Traumatic Shoulder Instability: Treatment Options for Physicians

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Shoulder Instability: Many Types
Must be clear always what we are referring to…

- **Atraumatic Instability**
  - ✓ **Subluxations**
  - ✓ **Ligamentously lax patient**
  - ✓ **Typically no structural lesion**
  - ✓ **Multidirectional**
  - ✓ **Surgery rare**
- **Traumatic instability**
  - ✓ **Locked dislocation**
  - ✓ **Requires reduction**
  - ✓ **Structural damage**
  - ✓ **Surgery common**
  - ✓ **Unidirectional**
    - **Anterior**
    - **Posterior**

Goals

- **Define traumatic anterior shoulder instability**
- **Review the pathology involved with instability**
- **Review the pathology of recurrent instability**
- **Review the long-term outcomes of instability**
- **Discuss treatment options based on patient demographics**

Most Common: Traumatic, Locked, Anterior Shoulder Dislocation

- **Common problem that is sports specific**
  - ✓ **Football**
  - ✓ **Basketball**
  - ✓ **Hockey**
  - ✓ **Wrestling**
- **Traumatic fall**

20% of shoulder injuries

The Concern for our Patients

Recurrent Instability

Recurrence vs. Age *Natural History*

Author	*Published*	*Age*	*Recurrence*
McLaughlin (1950)	1950	<20	90%
		<40	60%
		>40	10%
Rowe	1980	<20	94%
Simonet/Cofield	1984	<30	82%
Arciero	1994	<20	80%

More Recent Studies Confirm These Results

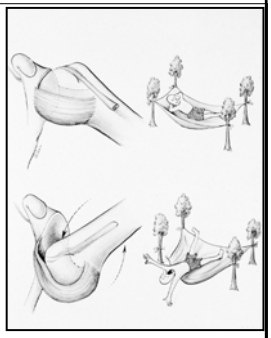
Recurrent Instability *Predictors*

- **Age**
  - ✓ **<20**
- **Gender**
  - ✓ **Male**
- **Activity level**
  - ✓ **Contact sports**

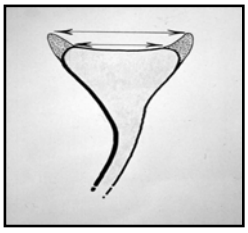
Robinson, et al. JBJS, 2006
Prognostic Level I Evidence

Pathology of an Anterior Dislocation

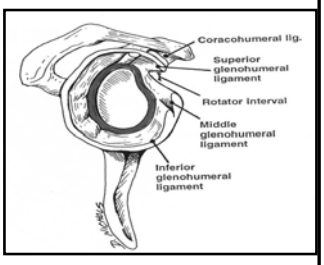
- **Bankart lesion**
  - ✓ **Ant/inf labrum Torn**
- **Hill-Sachs lesion**
  - ✓ **Impaction of Humeral head**
- **Capsular deformation**
  - ✓ **Capsule stretches 4-7%**



Labrum



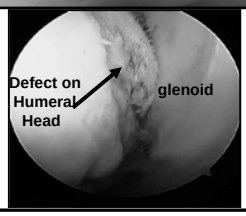
Increase contact surface area



Anchor for Capsule/Ligaments

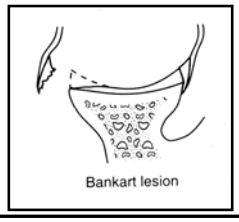
Humeral Pathology
Initial Dislocation

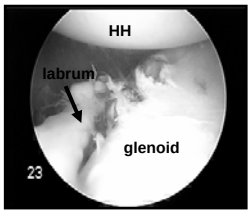
- **Hill-Sachs**
  - ✓ **90% Arciero 1997**
  - ✓ **100% Kirkley 1999**
  - ✓ **56% Larrain 2001**



Bankart: Capsulolabral Avulsion
Initial Dislocation

Author	*Published*	*Bankart*
Baker	1990	87%
Norlin	1993	100%
West Point	2001	97%





Recurrent Dislocations

- **The more dislocations, the worse the pathology**
  - ✓ **Increase ligament/labral damage**
  - ✓ **More capsular stretch**
  - ✓ **Increased Hill-Sachs lesions**
  - ✓ **Glenoid bone loss – erodes glenoid**
  - ✓ **Cartilage damage**

Larrain, et al. Arthroscopy, 2006
Cetik, et al. Acta Orthop Belg, 2007
Burkhart and De Beer, Arthroscopy, 2000
Boileau, et al. JBJS, 2006.

Ramifications?

Short Term

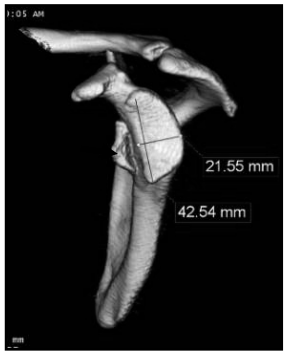
- Easier to dislocate
- Fail arthroscopy
- Require open surgery
- Bone grafting
- Uncertain outcomes

Long Term

- Higher risk for arthritis
- More severe arthritis
- Seen at earlier age

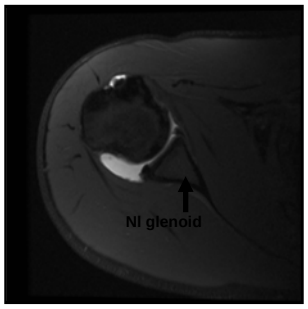
Glenoid Bone Loss

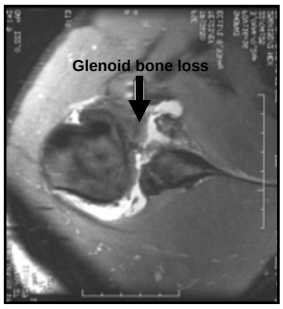
Anterior



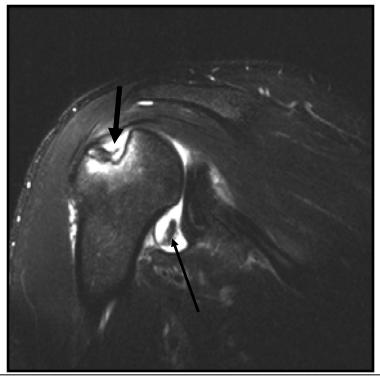
Posterior

Glenoid Bone Loss





Cartilage Damage



Treatment Options

- Patient Age > 40 @ 1st dislocation
  - ✓ Check x-rays: make sure no fractures
  - ✓ Sling for comfort (typically 1-2 weeks)
  - ✓ Check rotator cuff exam!
  - ✓ Start physical therapy soon
    - Higher risk for post-dislocation stiffness
  - ✓ Progress all activities to tolerance

What if They Fail Conservative Tx?

- c/o Recurrent anterior dislocation –
  - ✓ Halt contact sports
  - ✓ MRI/gadolineum
  - ✓ Refer for surgical evaluation
- c/o Subluxations –
  - ✓ Determine if it c/o is true instability
  - ✓ MRI
  - ✓ When do they occur – Sports versus ADL's
  - ✓ May be willing to give up sport – but need to shower!

Treatment Options

- Patient Age > 20 yo; <40 yo
  - ✓ Follow same principles just outlined
  - ✓ Unlikely to have any rotator cuff pathology
  - ✓ Sedentary lifestyle – unlikely to recur
  - ✓ Athletes:
    - return to sports when full motion/strength and no pain
  - ✓ Counsel patients accordingly:
    - Age – closer to 20?
    - Gender – male higher risk
    - Activity level – contact sports/martial arts/etc
    - MORE LIKELY TO HAVE A RECURRENT DISLOCATION

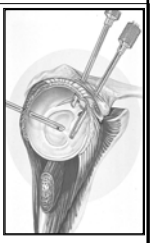
PE Findings with Anterior Instability

- Many of the exam techniques are difficult
- Often the patient is guarding during exam
- Apprehension test very reliable:

ABD/ER: FEAR

POSTERIOR PRESSURE: RELIEVES FEAR

Treatment Options



- Age < 20 yo @ 1st dislocation
  - ✓ High chance of recurrence
  - ✓ Still controversial
  - ✓ Rehab/finish season
    - • Surgery if sustain a recurrence
    - • Surgery at end of season
  - ✓ OR: Stop season – proceed with surgery
  - ✓ Surgery?
    - • Confirm pathology with an MRI

Evaluation and Treatment of Rotator Cuff Tears

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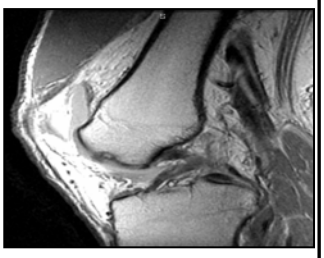
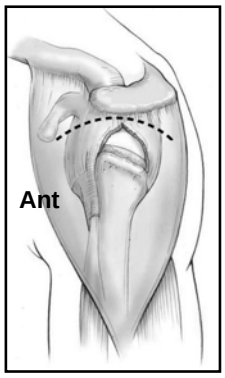
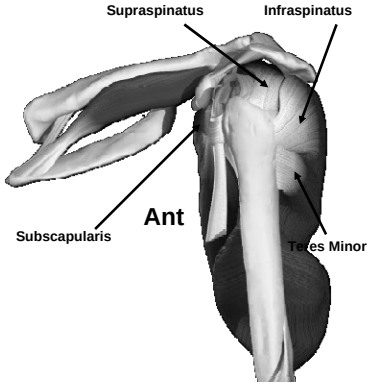
Should the Bankart Lesion be Viewed as the ACL of the Shoulder??



Rotator Cuff Tendons

- Supraspinatus
- Infraspinatus
- Teres minor
- Subscapularis



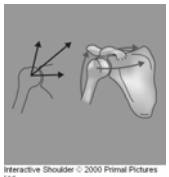


Lateral View

Etiology of Rotator Cuff Tears

Function of the Rotator Cuff

- Maintenance of humeral head position in the glenoid
  - ✓ Compresses humeral head into fossa, stabilizing against superior migration and providing stable fulcrum against which rotational forces can be applied.
- Rotational power of the shoulder
- Anterior and posterior aspects of the cuff work in concert
- Loss of one or the other creates translation movement and reduces the effect of compression



Intrinsic Factors

- Degenerative or tendinosis problem, rather than true tendinitis
- Vascular factors
  - ✓ Watershed or critical zone 1 cm medial to insertion of supraspinatus tendon
  - ✓ Differential vascularity between bursal and articular surfaces
- 5 layer structure predisposes to internal shear forces resulting in intra-substance tears

Extrinsic (Impingement) Factors

- Acromial morphology
- Anterior acromial enthesophytes
- Unstable os acromiale
- Degenerative acromioclavicular joint
- Internal impingement in overhead athletes

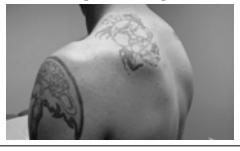
History

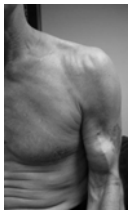
- Age- tears more common in older patients
- Trauma- dislocation in patients over 35, high incidence of rotator cuff tear
- Overhead activities cause pain
- Night Pain
- Pain over deltoid/ lateral shoulder
- Weakness/ loss of endurance
- Crepitation

Evaluation of Rotator Cuff Disorders

Physical Examination

- Inspection- atrophy, asymmetry, deformity (long head biceps rupture)
- Palpation- AC joint, bicipital groove, greater tuberosity, crepitation
- Active and passive range of motion
- Strength testing
- Neck exam- Spurling's maneuver

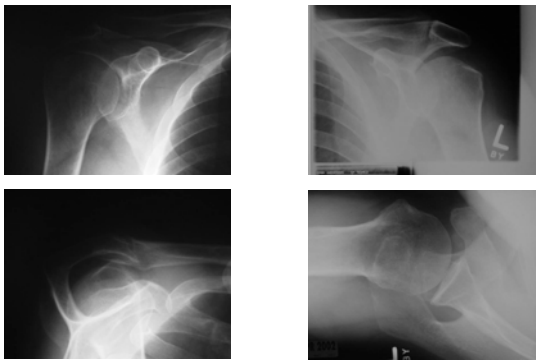




Impingement Examination

- **Hawkins' sign**
- **Neer impingement sign/test**

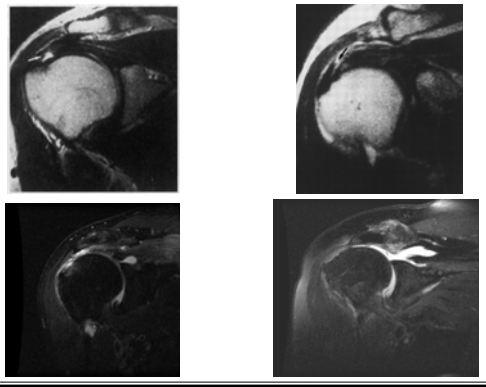
Plain Radiographs



Imaging

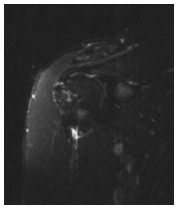
- **Plain radiographs- AP, low-voltage AP joint view, outlet view, axillary view, internal rotation AP**
- **Arthrogram**
- **Ultrasound**
- **MRI**
- **MR Arthrogram- assess for labral tears or integrity of rotator cuff repair**

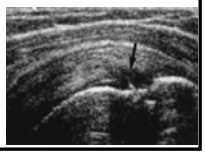
MRI



Rotator Cuff Tears in Asymptomatic Patients

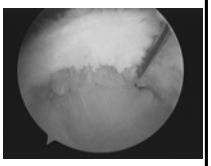
- Prevalence of rotator cuff tears is extremely high
- MRI of asymptomatic volunteers demonstrates partial or complete tears in 54% of people > 60 y.o. (Sher et al, 1995)
- Ultrasound of asymptomatic subjects detected a prevalence of rotator cuff tears in 40% of subjects > 50 y.o.
- Rotator cuff disease is found commonly in asymptomatic people





Non-Surgical Management

- PT to develop stabilizing rotator cuff force couple, strengthen scapular stabilizers, and stretch tight areas of the joint capsule
- NSAID's
- Corticosteroid injections ?
  - ✓ Wei et al, JBJS- rat study; single dose of steroid may not have long term effects on collagen gene expression, but collagen composition may be acutely by an injection



Treatment

Success of Non-Operative Treatment Multi-Center Orthopaedic Outcomes Network (MOON) Group (2009)

- 327 patients enrolled with chronic full-thickness rotator cuff tears
- 3 months (including surgery or cured at 6 weeks)
  - ✓ 49/214 (22.89%)
- 1 year
  - ✓ 10/162 (6%) went to surgery
- 2 years
  - ✓ 0/28 have gone on to surgery
- A trial of rehabilitation may be indicated prior to proceeding with surgery in those patients with chronic full-thickness rotator cuff tears.

Surgical Indications

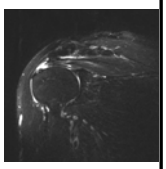
- Surgery indicated if acute trauma associated with significant weakness of the shoulder and posterior cuff involvement (infraspinatus, teres minor) or subscapularis involvement as seen with an anterior shoulder dislocation
- Young patients with higher functional demands
- Failure of 3-6 months of conservative management

Repair Techniques

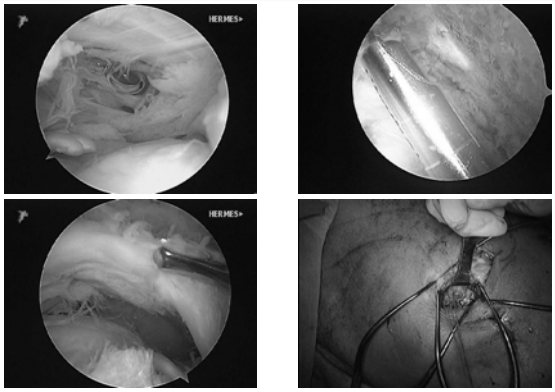
- Open
- Mini-open- combination of open and arthroscopic surgery
- All arthroscopic

Prognostic Factors for Success of Rotator Cuff Repair

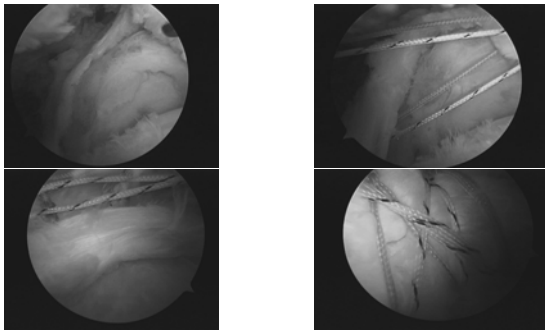
- A number of retrospective studies have identified features associated with poor outcome after surgical management:
  - Duration of symptoms
  - Fatty infiltration of the atrophied
  - Larger rotator cuff tears
  - Age of the patient
  - Worker's Compensation claims
  - Limited pre-operative ROM
  - Multiple comorbitities



Mini-Open Rotator Cuff Repair



All Arthroscopic Rotator Cuff Repair



Lindley and Jones, Am J Orthop, 2009

- **Systematic review of literature**
- **No difference in clinical outcomes with arthroscopic versus open repair**
- **Slight decrease in pain and increase in range-of-motion in short-term with arthroscopic repair**
- **Slight increase in re-tear rates in larger tears (>3 cm) with arthroscopic repair**

Arthroscopic Versus Open?

Conclusions

- **Diagnosis is made with a thorough history and physical examination in conjunction with radiographic studies.**
- **Not all rotator cuff tears need repaired**
- **Need to develop more definitive indications for surgery based on prospective studies**
- **Although trend is toward less invasive surgery, there are similar clinical/ radiographic results with arthroscopic and open repair**