Anything New In Management Of Anterior Shoulder Instability?

Dr. James J. Lam  
Centre for Orthopaedic Surgery  
Bank of America Tower, Hong Kong  
16 March 2005

Objective Of The Session

- To have some ideas on which the management of anterior shoulder instability patients
- To know how to ask the surgeon the relevant questions (if important information is missing...)
- To stimulate you to ask the appropriate questions for research (NOT RE-search)

Topics NOT Covered

- Basic science
  - Biological principles
    - Suture materials
      - Suture anchors
      - Biodegradable threads

How Do We Approach The Issue?

- New: <1 year
- Management: Dx, Ix and Tx
- Instability: symptomatic and pathological condition; not just laxity
  - What was the standard practice?
  - What is new / controversial / awaiting evidence?

What Was The Standard Practice?  
Up To mid 2004 (>1 Year Ago)

- Clinical Evaluation
- Investigation
- Treatment
  - Conservative
  - Surgery
    - Open
    - Arthroscopic
  - Rehabilitation
  - Return to sports

Shoulder Instability Classification

- Degree
  - Dislocation
  - Subluxation
  - Subtle
- Direction
  - Unidirectional
    - Anterior (95%)
    - Posterior (5%)
    - Inferior
  - Bidirectional
    - Anteroinferior
    - Posteroinferior
    - Multidirectional
- Etiology
  - Traumatic (macrotrauma)
  - Atraumatic
    - Voluntary (muscular)
    - Involuntary (positional)
  - Acquired (microtrauma)
  - Congenital
  - Neuromuscular (Erb’s palsy, cerebral palsy, seizures)
- Frequency
  - Acute (primary)
  - Chronic
  - Recurrent
  - Fixed (rare)

Pollock and Flattow
History

It Should Tell You the Type and Direction (DDEF) Before P/E

History (DDEF)

- Predominant sport / activity (Sports specific laxity pattern)
- When do symptom occurs
  - Onset
  - Progression
  - Definite traumatic episode
- What position create symptoms
- Direction it seems to go
- Nature of Instability
  - Degree
  - Disability
  - Frequency
- Specific symptom
  - Dead Arm Syndrome
  - Sudden sharp or paralyzing pain when forcibly moved into max. ER
  - Weakness
  - Catching / Popping sensation
- Other concerns
  - Secondary gain / Psychiatric Hx (Voluntary)
  - PH: Medical / Surgical
  - Family Hx
  - Medication

Chief Complaint

Macro Trauma
- Acute dislocation
- Recurrence following a dislocation

Micro Trauma
- Pain
  - Anterior shoulder pain during the cocking stage: anterior instability
  - Pain during the follow-through stage: posterior instability
- Feeling
- Poor Performance
- Sports
- ADL

Concept Of SLAP And Instability

The disabled throwing shoulder: spectrum of pathology
Burkhart SS, Morgan CD, Kibler WB
Arthroscopy 2003

Evolution Of The Biomechanical Understanding Of SLAP Lesion

"Dead arm" in throwing sportsman
- Any pathologic shoulder condition
- Unable to throw with preinjury velocity & control
- Discomfort in late cocking or early acceleration phase
- Sudden sharp pain & the arm "goes dead"

Previously Suspected Cause Of “Dead Arm” ..... Mysterious

- Psychopathology
- Posterior glenoid calcifications
- Acromial osteophytes
- Coracoacromial ligament impingement
- Rotator cuff problems
- Biceps tendinitis
- Acromioclavicular joint dysfunction
- Microinstability
- Internal impingement
- SLAP lesion
Current Thinking Of SLAP .... & “Dead Arm”

Circle Concept Of Pseudolaxity

P/E Is Important And Reliable

Imaging

- An assessment of the interexaminer reliability of tests for shoulder instability
  - Tzannes A., Pashos A., Callanan M., Murrell G.A.
  - J Shoulder & Elbow Surgery 2004
  - Load-and-shift, sulcus, and provocative tests are reliable when care is taken in performing
- An evaluation of the apprehension, relocation, and surprise tests for anterior shoulder instability.
  - Lu DK, Nonweiler B, Woolfrey M, Litchfield R.
  - ASRM 2004
  - A positive instability exam on all three tests is highly specific and predictive

- Provocative Test
  - Apprehension
  - Relocation
  - Jerk test
  - Forced ER
  - Impingement test
- SLAP Test
  - Speed’s
  - O’Brien
- Others
  - Scapulothoracic movement
  - Humeral version
  - Neurology / Cervical

Physical Examination

- Look
- Feel
- Move
  - Active
  - Passive
- Rotator Cuff / Strength
  - Age > 50: look for cuff lesion
- Translation Test
  - Load and shift (seated and supine)
  - Sulcus sign
- Provocative Test
- Slap Test
- Speed’s
- O’Brien
- Others
  - Scapulothoracic movement
  - Humeral version
  - Neurology / Cervical

Centre for Orthopaedic Surgery

Generally Will Not Be Necessary
To Make the Dx of Instability,
BUT May Find
Co-existing Pathology
Investigation For Anterior Dislocation

Imaging

- XR
  - Subtle signs of instability
    - Anteroinferior glenoid
    - Hill-Sachs
    - Humeral head cyst
    - Others
      - Bennett’s lesion
      - Calcification of posterior inferior glenoid in overhead athletes
      - ACJ
      - Impingement signs
- CT
  - Good for bony lesion
  - +/- arthrogram
- MRI
  - Soft tissue
    - Cuff, Biceps and Subscapularis
    - Labrum
    - CHL
    - HAGL
  - +/- arthrogram

Strategies for Radiological Dx

- Sports-related injuries of the shoulder: instability
  - Plain radiographs
    - Diagnose acute dislocations & assess reductions
    - Demonstrate Hill-Sachs & osseous Bankart lesions
  - Conventional MRI
    - Acute setting: nicely demonstrates labral Bankart, ligamentous and tendinous injuries
  - MRI arthrography
    - Chronic instability
  - Multi-slice CT arthrography
    - Postoperative shoulder
    - Recurrent instability after operation
  - High field (0.5 Tesla or greater) open magnets
    - Physiological relationships with motion and stress

Unfortunately outcomes data is lacking

Research Related To Imaging

- Anterior shoulder instability modifies glenoid subchondral bone density
  - Schulz CU. Anetzberger H. Pfahler M. Refior HJ
  - CORR 2004
    - Computed tomography osteoabsorptiometry
  - Sugimoto K
  - J Shoulder & Elbow Surgery 2004
  - Detection of Bankart lesions with an axillary approach
    - Sensitivity of 88.6%, a specificity of 77.4%, an accuracy of 84.0%, a positive predictive value of 84.8%, and a negative predictive value of 82.8%

Management of Anterior Instability

Management - Non-op

- Immobilisation
  - Pain Mx
  - Arm sling / neutral rotation brace
  - Time of immobilisation
    - Not as critical as before,
      - 3-4 weeks
  - In-season athlete
    - Regain muscle control
    - Brace to limit abd. & ER
  - Strengthening
    - Periscapular
    - Cuff
    - Power Movers (Pec., Deltoïd, LD)
  - Proprioceptive training
    - Taping
    - PNF (proprioceptive neuromuscular facilitation)
  - Functional Progression
    - Sports specific drilling
    - Throwing
    - Criteria for return-to-play
      - Pain free
      - Full ROM
      - Normal strength

- USG
  - Reader dependent
  - Sensitive for soft
- USG
  - Reader dependent
Immobilisation in ER?
- A new method of immobilization after traumatic anterior dislocation of the shoulder: a preliminary study
  Itoi E, Hatakeyama Y, Kido T, Sato T, Minagawa H
  J Shoulder Elbow Surg 2003
  - 40 patients with initial shoulder dislocations
    (1) immobilization in IR: 30% recurrence
    (2) immobilization in ER: 0% recurrence
    Aged <30 years (45% in the IR group and 0% in the ER group)

Immobilization for 3-4 weeks?
- The effectiveness of rehabilitation for nonoperative management of shoulder instability: a systematic review
  Gibson K, Grosse A, Korda L, Bray E, MacDermid JC
  J Hand Therapy 2004
  - A systematic review of published evidence on conservative management
  - Outcomes considered included recurrence of instability and return to premorbid function
  - Overall, the quantity and quality of evidence were low
  - Immobilization for three to four weeks followed by a structured 12-week rehabilitation program of range of motion and glenohumeral and scapular stability exercises for patients with primary dislocations to maximize return to premorbid activity level is supported by weak evidence
  - Level II evidence suggests that recurrence is lower in patients managed with surgical as compared with conservative management
  - Further research is required to delineate the optimal approach to rehabilitation and its role in secondary prevention

Do We Use Bracing?
- Managing anterior shoulder instability with bracing: an expanded update
  Reuss BL, Harding WG 3rd, Nowicki KD
  Orthopedics 2004
  - Classification of shoulder braces
    Type A limits shoulder motion to a “safe zone”
    Type B applies indirect stabilizing forces
    Type C applies direct to the joint
  - 13 braces surveyed
  - Comparing features
    Comfort, convenience, construction, cost, potential sport use & special features
  - Problem areas
    Poor fit & range of motion restriction

Natural Hx: Recurrence Rate
Sling (IR) immobilisation for 1st Time Dislocator

<table>
<thead>
<tr>
<th>Study</th>
<th>Recurrence Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>McLaughlin 1950</td>
<td>30-39</td>
</tr>
<tr>
<td>Rowe 1961</td>
<td>75</td>
</tr>
<tr>
<td>McLaughlin 1961</td>
<td>95</td>
</tr>
<tr>
<td>Hovelius 1978-1987</td>
<td>55 (elite hockey)</td>
</tr>
<tr>
<td>Rowe 1980</td>
<td>94</td>
</tr>
<tr>
<td>Henry 1983</td>
<td>38</td>
</tr>
<tr>
<td>Sirvenen 1984</td>
<td>82 (Ath.)</td>
</tr>
<tr>
<td>Andrews 1984</td>
<td>85 (Navy)</td>
</tr>
<tr>
<td>Wheeler 1989</td>
<td>92</td>
</tr>
<tr>
<td>Kirkley 1999</td>
<td>47</td>
</tr>
</tbody>
</table>

Focusing on the <25 & <30 High Demand Group
- Is traditional treatment good?
  - Sling
  - Muscle strengthening
  - Wait for recurrence
- 60-94% chance for it to recur
  ER immobilisation may be the answer

Should We Treat First Time Dislocator?
- In 2004
  The answer is “Yes”
Cochrane Evidence Based Review

- Surgical versus non-surgical treatment for acute anterior shoulder dislocation

  - Limited evidence available supporting primary surgery for young adults engaged in high risk of re-dislocation.

  - There is no evidence available to determine whether primary surgical treatment should be offered to patients in whom the risk of re-dislocation is uncertain.

  - For patient categories at lower risk of activity-limiting recurrence, reviews comparing different surgical interventions and different conservative interventions including rehabilitation are needed.

  - Sufficiently powered, good quality and adequately reported randomised trials of good standard surgical treatment versus good standard conservative treatment for well-defined injuries are required.

  - Long term surveillance of outcome, looking at shoulder disorders including osteoarthritis is also required.

Management - Operative

- Open or Arthroscopic
  - Not the key issue

- Key Issue
  - Repair the injured structures
  - Approach is guided by Direction
    - Anterior
    - Posterior
  - Multi-directional (Can your arthroscopic technique handle the inferior pouch)

Lavage Alone Does Not Work

- A prospective arthroscopic study of acute first-time anterior shoulder dislocation in the young: a five-year follow-up

- Unlikely that arthroscopic lavage reduces redislocation rates after AFASD in the young patient

Thermal Capsulorrhaphy: The Pendulum Swings

- Prospective evaluation of thermal capsulorrhaphy for shoulder instability: indications and results: two- to five-year follow-up.

- The high rate of unsatisfactory overall results (37%), documented with longer follow-up, is of great concern.

- Enthusiasm for thermal capsulorrhaphy should be tempered until further studies document its efficacy

Arthroscopy or Open

- Arthroscopic versus open treatment of anterior shoulder instability

  - Open repair
    - Accepted mainstay
    - Consistently good clinical results
  - Arthroscopic
    - With the development of newer arthroscopic techniques
    - May eventually provide equivalent long-term efficacy
Arthroscopy or Open

- Arthroscopic treatment of anterior glenohumeral instability: indications and techniques
  - Cole BJ, Millett PJ, Romeo AA, Burkhart SS, Andrews JR
  - Instructional Course Lectures 2004
  - Viable treatment option: reported success rates parallel those of open
  - Success rate
    - Advances in surgical techniques and technology
    - An improved understanding of the pathoanatomy
    - Continuing education initiatives

Basic Principles

<table>
<thead>
<tr>
<th>Important considerations</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Identifying all pathology</td>
<td></td>
</tr>
<tr>
<td>- Mobilizing soft tissue</td>
<td></td>
</tr>
<tr>
<td>- Enhancing the local biology to promote soft-tissue healing</td>
<td></td>
</tr>
<tr>
<td>- Securing anatomic fixation</td>
<td></td>
</tr>
<tr>
<td>- Respecting the healing period during postoperative rehabilitation</td>
<td></td>
</tr>
<tr>
<td>- Significant bone deficits</td>
<td></td>
</tr>
<tr>
<td>- &gt;20% glenoid</td>
<td></td>
</tr>
<tr>
<td>- &gt;30-40% Hill Sachs</td>
<td></td>
</tr>
<tr>
<td>- Inability to repair capsular avulsions or rupture (Poor capsular quality)</td>
<td></td>
</tr>
<tr>
<td>- Relative contraindication: contact sports and revision?</td>
<td></td>
</tr>
</tbody>
</table>

Choice of technique...

- Sutures
  - Suture anchors
  - Metal implants
  - Biodegradable tacks

Bumper Effect

- Anchors at the rim of the glenoid
- Pass the suture through the labrum
- Use a barrel stitch to gather up the capsule to re-form an anterior bumper

How to repair it.....

- Six Essential Steps
  1. Diagnostic arthroscopy
  2. Debride GH joint
  3. Prepare capsule-ligament complex
  4. Prepare the reattachment site
  5. Attach cap-lig. complex to bone
  6. Wound closure & Post-op care

Adherence to these principles should lead to excellent results.
......Attach Cap-lig. Complex to Bone....

......Knot Tying.... Repeat 3 Times.....

Current Trend For Arthroscopy
- Good for first time dislocator
- High demand overhead athletes
  - Serious consideration because cannot afford a higher failure rate
  - Results are promising
  - Viable option if expertise available

Arthroscopic Stabilisation – Failure of Indication Rather Than Technique

<table>
<thead>
<tr>
<th>Ideal Candidate</th>
<th>Poor Candidate</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Acute</td>
<td>- Chronic</td>
</tr>
<tr>
<td>- Unidirectional</td>
<td>- Generalised laxity</td>
</tr>
<tr>
<td>- Bankart</td>
<td>- No Bankart</td>
</tr>
<tr>
<td>- Robust tissue</td>
<td>- Poor tissue quality</td>
</tr>
<tr>
<td>- &lt;3 dislocation</td>
<td>- &gt;3 dislocations</td>
</tr>
<tr>
<td>- Internal impingement</td>
<td>- Habitual dislocators</td>
</tr>
<tr>
<td>- Subluxation</td>
<td></td>
</tr>
</tbody>
</table>

......We see more.....

- Bony Bankart
- Labral tear
- Capsular tear
- BHAGL
- IGHL insufficiency
- SLAP
- Hill Sach
- Cuff tear

......Lesions Other Than Bankart.....

- The anterior labroligamentous periosteal sleeve avulsion lesion: a cause of anterior instability of the shoulder
  - Nevisser TJ 1993 Arthroscopy
- The BHAGL lesion: a new variant of anterior shoulder instability
  - Oberlander MA 1996 Arthroscopy
- Combined Bankart and HAGL Lesion Associated With Anterior Shoulder Instability
  - Warner JJP 1997 Arthroscopy
We See More In Arthroscopy

- Arthroscopic findings in atraumatic shoulder instability
  - Capsulolabral complex (100%)
  - Hill-Sachs lesions (60.5%)
  - Chondral lesions of the glenoid (23%)
  - SLAP lesions (11.7%)
  - Partial, articular-side defects of the supraspinatus tendon (6.9%)

Causes of Failure After Surgical Repair

- Reasons for failure after surgical repair of anterior shoulder instability
  - Recurrence of instability
  - Loss of motion
  - Neurovascular injury
  - Hardware complications

SUCCESS = You never see your patient coming back again ???

“Ideal” Criteria For Return To Play

- Shoulder instability: return to play
  - Little/no pain
  - Patient subjectivity
  - Near normal range of motion (ROM)
  - Near normal strength
  - Normal functional ability
  - Normal sports-specific skills

Suggested Reading

- The disabled throwing shoulder: spectrum of pathology
  - Burkhart SS, Morgan CD, Kibler WB
  - Arthroscopy 2003

- Sports-related injuries of the shoulder: instability
  - Farber JM, Buckwalter KA
  - RCNA 2003

- A new method of immobilization after traumatic anterior dislocation of the shoulder: a preliminary study
  - Itai E, Hatakeyama Y, Kido T, Satoh T, Minagawa H
  - J Shoulder Elbow Surg 2003

- Surgical versus non-surgical treatment for acute anterior shoulder dislocation
  - Handoll HH, Almaiyah MA, Rangan A
  - Cochrane Database of Systematic Reviews 2004

- Shoulder instability: return to play
  - McCarty EC, Ritchie P, Gill HS
  - CJSM 2004

Summary

- To have some ideas on which the management of anterior shoulder instability
- To know how to ask the surgeon the relevant questions (if important information is missing...)
- To stimulate you to ask the appropriate questions for research (NOT RE-search)
Thank You!

Anything New In Management Of Anterior Shoulder Instability?

Dr. James J. Lam

Centre for Orthopaedic Surgery
Bank of America Tower, Hong Kong
16 March 2005