The diagnosis and management of common shoulder disorders

Jaime Candal-Couto
Consultant Orthopaedic Surgeon
Glenohumeral joint
Package
The Subacromial Space
Bones & Joints

- ELEVATION involves all 5 JOINTS
- EXTERNAL ROTATION only involves GLENOHUMERAL JOINT
CORACO-ACROMIAL LIGAMENT
The Rotator Cuff

- Subscapularis
- Supraspinatus
- Infraspinatus
- Teres minor

- Rotator cuff Interval
- Long-head of biceps
The Rotator Cuff

- Rotate the humerus with respect to the scapula
- Compress the humeral head into the glenoid fossa, a critical stabilizing mechanism
- Provide fine muscular balance of humeral motion
SUBACROMIAL BURSA
supraspinatus

Critical zone, Hypovascular? Prone to calcific deposits and tears
Nerves

- Cervical Spine: C5/6
- Brachial plexus:
  - Branches to scapular muscles
  - Axillary nerve
  - Suprascapular nerve
Common Shoulder Disorders
SHOULDER PROBLEMS:

Pain and....

- INSTABILITY
- STIFFNESS
- "IMPINGEMENT"
- WEAKNESS
Making a diagnosis... Pain and:

<table>
<thead>
<tr>
<th>STIFF</th>
<th>UNSTABLE</th>
<th>“PAIN &amp; WEAKNESS ON ELEVATION”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of External Rotation</td>
<td>Shoulder dislocates</td>
<td>Pain on elevation, IR, Night pain</td>
</tr>
<tr>
<td>MUST HAVE X-Ray</td>
<td>?recurrent</td>
<td>EXTREMELY COMMON</td>
</tr>
<tr>
<td>Arthritis, AVN, tumour</td>
<td>MRI arthrogram</td>
<td>Rotator Cuff tears, Biceps tendon, Subacromial impingement, AC arthritis…</td>
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<tr>
<td>FROZEN SHOULDER</td>
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<td></td>
</tr>
</tbody>
</table>
1: THE STIFF SHOULDER

- LACK OF EXTERNAL ROTATION
- X-RAY
  - NORMAL:
    - ADHESIVE CAPSULITIS/FROZEN SHOULDER
  - ABNORMAL:
    - ARTHRITIS
    - TUMOUR
    - AVASCULAR NECROSIS
    - SEPSIS
Adhesive Capsulitis

- Pathophysiology uncertain but numerous theories proposed
- Rotator interval primarily involved
- What occurs is a very significant synovitis followed by capsular and ligamentous fibrosis
- NORMAL X-RAY
Adhesive capsulitis

- Middle aged
- Bilateral but not usually simultaneous
- F>M
- Common in diabetics
Never make the diagnosis of frozen shoulder in the young or the elderly!!
ADHESIVE CAPSULITIS

- MY PRACTICE
  - PATIENTS WANT TO GET BETTER TOMORROW RATHER THAN IN 2 YEARS TIME.
  - IF EARLY: GLENOHUMERAL INJECTION
  - IF ALREADY STIFF: MUA + INJECTION
  - IF STIFF AND LATE: ARTHROSCOPE CAPSULAR RELEASE
ADHESIVE CAPSULITIS

- MANAGEMENT VARIES WIDELY
- NATURAL HISTORY?
  - PAIN-STIFFNESS-RESOLUTION
  - DOES IT ALWAYS GET BETTER AFTER 2 YEARS?
ADHESIVE CAPSULITIS

- Very good results in primary condition
- Post-traumatic and diabetics less predictable.
- URGENT REFERAL
THE ARTHRITIC SHOULDER

- OA
- RhA
- AVN
- CUFF ARTHROPATHY
THE ARTHRITIC SHOULDER

- INDICATION FOR SURGERY: INTRACTABLE PAIN
- SURGERY: JOINT REPLACEMENT
- ARTHROSCOPIC AND SOFT TISSUE SURGERY UNLIKELY TO HELP
JOINT REPLACEMENT

- STATE OF ROTATOR CUFF IS THE SINGLE MOST IMPORTANT FACTOR IN PREDICTING OUTCOME:
- OA & AVN = GOOD PAIN RELIEF AND FUNCTION
- RhA & CUFF ARTHROPATHY: PAIN RELIEF ONLY.
ARTHROPLASTY OPTIONS

- HUMERAL HEMIARTHROPLASTY VS TOTAL SHOULDER REPLACEMENT
- HUMERAL RESURFACING VS STEMMED PROSTHESIS
- REVERSE POLARITY PROSTHESIS.
Cuff Arthropathy

- Elderly
- Pseudoparalysis
- Weakness > stiffness
Delta CTA™ Reverse Shoulder
2: Recurrent Instability

- Traumatic
  - TUBS
  - “Tight Tom”
  - “Torn Loose”

- Atraumatic
  - AMBRI
  - “Slack Alice”
  - “Born Loose”
Muscle Pattern Instability

Atraumatic Structural Instability

Traumatic Structural Instability
Static Stabilizers (structural)
TRAUMATIC INSTABILITY
Traumatic recurrent anterior instability

- **Spectrum:**
  - dislocation-------------------subluxation

- Young dislocators >90% capsulolabral injury
Bankkart
HAGL
Traumatic recurrent anterior subluxation

- Making the diagnosis is the challenge
  - MRI
  - MRI arthrogram
  - EUA and arthroscopy

- If pathology confirmed, treat as recurrent dislocators

- Impingement in the young: instability till proven otherwise
Traumatic recurrent anterior instability

- Physio may help rehabilitation but does not prevent further dislocations.
- Operative treatment clearly superior at reducing recurrence
- Surgery reduces risk of post traumatic arthritis.
OPEN SURGERY:

CUT HERE
OPEN SURGERY:

ATTACH THIS

THERE
OPEN SURGERY:

REPAIR & TIGHTEN THE CAPSULE
ARTHROSCOPIC SURGERY:

NO NEED TO CUT HERE

GRAB THE LABRUM AND ATTACH IT TO GLENOID
STABILIZATION SURGERY:

- 15-20% RECURRENCE
- NOT WITHOUT RISKS!
RISK OF RECURRENCE

- STUDIES VARY WIDELY BUT ROUGHLY...
Traumatic anterior Instability

- Recurrent: Surgery
- First-time:
  - Splint in External rotation
  - Surgery if recurrent
RISK OF RECURRENCE

AGE
Age >40

- High incidence of unhappy patients

- **ON-GOING:**
  - PAIN
  - WEAKNESS
  - STIFFNESS
The rotator cuff is the weak link
POSTERO-SUPERIOR CUFF

ANTERIOR

POSTERIOR
CUFF TEAR
DO NOT MISS A LARGE TRAUMATIC CUFF TEAR IN A MIDDLE AGE WORKING PERSON AFTER A SHOULDER DISLOCATION

IF YOU REPARE IT EARLY YOU WILL IMPROVE THE PROGNOSIS DRAMATICALLY
Atraumatic Structural Instability

- SURGERY HISTORICALLY HAS PRODUCED MANY DISASTERS
  - THERMAL CAPSULORRHAPHY

- Capsular Shift May help
LAXITY
Muscle pattern instability

- NEED SPECIALIST PHYSIO
- Diagnostic challenge
- Bizarre scapulo-humeral rhythm and abnormal patterns of muscle contractions
3: “Pain on Elevation”
“It hurts when I raise my arm and when I reach out for things.

It is really sore at night, cannot find a comfortable position

I find it difficult to reach my back”
“My GP said it was Tendinitis and gave me an injection which took the pain away for a few weeks, The physiotherapist thinks it is Bursitis. Also talks about Impingement What do you think?”
“I think you may have a Cuff Tear”
It is all very confusing
CORACO-ACROMIAL LIGAMENT
supraspinatus

Critical zone, Hypovascular? Prone to calcific deposits and tears
Failure of rotator cuff is commonly linked to shoulder symptoms
AGE IS THE SINGLE MOST IMPORTANT FACTOR CONTRIBUTING TO CUFF FAILURE
FORCE REQUIRED TO DISRUPT CUFF TENDON FIBRES

INCREASING AGE
THICKENED C-A LIGAMENT

TENDON DEGENERATION
“BURSITIS”
ADDITIONAL FACTORS

- Compressive loads against coraco-acromial arch
- Critical zone more susceptible
- Changes in the coraco-acromial arch
- Role of trauma?
“PROGRESSIVE CUFF FAILURE”
WHEN A FIBRE OF TENDON FAILS...

- Increases the load on the neighbouring, unruptured fibres, giving rise to the “zipper phenomenon”
- Detaches muscle fibres from bone, diminishing the force that the cuff can deliver
- Distorts local anatomy & blood supply, leading to progressive ischaemia
- Exposes more tendon to lytic enzymes of joint fluid
WHEN A FIBRE OF TENDON FAILS

- Inflammatory response
- Ischaemia
- Mechanical compromise

- All possible causes of pain
What do we see

- Inflamed tendon
- Partial thickness tears
- Full thickness tears
- Massive tears
DO TEARS HEAL??
NATURAL HISTORY

- 80% of partial thickness tears will progress
- …but symptoms may improve
  - Yamanaka et al 1983
Traumatic Cuff Tears

- Healthy tendon is extremely strong and bony avulsion more likely to occur.
- Acute traumatic tears occur in degenerative cuff.
Incidence

- Cadaveric studies: 5-30%
  - More common in older groups
  - Partial thickness tears twice as common
Incidence

- MRI & Arthrogram studies in asymptomatic individuals:
  - 50% over 70 years of age
  - 80% over 80 years of age
  - Partial thickness tears commoner in younger groups
    (24% age 40-60, 4% age less than 40)
Bilateral tears are extremely common!
Clearly, we do not understand why some patients are symptomatic.
Clinical Scenarios:

- Asymptomatic Cuff Failure
- Stiffness
  - Posterior Capsule tightness
- Weakness
- Pain on muscle contraction
- “Cuff pain”
- Crepitus
- Cuff Arthropathy
Clinical examination
Differential Diagnosis

- ACJ arthritis
- LHB pathology
- Suprascapular nerve pathology
- C5-6 cervical spondylosis
Treatment
Since we do not understand the correlation of pathophysiology and symptoms very well ...

...it is even more difficult to know how to best treat the patient!
Non-operative management should be the first line of action. But consider surgery in acute traumatic full-thickness tears (e.g., after dislocation).
Many patients may improve their symptoms despite progression of cuff failure
Non-operative management

- Reassurance
- Physiotherapy
- Subacromial Injections
Surgery

- **Open or Arthroscopic**
- **Subacromial decompression**
  - CA ligament release
  - Acromioplasty
  - Debridement of bursa
- **Cuff repair**
Surgery

- If non-operative management fails
- Severe symptoms
- Longstanding symptoms

- Can be extremely successful
- Can be a waste of time

- Rapidly evolving field!
Outcomes of surgery...

- Confusing, because indications for surgery are not strict
- Typically “70-80% good-excellent results at 5 years”
- Lack of comparative studies!!!
C-A Ligament release

Analogy with Trigger finger etc??
Other causes of pain on elevation

- ACJ pathology
- Long Head of biceps pathology
ACJ PAIN
ACJ PAIN

- ARTHRITIS
- AVN IN WEIGHT LIFTERS
- Intra-articular disc related pain?
ACJ PAIN

- Localised pain to ACJ?
- Other pains in shoulder also?
ACJ injection

- Very good diagnostic value
- May provide long term relief
ACJ RESECTION

- REMOVAL OF LATERAL 50-10MM OF CLAVICLE.
- OPEN SURGERY
- ARTHROSCOPIC SURGERY
- USUALLY SUCCESSFUL
LHB

- POORLY UNDERSTOOD
- “HOURGLASS BICEPS”
- “TRIGGER BICEPS”
LHB

- BICEPS TENOTOMY
- BICEPS TENODESIS
Summary
Management Summary

- Stiff shoulder: X-ray, consider early referral
- Instability: MRI arthrogram
  - Traumatic recurrent: Surgery
  - Other: Specialist Physio
- Pain on elevation: USS +/- Xray
  - Differentiate traumatic cuff tear from degenerative cuff defect
  - Be aware of possible diagnosis
  - Conservative treatment first
Thanks