Current Treatment of Shoulder Instability

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Anatomy

STATIC
- Capsule
- Labrum
- G-H ligaments
- Bony

DYNAMIC
- Rotator cuff
- Biceps tendon
- Deltoid
- Negative pressure

Static Restraints

- Capsule/ligaments (IGHL)
  - Capsular tear or plastic deformation
- Glenoid labrum
  - Detachment (Bankhart lesion)
- Bony restraint
  - Glenoid or humeral head bone deficit

Inferior Glenohumeral Ligament

Hammock Concept

0 Degrees Abduction

45 Degrees Abduction
90 Degrees Abduction

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Labrum
- Labrum increases glenoid fossa depth by 50%
- Provides attachment for capsule/ligaments

Static Restraints
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Glenoid
- Glenoid=golf tee

Glenoid
Dynamic Restraints

- Rotator cuff
- Long head of Biceps tendon
- Negative intra-articular pressure
- Fluid adhesion/cohesion

Rotator Cuff Dysfunction and Scapular Dyskinesis

Multidirectional Instability

- 90% non operative
- “Hyperlaxity”
- Modified Galle with CHL/SGHL recon?
- One way bus ticket to Tulane

Posterior Instability

- Often Delayed Diagnosis
- Variable labral pathology
- Often seen in athletic population
- Differentiate from MDI

Posterior Instability

- Type 1 – Traumatic
  - Dislocation
  - Subluxation
- Type 2 – Atraumatic
  - Typically subluxators
  - Voluntary: A) Habitual B) Muscular control
Mechanism of Injury

• Direct:
  – force at directed at the proximal humerus

• Indirect
  – Flexion, internal rotation, & adduction

Clinical Examination

Posterior Laxity Testing

Arm forward flexion
Internal Rotation
Adduction
Posterior Directed Force

Acute Posterior Dislocation

• < 20% humeral head defect
  – Closed reduction, abduction splinting

• 20-40% humeral head defect
  – Subscap transfer with or without LT
  – Abduction splinting
  – Posterior labral stabilization
  – Posterior block procedure

Chronic Posterior Dislocation

• Under anesthesia, closed → open reduction

• < 20% defect
  – Splint

• 20-40% defect
  – Transfer subscap
  – Posterior labral repair

• > 40% defect
  – Humeral head replacement
  – Consider matched allograft for younger patient

Inferior Instability
Luxatio Erecta

Anterior Traumatic-most common

- Traumatic unidirectional-excessive force to an abducted externally rotated arm
- Bankhart
- A spectrum of injury can exists

Recuption Techniques

- Traction-counter traction
- Modified Stimpson
- Scapular Manipulation
- Milch
- Ancient Chinese Secret

Clinical Evaluation

- Provocative maneuvers (drawer)

Clinical Evaluation

- Provocative maneuvers (apprehension)

Clinical Evaluation

- Provocative maneuvers (relocation)
Exam Under Anesthesia

- Gold Standard
- True test of static stabilizers
  - No active resistance
  - Important part of diagnostic/treatment algorithm

Radiographs (need orthogonal views)

MRI

Non-Operative Treatment

- Immobilization (duration)
  - No change in outcome? (Hovelius et al., 1983; Rowe et al., 1961)
  - One week (Kazar et al., 1969)
  - Three weeks (Kiviluoto et al., 1980; Stromsoe et al., 1980)
  - Dependent on age?

Nonoperative Management

- Immobilization (position)
  - Internal rotation and adduction (sling)
  - Labrum anatomically better position in ER (Itoi et al., 2001)

Non-Operative Management

- Immobilization (position)
  - Clinical follow-up for 15 months (Ho et al., 2003)
  - No recurrent dislocation with ER immobilization
  - 30% dislocation with IR immobilization
  - 0% vs. 45% for patients younger than 30
Immobilization in external rotation after shoulder dislocation reduces the risk of recurrence. A randomized controlled trial.

- 198 int vs ext rotation, 2 year f/u
- 26% vs 42% recurrence rate
- particularly high in patients who are thirty years of age or younger.

Surgical Treatment

- Open vs Arthroscopic?
- Many factors to be considered
- Age?
- Previous failure?
- Contact athlete?
- A little scary

Re-establish normal anatomy

Open Treatment-Deltopectoral Approach
Results

- Traditional Bankart Repair for Ant. Inst.
  - % recurrence 0.0 to 13%
  - G/E results in range of 90+%
  - Rate of return for throwers 0-64%

Why stabilize arthroscopically?

Advantages

- Identify and treat co-morbidities (i.e. SLAP, RC tears, chondral pathology, posterior instability)
- Less pain
- Less morbidity
- Less risk of over tightening
- Potentially less costly (less surgical time)
- Cosmetically desirable ‘minimally invasive’
ASSOCIATED LESIONS

- Snyder
  - PRCT - 29%
  - FRCT - 11%
  - SLAP - 22%
  - AC joint lesions - 16%
  - Articular injury - 10%

Disadvantages

- Can’t address traumatic bony defects (glenoid fracture>20%, Hill Sachs>40%)
- Can’t address glenoid hypoplasia or version problems
- HAGL lesions?
- Technically challenging
- Higher recurrence rates in contact athletes

Early Arthroscopic Results

- Grana 44% recurrence rate
- Walch 49%
- Green 42%
- Caspari 20%

Results - Arthroscopic

- Cole et al, JBJS 2000
  - 63 pts, 2-6 year follow-up
  - G/E 84% with scope vs. 91% open
  - 75% return to play in each group
  - 24% unsatisfactory with scope
  - 18% unsatisfactory with open
  - No randomization
  - Scope pts had less instability
    - Significant selection bias

Arthroscopic vs. Non-op Tx

- Bottoni, Arciero, et al AJSM 2002
  - 14 non-op vs 10 arthroscopic bankart repairs
    - Repaired with suture (1 or 2)
    - Same rehab protocol
      - Both had 4 weeks immobilization
  - 75% of non-op tx had recurrent instability
  - 11% of arthroscopically tx had recurrence
  - Avg follow-up was 36 months
Arthroscopic vs. Open

- Bottoni et al, AJSM 2006
  - 64 randomized patients recurrent anterior instability
- Shorter OR time for Arthroscopic
- Greater motion loss with open
- Same failure rate

Recent Arthroscopic Results-Improved

- Field 8% recurrence of dislocation
- Fabbricianni 0%
- Gartsman 7.5%
- Romeo 0%
- Abrams 6%
- Kim 4%
- Gold standard

Arthroscopic vs. Open longer f/u

- Harris et al, Arthroscopy 2013
- Reviewed 26 studies with mean f/u 11 years
- Recurrent instability
  - open 11%
  - arthroscopic 8%

But…Results in Contact Athletes not as good!

- Mazzoca 11% AJSM 2005
- Idle 9.5% AJSM 2004

WHY??

Bone Deficiency

Dozens of peer-reviewed articles

Highest risk for failure is bone loss

Tauber et al-56% of failures due to bone loss

Humeral side-Hill Sachs Lesion
Mechanism of Hill Sachs Deformity

Engaging Hill-Sachs Lesion

“On Track” and “Off Track”

Remplissage

Described by Wolf 2002

“to fill a void”

Designed as an adjunct to arthroscopic Bankart

Glenoid side- what is “significant”?  

Acute injuries and Bone loss <25%

Still amenable to capsulolabral repair +/- inclusion of bone fragment

Suguya technique

Glenoid Bone Loss >25%

“Inverted Pear glenoid”-Burkart 2000

Unacceptable risk of failure…  

DeBeer  

Boileau  

Griffith  

Bigliani  

Failure rate highest in contact athletes
Successful Treatment for Glenoid Loss > 25%

- Capsulolabral repair alone - Open or arthroscopic?
- Iliac crest autograft
- Distal tibial allograft - Provencher
- Coracoid transfer - Bristow/Latarjet

LATARJET procedure

- "Triple Blocking" (D. Patte)
- Bony effect: increase or restore the AP glenoid diameter
- Ligament effect: suture the capsule to the stump of the CA ligament
- Muscular effect: the inferior 1/3 of the subscapularis = AIGHL

Hammock effect of the inferior third of the subscapularis

Position of Block

- Inferior edge – Burkart/DeBeer
- Two parallel screws
- Nourissat et al - Biomechanical study….
- 4 O’Clock position
- Lower position = increase in axillary nerve palsy

Results

- Edwards et al, 2002
  - Reviewed > 1000 cases 1% recurrence rate
- Boileau et al
  - 3yr f/u 2% recurrence rate
- Favard et al
  - 13yr f/u 1.4% recurrence rate
- LaFosse-2007
  - Arthroscopic Latarjet: Low recurrence, steep learning curve

Higher risk of OA? - Results

- Concerns with Latarjet causing OA
  - Favard et al
    - 13 yr f/u 8.5% incidence of OA
  - Walch et al
    - 20 yr f/u 23.5% of cases, most mild

Similar to long term f/u for other treatments of instability
Decision Making…..what to do?

Bipolar Bone Loss
- Arthroscopic measurement - Burkart 2014
- Calculate ‘glenoid track’ 84% diameter
  \[ D = 2 \times \text{Radius} \]
- Measure to bare spot
  >25% = Latarjet

What causes recurrences? Really?
- Open Bankart Repair for the Treatment of Anterior Shoulder Instability without Substantial Osseous Glenoid Defects: Results After a Minimum Follow-up of Twenty Years.
- Moroder P\textsuperscript{1}, Odorizzi M\textsuperscript{2}, Pizzinini S\textsuperscript{2}, Demetz E\textsuperscript{2}, Resch H\textsuperscript{1}, Moroder P\textsuperscript{3}
- Conclusion: Higher recurrence rates in individuals involved in ‘Shoulder specific’ activity

Boileau’s Method
- Score developed to predict recurrence
- Calculated pre-op based on History, Exam, XR
- Scores >7 had 70% failure rate
- Scores <3 had 5% failure rate

Instability Severity Index Score - ISIS

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<td>Age at surgery</td>
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<td>History</td>
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<td>Level of sport</td>
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<td>None or recreational</td>
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<td>Visible in ER</td>
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<td>AP X-Ray</td>
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Prognostic Factors | Points
---|---
Age at surgery | 2
Greater than 20 | 0
History | 2
Competitive | 0
None or recreational | 0
Contact sport | 1
Yes | 0
No | 0
Exam | 1
Shoulder Hyperlaxity (>85 degrees ER) | 0
No | 0
Hill Sachs Visible in ER | 2
Not Visible | 0
AP X-Ray | 2
Glenoid bone loss | 0
Yes | 0
No | 0
Total | 10

Conclusion

- Must consider bone loss
- Contact athlete?
- Will long term results change our thinking?

Thank You