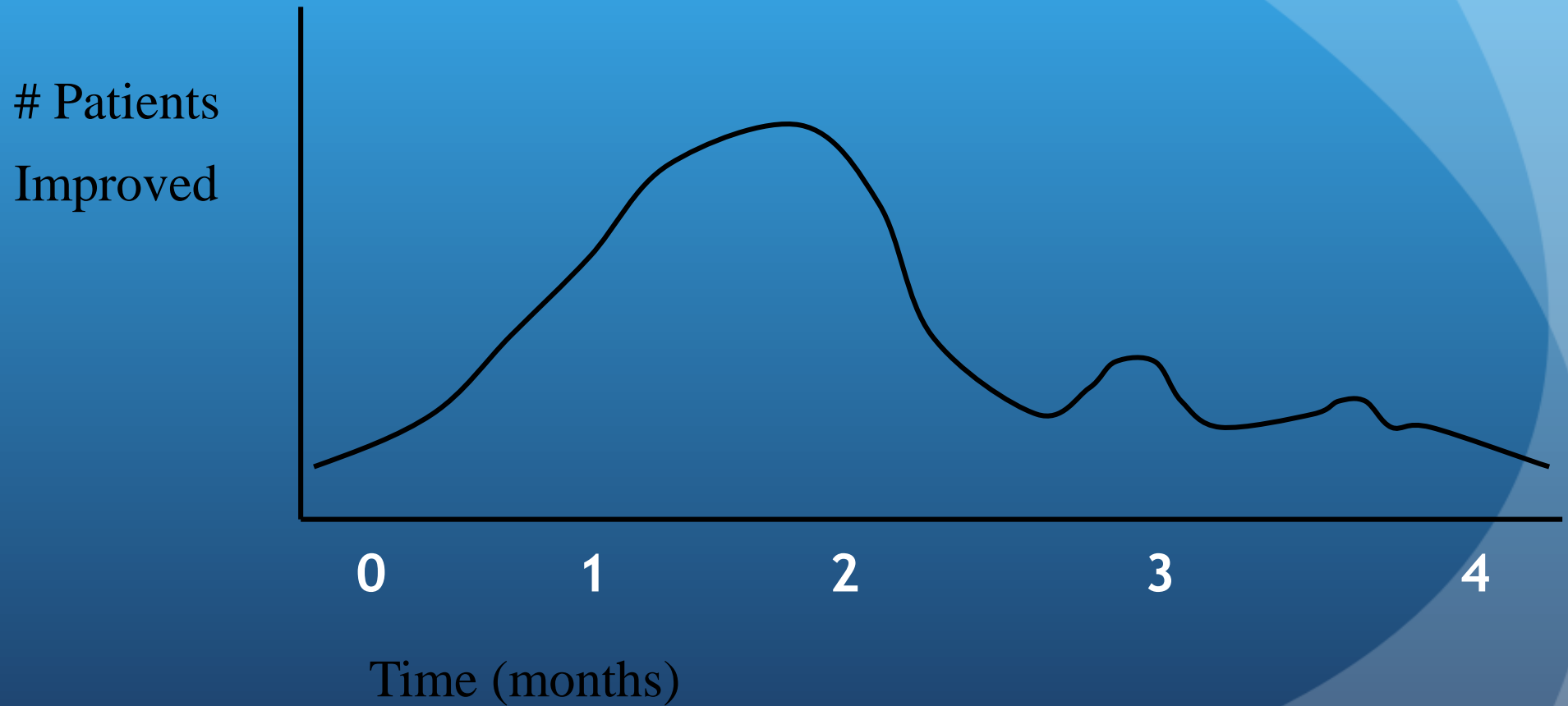
# Radiology-MRI



# Conservative Treatment

- Relative rest- light duty
- Medications- NSAIDs, narcotics, etc
- Injection- subacromial steroids
- Cryotherapy
- Physical therapy- ROM, cuff strengthening
- Progressive return to activities

# Conservative treatment

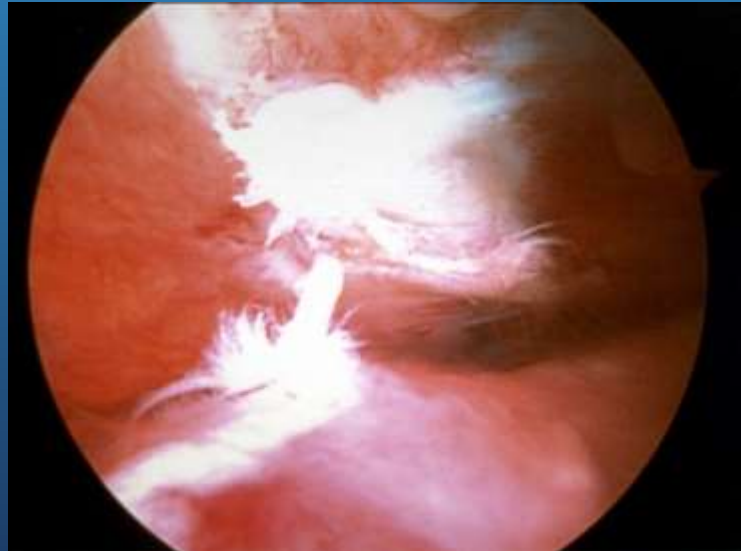
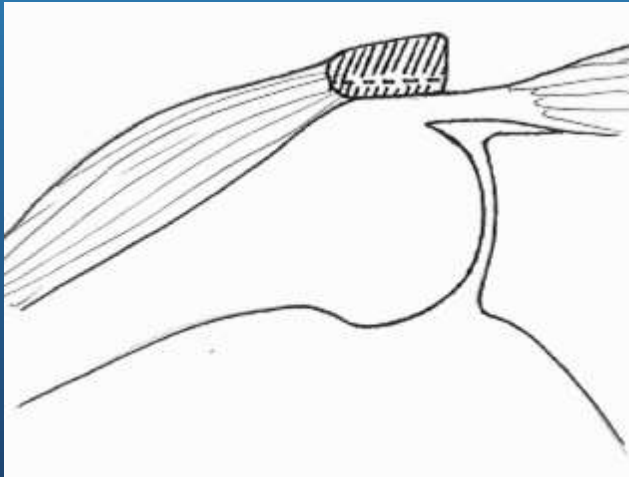


# Considerations for Surgery

- Failure of conservative tx
- Acute tears in younger high demand individuals
- Physiologic age
- Activity level- work and home
- Feasibility of repair
- Patient expectations

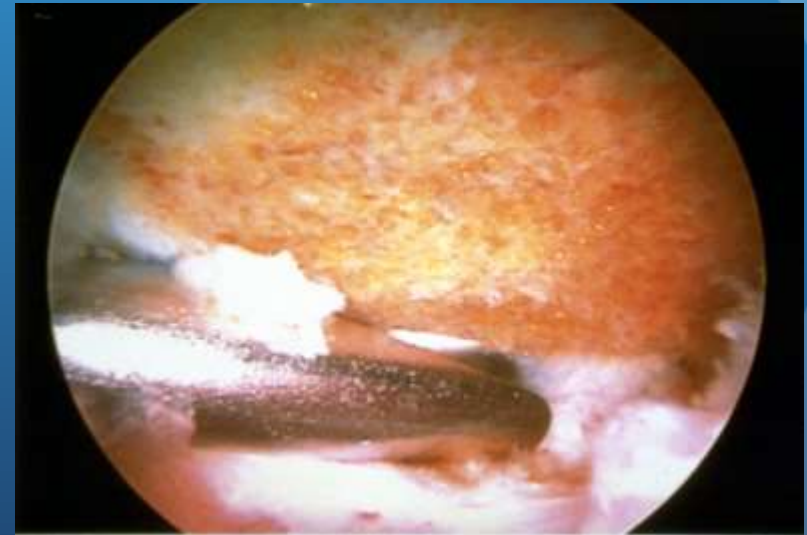
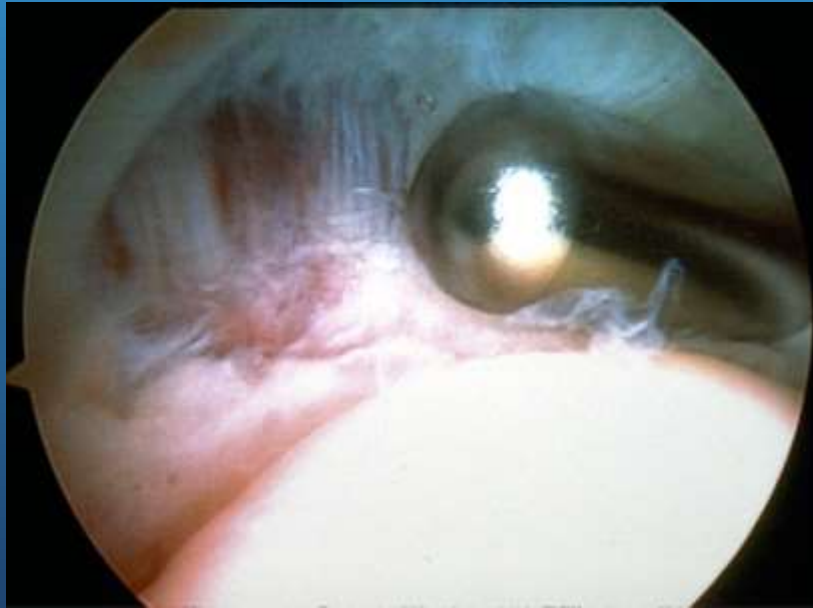
# Surgery - Impingement

- Acromioplasty
- Good / excellent results 85 - 95%
- Rehab 3 months



# Surgery- Rotator Cuff Partial Tear

- Debridement +/-acromioplasty for small articular partial tears
- Repair for articular tears > 50% thickness and bursal tears

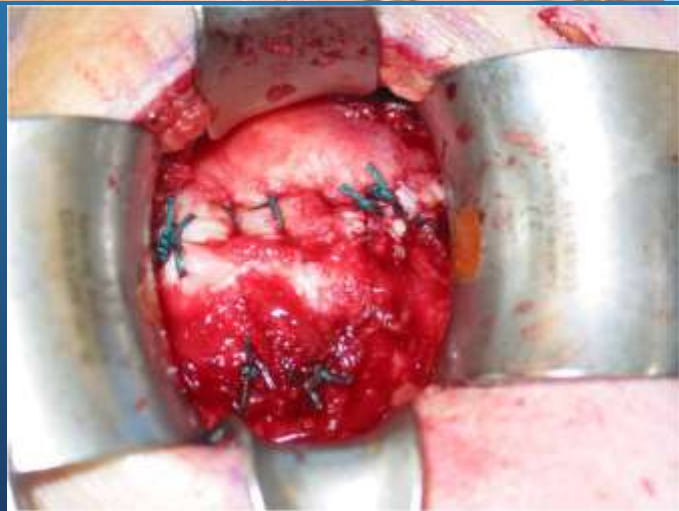
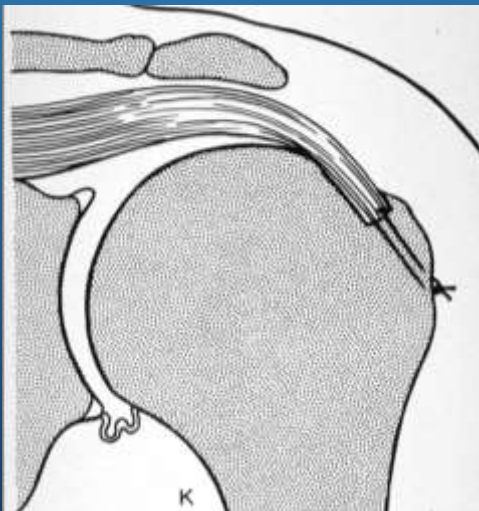
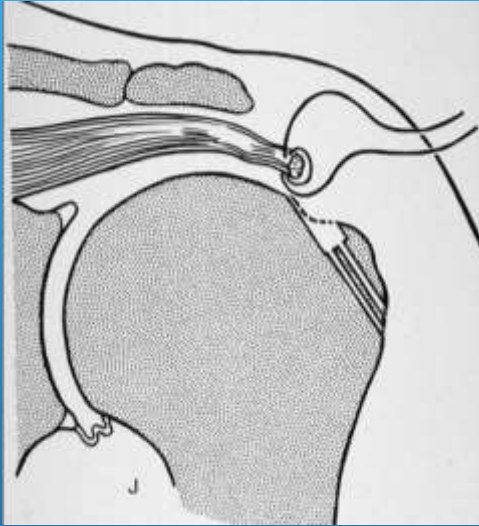




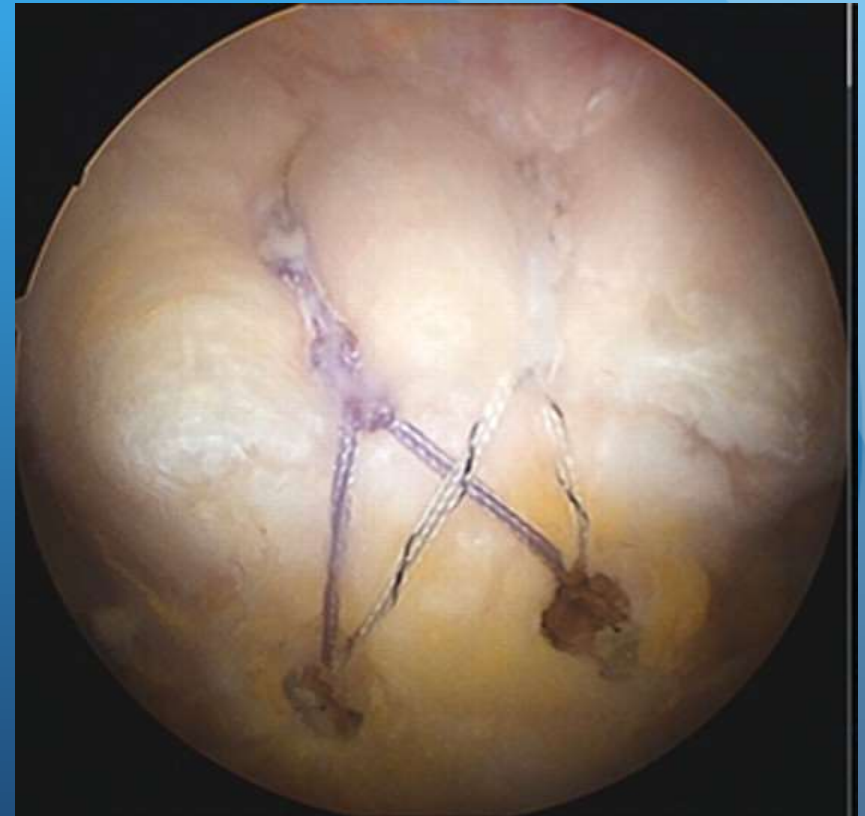
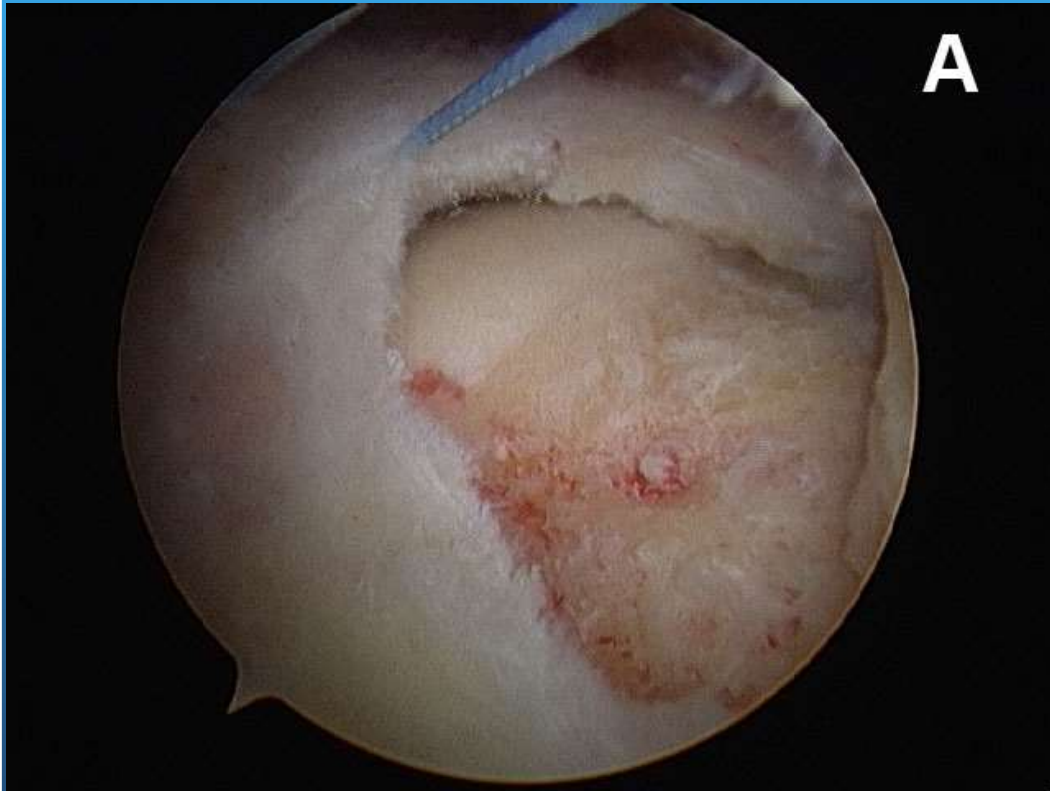
# Surgery-Rotator Cuff Tears

- Repair for symptomatic full thickness tears
- Rehab 3 to 6 months
- Return to work dictated by work demands
- Success rate 70-92%

# Surgery-Open Rotator Cuff Repair



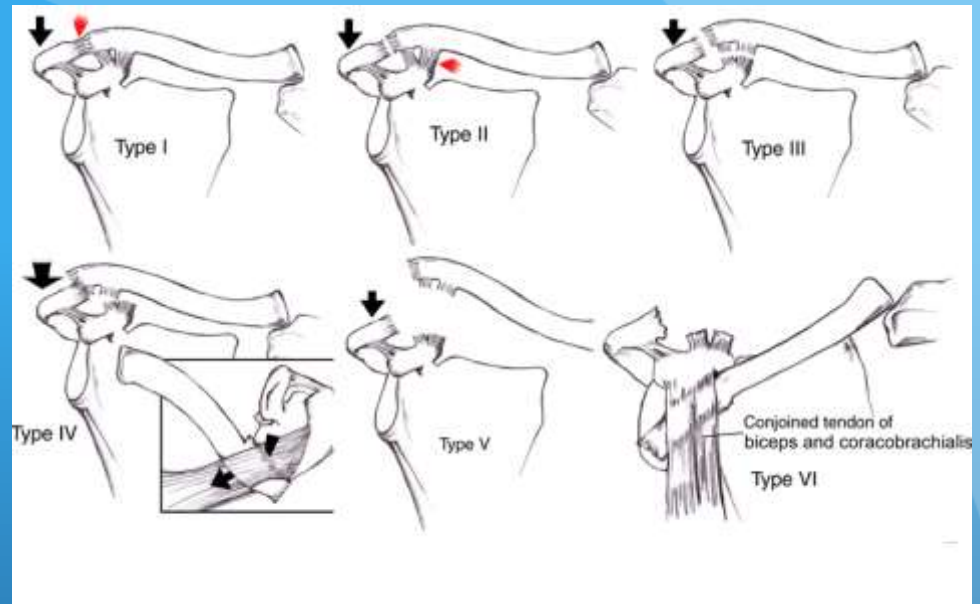
# Arthroscopic repair



# AC joint injuries

- AC separation
- AC arthralgia
  - Traumatic vs overuse
  - Pre-existing DJD

# AC separation



- Grade 1 and 2- non-operative care. 10-15% develop post traumatic AC arthralgia
- Grade 3- non-operative for most cases, occasional surgery for heavy overhead demands
- Grade 4, 5 and 6 require surgical reduction and fixation

# AC arthralgia

- Asymptomatic AC DJD is common > age 40
- Pre-existing asymptomatic AC DJD can become symptomatic after work place trauma
- 20% of patients with AC symptoms have negative X-rays
- AC symptoms coexist with Rotator cuff issues ~20% of cases
- Patients present with pain in the superior shoulder, neck, scapula and often have neural symptoms

# AC arthralgia

- Initial treatment involves rest, NSAIDs, ice, and in some cases PT. Many patients respond poorly to resistance training
- Injection is occasionally helpful in acute cases and to aid in diagnosis. It is rarely helpful if symptoms have been established for > 3 months or if MRI shows bone edema
- Distal clavicle excision (Mumford procedure) is indicated in patients with > 3 months of non-responsive symptoms
- Results are favorable in >95% of cases

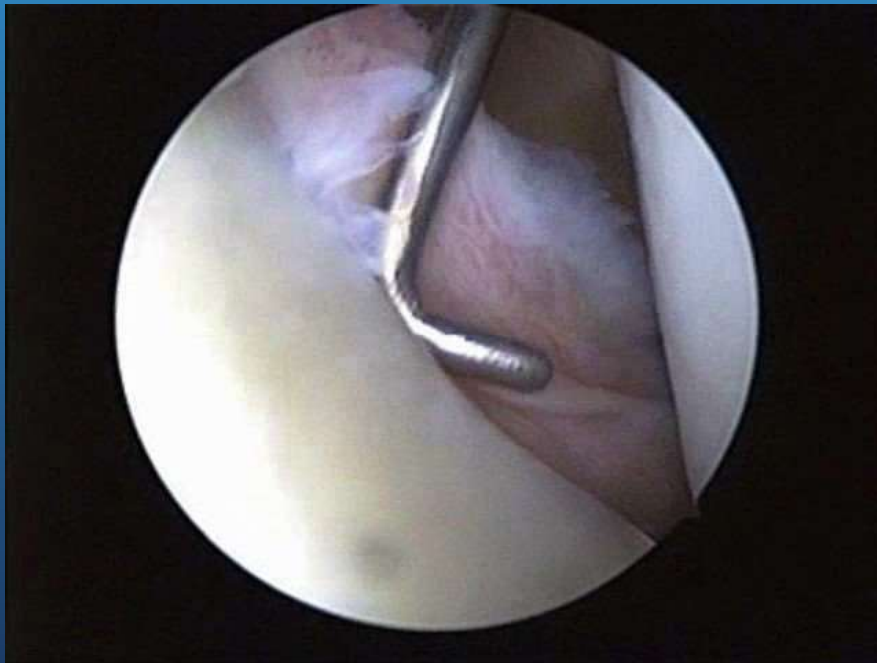
# Labral tears

- The labrum has a significant amount of anatomical variability
- Asymptomatic degenerative changes in the labrum are common after age 40
- Labral tears are difficult to diagnose by exam or MRI.
- Degenerative labral “tears” are commonly found in patients with rotator cuff pathology
- Superior labral tears (SLAP lesions) are typically chronic and degenerative in most WC patients. Acute tears can occur and are usually associated with trauma.
- Anterior inferior and posterior inferior tears are commonly traumatic and associated with subluxation/ dislocation of the joint.



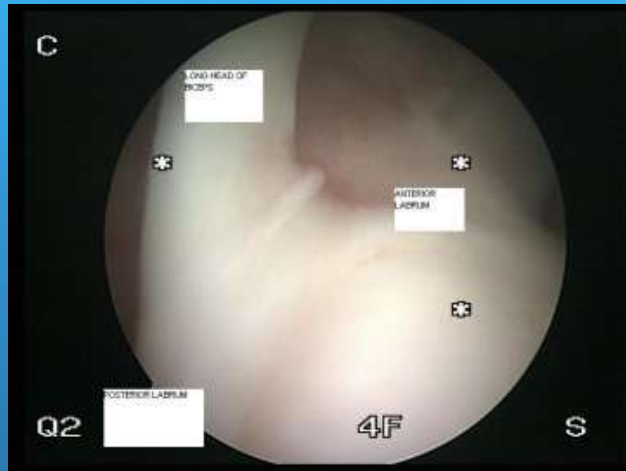
# Anterior labral tear-Bankart lesion

Patients with instability and anterior tears may often require surgery depending on age and work demands. Results of early surgery in young active patients are successful in >90% of cases

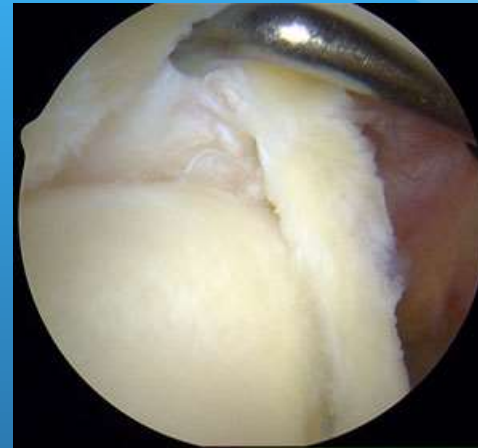


# Classification- SLAP (Superior Labrum Anterior Posterior)

## Normal



## Type 2



## Type 3



## Type 4

# Labral tears- SLAP

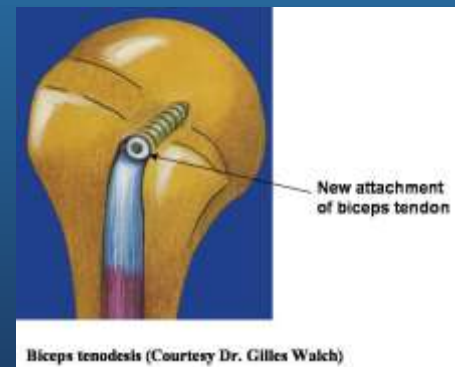
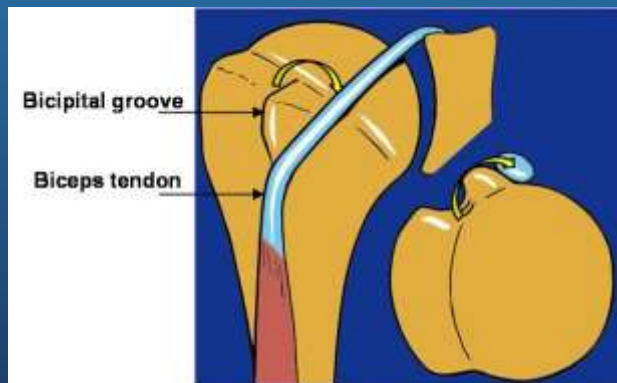
- Initial treatment- rest, sling, NSAIDs, PT
- Degenerative labral tears are over diagnosed and over treated
- Patients with SLAP lesions require surgery if they are causing mechanical symptoms or chronic pain despite PT >3 months.

# Labral tears- SLAP

- Type 2 tears can be repaired in younger patients. The results of repair are less favorable with 75-80% success. There is increased risk of stiffness especially in patients >40 yo
- Type 3 and 4 tears are treated with debridement and/or biceps tenotomy vs tenodesis.

# Biceps subluxation/ biceps tears

- Biceps lesions are commonly found in association with impingement and rotator cuff tears
- Can be degenerative, acute or most commonly acute on chronic
- Biceps tendon partial tears or subluxations are treated with biceps tenotomy vs tenodesis. Outcome is virtually identical.



# Adhesive capsulitis (Frozen shoulder)

- Etiology is not fully understood
- Affects W>M by 3-4:1, associated with diabetes and thyroid
- Can be triggered by minor trauma. Rarely associated with immobilization. Most cases are atraumatic.
- Pre-freezing, freezing, frozen, thawing. Average time 12 months. > 90 % recover. Oral and injectable steroids. PT only in the frozen and thawing phases.
- ~5% require capsular release. ? If early surgery leads to better result.

# Factors that effect outcome

- Most studies suggest worse outcomes in WC patients vs non- WC
- WC patients score lower on almost all outcome measures pre-op compared to non-WC
- WC patients are more likely to experience acute trauma. The magnitude of the trauma is greater.
- WC patients are less educated, have higher rate of divorce, have a higher rate of tobacco abuse, and have higher work hours and physical demands than their counterparts

Measurement of baseline shoulder function in subjects receiving workers' compensation versus noncompensated subjects. [J Shoulder Elbow Surg.](#) 2005 May-Jun;14(3):286-97.  
[Sallay PI](#)<sup>1</sup>, [Hunker PJ](#), [Brown L](#).

- WC patients are less educated, have higher rate of divorce, have a higher rate of tobacco abuse, and have higher work hours and physical demands than their counterparts
- ASES score and job satisfaction were equal in WC and non WC patients. Marital status, sports participation and age.



# Factors that effect outcome

- Tobacco use impairs healing. The combination of WC + tobacco use has the worst outcome for RC repair
- Compliance has been shown to have a direct effect on results. Patients who are less compliant and have worse results
- Expectations are lower in WC vs non-WC patients
- Increasing number of older people in the workforce

# Factors that effect outcome

- WC patients who are physiologically youthful, positively motivated, do not smoke, and compliant have results that approximate non-WC patients

# Summary of Factors

- Care giver/ patient/ employer relationship
- Work environment-
  - Work demands
  - Ergonomics
  - Job control/ supervisor support
- Severity of injury
- Socioeconomic status
- Educational level
- Compliance
- Comorbidities
- Prior surgery

# Conclusion

- Poor outcomes in WC are multifactorial
- Some factors can be optimized others are out of our control
- Outcomes may be improved by further analyzing the factors in our control and developing risk assessment models which could optimize patient selection