## Shoulder Pain: Keep surgeon's hands in Pockets



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Case

68 year old

Rt shoulder pain

pain in all positions and motions

Radiation to arm

Night pain









 Do Symptoms progress and tears enlarge with time?

Is painful cuff tear related to age?

Does ADL related to tear size?

After RC repair - will it heal?

#### 2012



#### American Academy of Orthopaedic Surgeons Clinical Practice Guideline on

Optimizing the Management of Rotator Cuff Problems

"the recommendations were developed using systematic evidence-based processes"

#### Full Thickness Tears and Asymptomatic Patients

In the absence of reliable evidence, it is the opinion of the work group that <u>surgery not be performed</u> for asymptomatic, full thickness rotator cuff tears.

Strength of Recommendation: Consensus

#### Full Thickness Tears and Symptomatic Patients?

Rotator cuff repair is an option for patients with chronic, symptomatic full thickness tears.

Strength of Recommendation: Weak

Rotator Cuff Tears and Exercise, Corticosteroid Injections, NSAIDS, Activity Modification, Ice, Heat, Iontophoresis, Massage, T.E.N.S., PEMF, and Phonophoresis, TENS, US

We cannot recommend for or against Strength of Recommendation: Inconclusive



# Acute Traumatic Rotator Cuff Tears and Surgery Weak

#### Confounding factors

Increasing Age: Weak

MRI Tear Characteristics: Weak

Worker's Compensation Status:

Moderate



## The glenohumeral joint - a balance between mobility and stability

Anatomy

Biomechanics

Pathology

Common sense



אבחנה מבדלת



בדיקה גופנית

הדמיה

טיפול ראשוני

ניתוח (?)



## Shoulder pain

16% of all musculoskeletal complaints

Peak in age 45-64 years

1y prevalence 20-50%

Chronic: >6 months

Causes:

extrinsic

Intrinsic



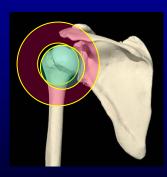
## SHOULDER PAIN

Extrinsic

Intrinsic

Intracapsular

Extracapsular



#### extrinsic causes

- · Cervical radiculopathy
- Suprascapular, long-thoracic, or spinal accessory neuropathy
- Adjacent or metastatic neoplastic disease
- Thoracic, abdominal

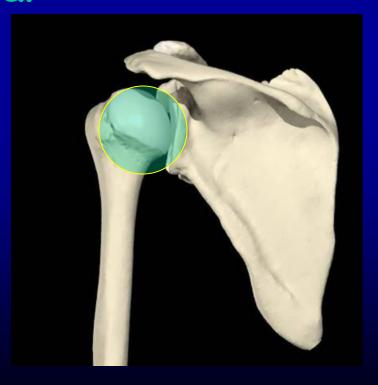


### Intrinsic shoulder disorders

#### Intraarticular

osteoarthritis adhesive capsulitis Instability Labrum / LHB

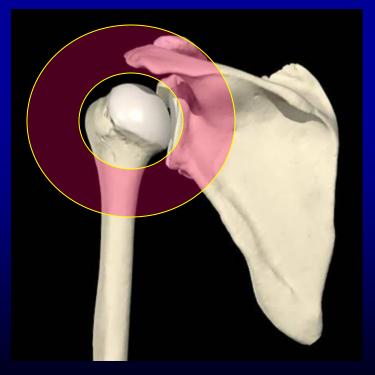
#### extra-articular



### Intrinsic shoulder disorders



extra-articular



impingement rotator cuff ACJ LHB

#### MAIN COMPLAINT - ?



PAIN

INSTABILITY

**STIFFNES** 

**WEAKNES** 

LOCKING

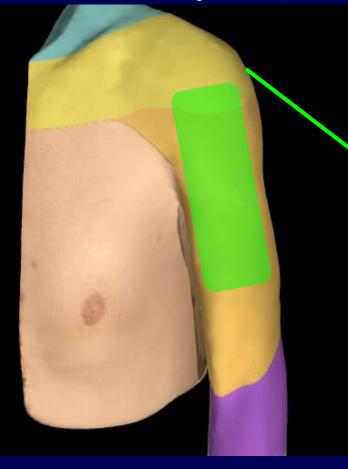
**DEFORMATION** 

## Where is the pain? Top of shoulder -

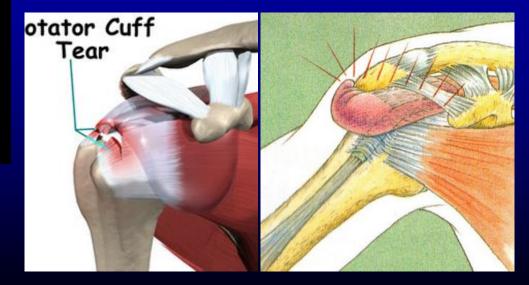




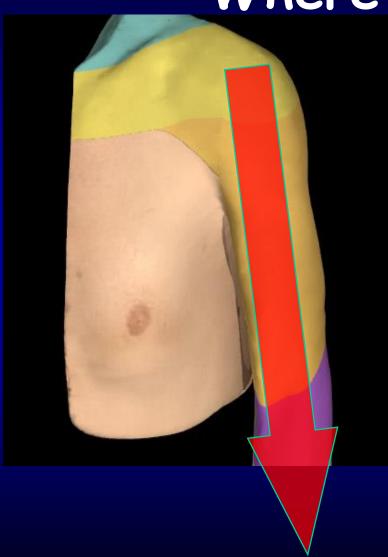
## Where is the pain?



Impingement (subacromial)



## Where is the pain?



## Radicular







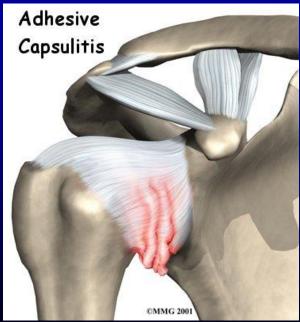
## Tendon rupture













## Rotator Cuff Impingement



### Evaluation

Selective injections (Lidocaine test)

SAS, ACJ



#### Case 1

68 year old male

Chronic Rt shoulder pain

pain in all positions and

motions

Radiation to arm

Night pain



#### What is known?

68 year old male
chronic shoulder pain
pain in all positions and motions
Radiation to arm

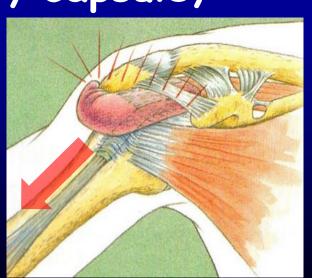
Night pain

Age 68 - primary cuff, adhesive capsulitis, osteoarthritis

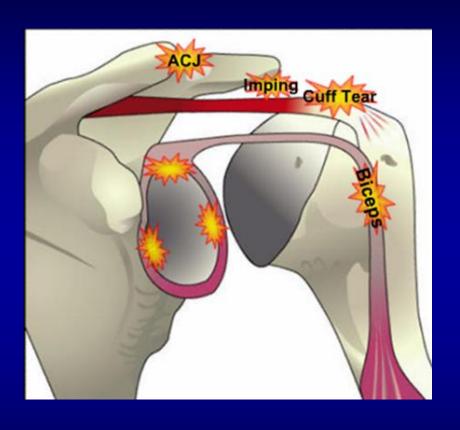
"Pain in all positions" - Cuff, capsule,

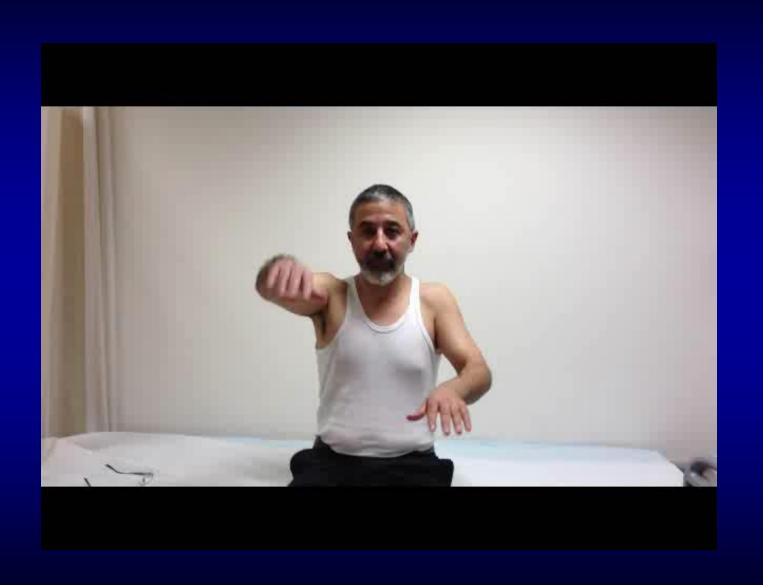
cartilage (OA)

Radiation to arm - RC

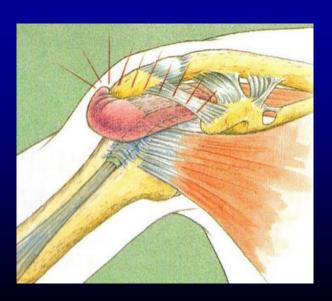


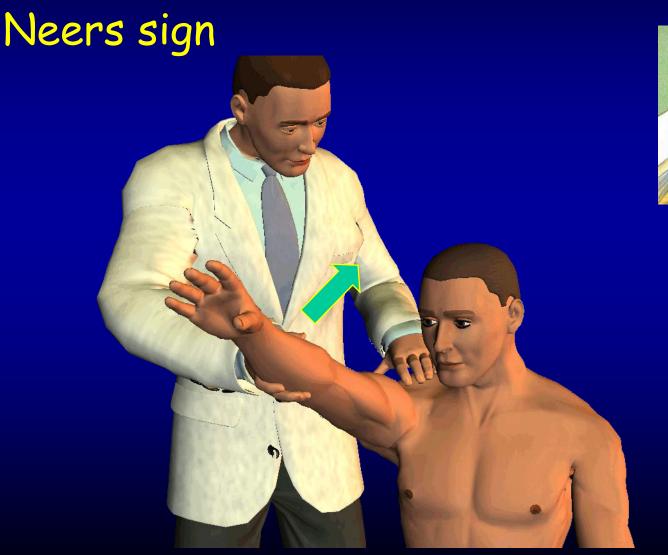
ROM Quality of motion Impingement tests RC tests LHB ACJ





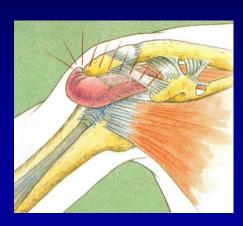
Neers sign Hawkins sign Jobes sign





Hawkins test







## Special Tests - Rotator Cuff

External rotation lag sign (ERLS) Hornblowers sign Infraspinatus / teres minor Internal rotation lag sign (IRLS) Liftoff test Subscapularis Zaslavs internal impingement test

## Special Tests - Rotator Cuff

External rotation lag sign (ERLS)

Infraspinatus / teres minor



### Special Tests - Rotator Cuff Internal rotation lag sign (IRLS)

Subscapularis
Lift off test

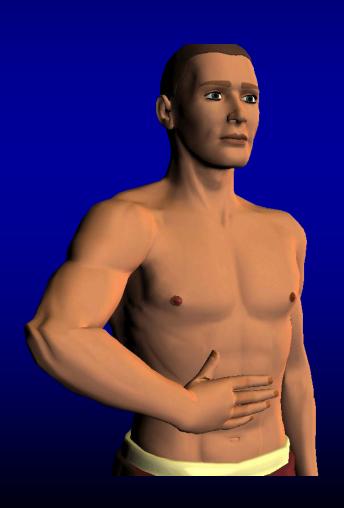
Bear hug test

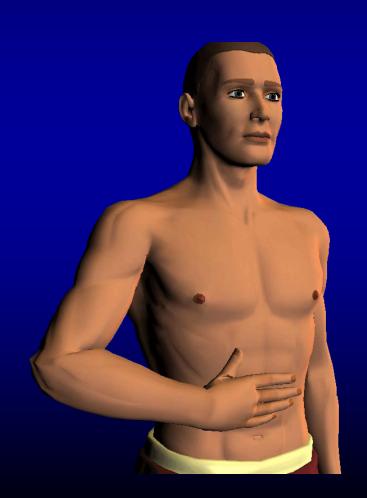






### Special Tests - Rotator Cuff Belly Press test





#### Special Tests - Biceps

Speeds test Yergasons test

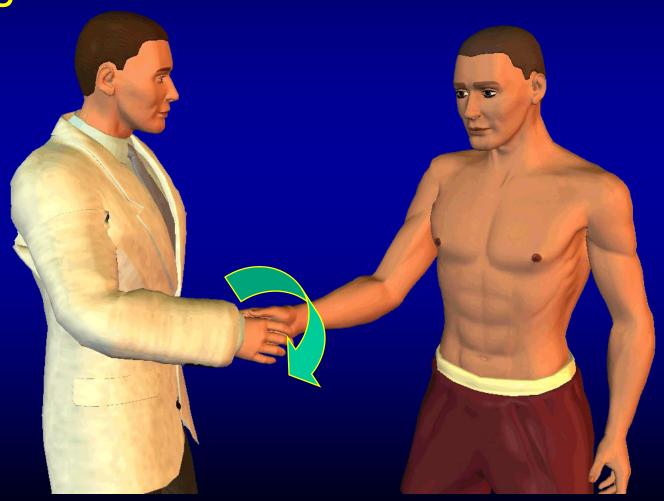
#### Special Tests - Biceps

Speeds test

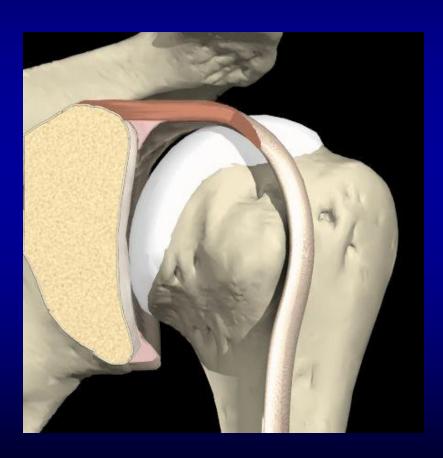


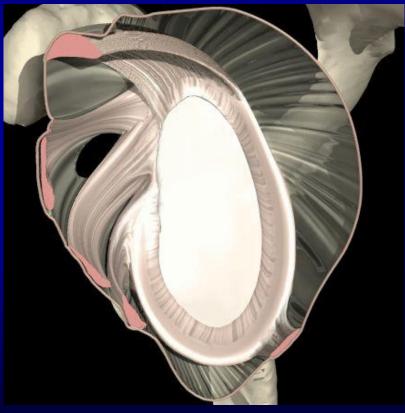
#### Special Tests - Biceps

Yergasons tests



# SLAP Tears Superior Labral Antero-Posterior





#### Mechanism

Distraction - Biceps Traction
Pull on arm

Peel-Back - Indirect
Hyperabduction
Indirect blow to arm

With Shoulder Dislocation

Extension of Labral

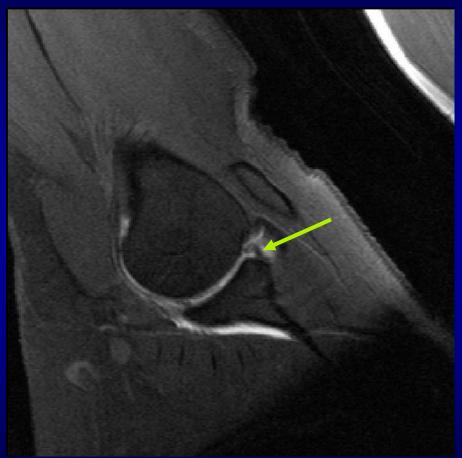
Tear





#### MR Arthrogram





76% Accuracy

#### O'Brien Test





No Pain Pain

#### O'Brien Test



#### Special Tests - SLAP Lesions

Crank test



## ACJ



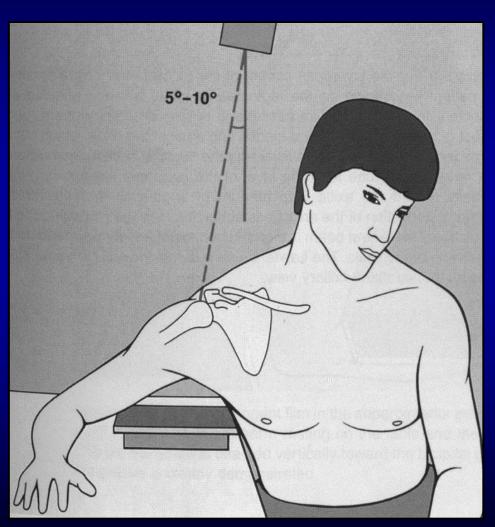
## Imaging

Bone

Soft tissue

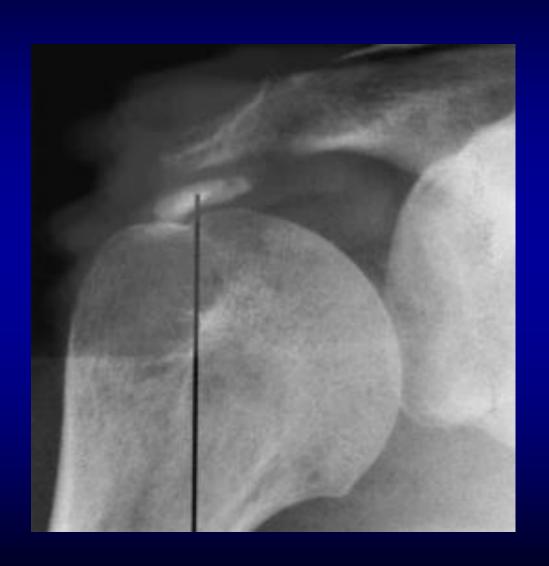
EMG

## Axillary view





#### Calcific Tendenitis

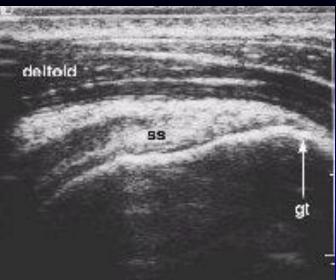


#### Massive RC tear



### Ultrasound













# Conservative treatment for RC tear

Pain

Function

Tear size

Duration of symptoms

# Conservative treatment for RC tear

Pain control - analgesics, NSAIDS, steroid inj.

Function - ROM, scapular stability, SSC, ISP

#### When to operate?

Recurrence of symptoms

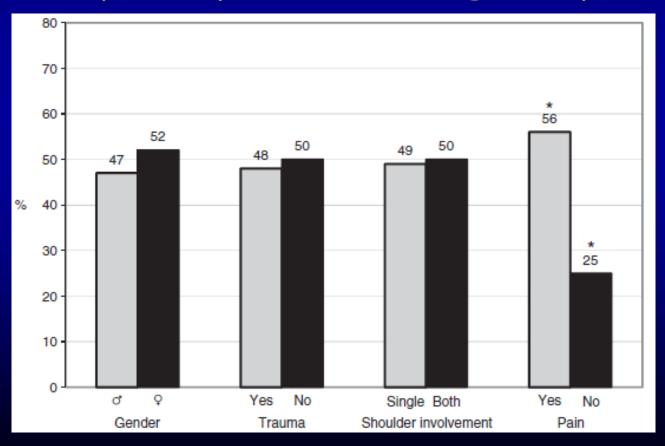
Failure with conservative Tx

Tear expansion

Less functional rotator cuff

#### Natural History of Nonoperatively Treated Symptomatic Rotator Cuff Tears in Patients 60 Years Old or Younger Safran O AJSM 2011

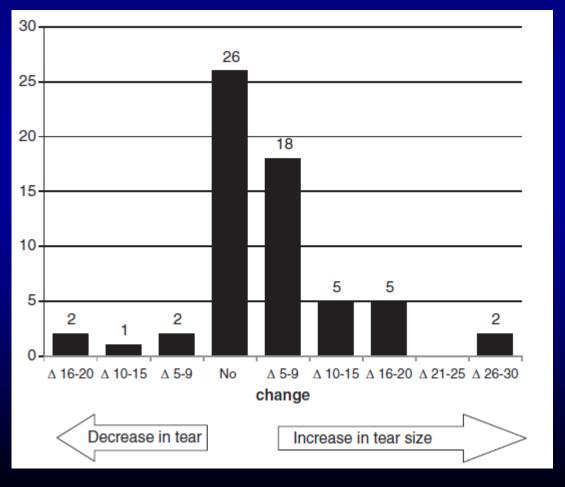
#### 51 patients <60y, 2-3y FU, mean age 54y



There was a correlation between the existence of considerable pain at the time of the follow-up ultrasound and an increase

in tear

49% had increased by 5 mm or more



The natural history of asymptomatic rotator cuff tears: a three-year follow-up of fifty cases moosmayer et at JBJS (am) 2013

18/50 developed symptoms

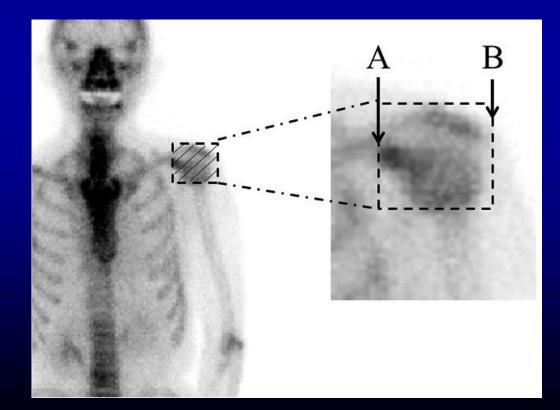
In the symptomatic group:

- Significant increase in mean tear size
- progressing to advanced muscle atrophy
- Pathology of the LHB in the newly symptomatic group

## Is it the bone?

Symptomatic Rotator Cuff Tears Show Higher Radioisotope Uptake on Bone Scintigraphy Compared With Asymptomatic Tears Koike AJSM 2013

36% in the symptomatic group showed increased radioisotopeuptake



# Bone density of the greater tuberosity is decreased in rotator cuff disease with and without full-thickness tears waldorff JSES 2011

Are the changes initiate within the tendon, the bone, or both?

Full-thickness RCT are associated with diminished BMD of the GT (loss of physical stimuli at the tendon insertion point)

Bone mineral changes are present in the greater tuberosity of shoulders with rotator cuff disease both with and without full-thickness tears

It is possible that these changes might precede the tear itself

Explanation for diminished

**BMD** 

Disuse osteopenia?

No - absence of corresponding der within the humeral head

 The osteopenic response at the GT after impingement most likely reflects a local increase in osteoclast resorption

# Treatment of rotator cuff tea Journal of Shoulder older individuals: a systemat Surgery

Downie, Miller 2012

review

Evidence based medicine

There is insufficient evidence to support efficacy of operative vs nonoperative treatment of RCTs in patients aged 60 years and older

The results suggest possible favorable outcomes with operative management of rotator cuff tears in this population



#### When Do Rotator Cuff Repairs Fail?

Serial Ultrasound Examination After Arthroscopic Repair of Large and Massive Rotator Cuff Tears Miller et al AJSM 2011

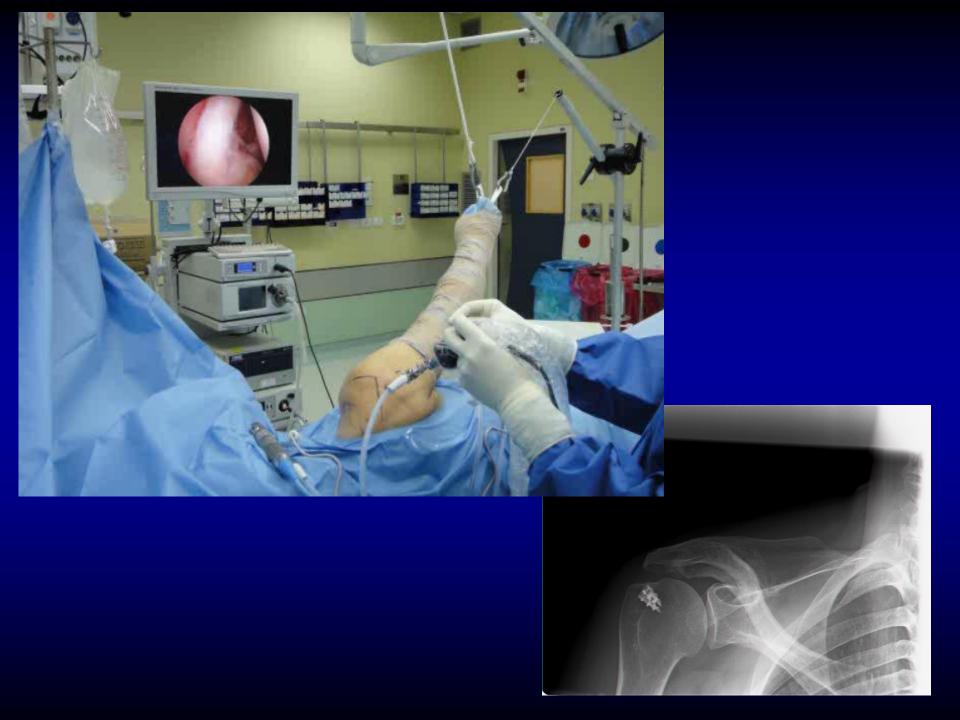
Objective: define the timing of structural failure of surgically repaired large and massive rotator cuff tears by serial imaging with US

- 22 patients, 9 (41%) retear
- 7 within 3 months of surgery
- 2 between 3 and 6 months
- No retears between 6-24 months



Winner of the 2010 O'Donoghue Award

- Suspect: the failure most often occurs at the suture-tendon interface, as there was often suture in the visualized tendon gap, and no evidence of displaced suture anchors
- Biologic factors that may govern the healing process
- Role of NSAIDS?











#### When not operate?

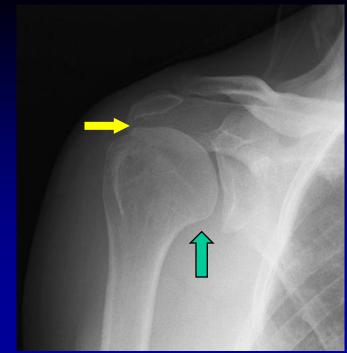
Tear / Patient characteristics:

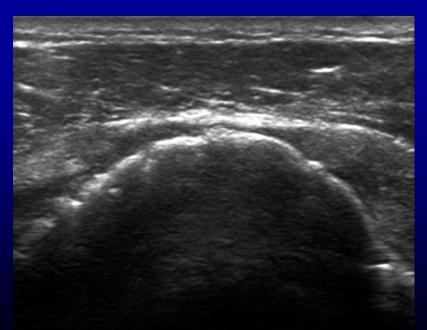
Small, asymptomatic tears

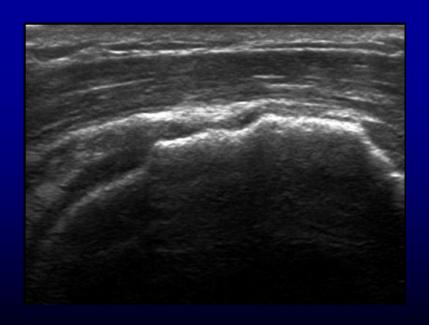
Good response to conservative Tx

Patient: elderly, work related









#### Anterior Deltoid Strengthening program



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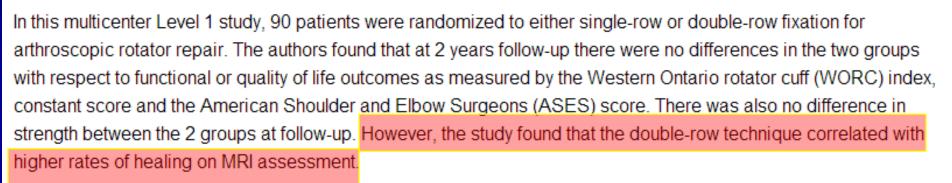
By The Journal Of Bone & Joint Surgery

Email The Journal Of Bone & Joint Surgery

A Multicenter Randomized Controlled Trial Comparing Single-Row with Doul Cuff Repair

J Bone Joint Surg Am. 2012 Jul 18;94(14):1249-57.

Lapner PL, Sabri E, Rakhra K, McRae S, Leiter J, Bell K, Macdonald P. Pan Am Clinic, Winnipeg, Canada.

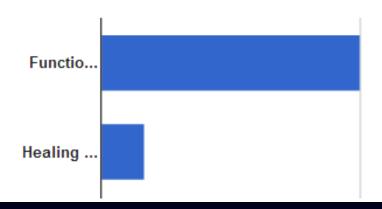


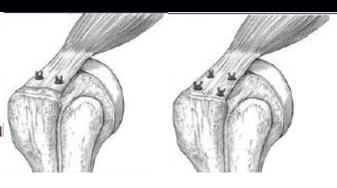
What is more important, functional outcomes or healing rates?

#### Select your vote

Functional outcome

Healing rate





Impact of work-related compensation claims on surgical outcome of patients with rotator cuff related pathologies: A matched case-control study

Journal of Shoulder and Elbow Surgery

Volume 19, Issue 3, April 2010, Pages 452-460

Purpose: examine the impact of an active compensation claim following a work-related shoulder injury on

reporting disability

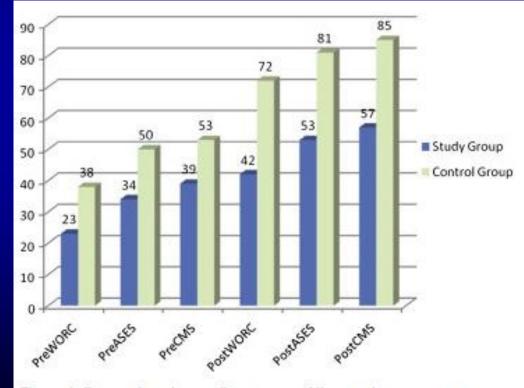


Figure 1. Pre- and post-operative scores of three outcome measures.

## Outcome of rotator cuff repair

Journal of Shoulder and Elbow Surgery

Volume 11, Issue 3, June 2002, Pages 201-211

#### 710 consecutive open RC repairs

 patient self-assessment of satisfaction is very high - 87.5% pleased overall

#### worse results after surgery:

- workers' compensation
- revision surgery
- < 55 y</li>





2008 68 y



2013 73 y

#### Case 2

26 year old male

Chronic Rt shoulder pain 6

months

More in overhead activities

Weakness



Is it intrinsic or extrinsic?

Is it focal or radicular?

Neck pain?

Pain - location, radiation, exacerbation

Is there muscle wasting?

Which muscles are involved?

Is there instability?

Are there other neurological symptoms?





#### What is known?

26 year old male
chronic shoulder pain 6 months
More in overhead activies
Weakness

Age 26 - Age eliminates primary cuff, adhesive capsulitis, osteoarthritis

Instability: Male-Laxity less common

"Weakness" - What are your symptoms,

pain or weakness?

#### D.D. At this point

Neurological etiology - Can be based on Hx

and PE

"Weakness, overhead"

Pathology could be Cervical radiculopathy, cervical rib or a prominent C7 transverse process, Parsonage-Turner syndrome, Rotator cuff Tear, Suprascapular nerve entrapment

## Imaging studies

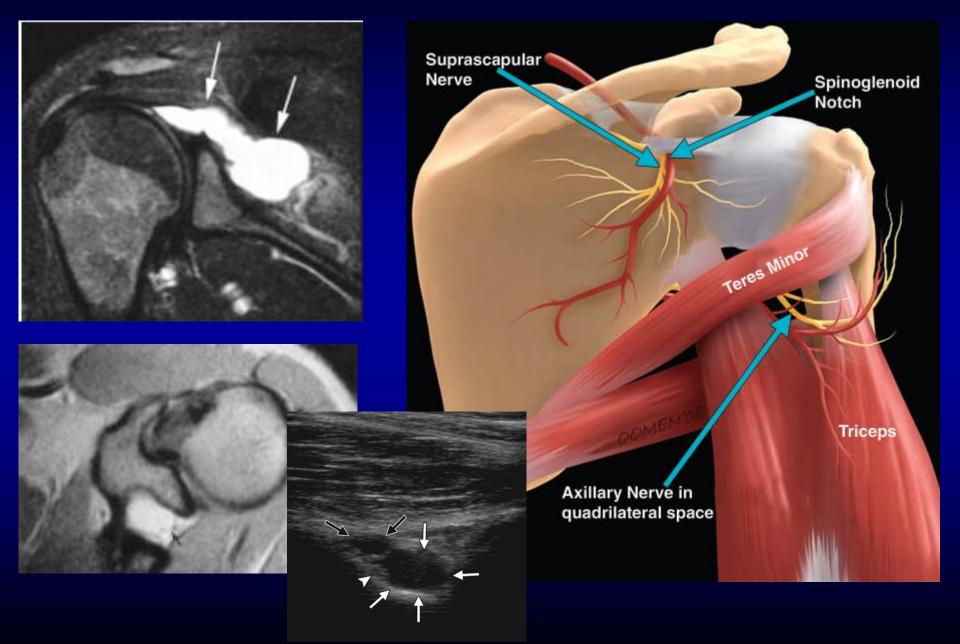
Shoulder + C spine radiographs

Ultrasound

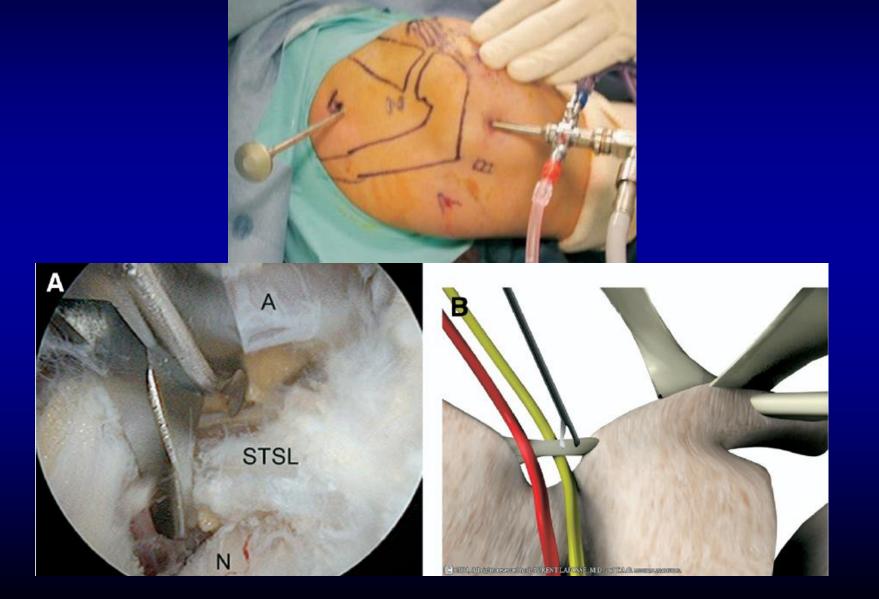
EMG

MRI - shoulder, spine (?)

## Imaging studies



## Suprascapular neuropathy



## Or....



46 y male Left shoulder pain 4-5 m Night pain No injury MRI - paralabral cyst

Case 3



#### What is known?

46 y male Left shoulder pain 4-5 m Night pain No injury MRI - paralabral cyst

Age 46 - primary cuff, adhesive capsulitis, osteoarthritis+/-

"Pain in all positions" - Cuff, capsule, cartilage (OA)

No injury - RC tear less likely

Limited ROM - Adhesive capsulitis, OA

#### Frozen shoulder?

Adhesive capsulitis: inflammatory condition of the glenohumeral joint synovium and capsule leading to a restricted range of motion

#### Primary (idiopathic)

Diabetes

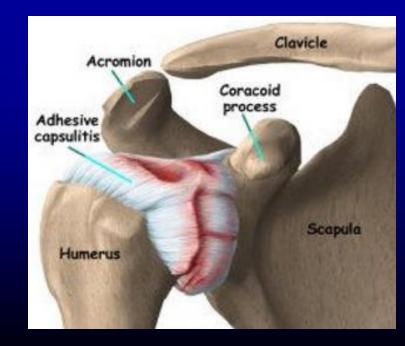
Hyper/hypothyroidism Intrathoracal pathology

#### Secondary

Surgery

Trauma

Prolonged immobilization



- 1st stage (freezing stage) early inflammatory stage, hypervascular synovitis
- 2<sup>nd</sup> stage (frozen stage) decrease in
- hypervascularity and synovitis, capsular contraction and thickening
- 3<sup>rd</sup> stage (thawing phase) no synovitis, decrease in the thickness of the capsule

The natural course is self-limiting Improves over an 18 to 24 m "supervised neglect"

poor prognostic indicators: Intrinsic pathology or insulin-dependent diabetes of more than 10 years

Freezing stage - insidious onset of pain. At the end of this period, shoulder

ROM becomes limited.

Frozen stage - reduction in pain, still restricted ROM

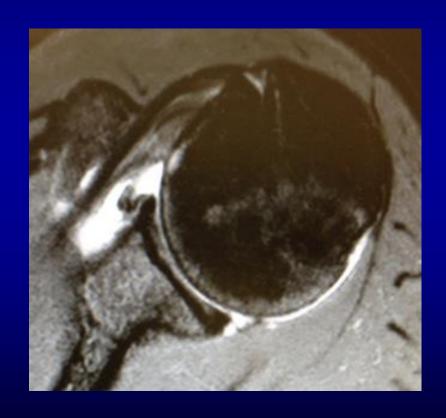
Thawing stage - ROM improves (can take

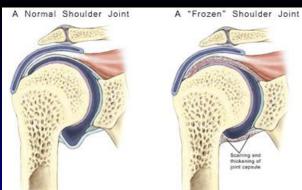
between 12 and 42 m)



# Case 3 MRI - "paralabral cyst"







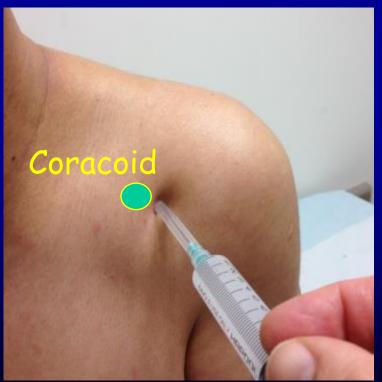
#### Adhesive C.



#### Normal









## Adhesive Capsulitis - Tx

According to stages!

Freezing stage - insidious onset of pain. At the end of

this period, shoulder ROM becomes limited.

Pain control, ROM, steroid injection

Frozen stage - reduction in pain, still restricted ROM

ROM, steroid injection, MUA, Surg. release

Thawing stage - ROM improves (12-24m)

ROM, MUA, Surg. release



### Summary

History
Expose
Palpate
Active ROM
Passive ROM
Special Tests



## Summary

#### Conditions

Instability

Subacromial impingement

Rotator cuff rupture

Frozen shoulder

OA



## תודה!

