Shoulder Instability- What to do when all else fails? Dealing with Bone defects

Conflicts of Interest

1. Royalties/stock/equity
   1. Arthrosurface
   2. Zimmer

2. Consulting/Honoraria
   1. Stryker
   2. Arthrosurface
   3. Arthrex
   4. Smith and Nephew

3. Educational/Research
   Institutional
   1. Stryker
   2. Arthrex
   3. DJ Ortho
   4. NFL Charities
   5. MLB Charities
   6. Arthrosurface
   7. Breg

Shoulder Instability Surgery

- What factors are involved in successful surgery? (failures)
- Bone Defects- Glenoid and Humeral Head
- Modify treatment strategy depending on pathology
- Fix The Pathology by “Restoring the Anatomy”
Not a lot of indication in primary instability surgery—results of soft tissue repairs are excellent!

- Revision instability > 2
- Multiple dislocations > 5
- Epilepsy patients
- Contact athletes with bone loss?
- Fixed chronic, missed dislocations

Apprehension - 90 degrees of abduction

- Occurs at abduction angles below 45 degrees

How Much Instability Does a Humeral and/or Glenoid Bone Defect Contribute? Biomechanics
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Anthony Miniaci MD FRCSC

Displacement of Humerus

So what do I fix and when do I fix it?

Summary of Biomechanical Data and Clinical Experience
- The majority of bone defect problems can be dealt with by reconstructing glenoid - moves instability curve towards stability
- Glenoid >20%, HH > 30%
- When glenoid defect is > 30 % (rarer) latarjet(coracoid) not sufficient size
- When HH defect is >20-25% combined with glenoid consider fixing both

Treatment options
Good Rule-FIX the Pathology!

Glenoid Bone Loss
1. Bristow /Latarjet
2. Bone Graft- auto/allo

Humeral Bone Loss
1. Remplissage
2. Decreased ER
3. Arthroplasty
Latarjet Procedure - Reborn!

- Graft is placed so that it becomes an extra-articular platform that acts as an extension of the articular arc of the glenoid

Latarjet Procedure - Complications

- Systematic review
  - Griesser et al. JSES Feb 2013
- Dislocation arthropathy 36 %
  - Ladermann et al. Int Orth Jun 2013
- Inappropriate placement - guides
  - Meyer et al. JSES May 2013
- Inappropriate placement - guides
  - Ladermann et al. Int Orth Jun 2013
- Loss of external rotation
- Systematic review
  - Griesser et al. JSES Feb 2013
- 30 % complication rate
- 3 % redislocation
- Neurologic - MC, axillary
- hardware/bone complications (non union, fracture, displacement)
- 7% reoperation
- In the presence of HH bone loss increased ER increases stress on bone graft!? Non union, fractured screws ?

Allograft Reconstruction Results

- Tibial Allograft
  - Excellent 2-5 year results
  - Hardware and graft prep and placement important
  - >15 degree angulation
  - Arthroscopy 2009 Provencher et al
- Iliac crest allograft for recurrent instability in athletes
  - 10/10 no instability 94% WOSI
  - 80% osseous union @ 6 month
  - Arthroscopy 2014 Masri et al
- Allograft Reconstruction for glenoid bone loss in glenohumeral instability: a systematic review
  - 8 studies - 70 shoulders, 44.5 month f/u
  - Bone integration, no resorption in 100%, 94% satisfied
  - 3% dislocation, 4% arthrosis
  - Arthroscopy 2014 Sayegh et al
Remaining Problems with Glenoid graft?

- Goals-Anatomical reconstruction-minimize complications and Surgical prep time
- Latarjet- coracoid harvest- time, risks, complications
- Allograft/ Autograft Selecting and preparing appropriate bone graft
- Reproducible technique (size, preparation, position, screws, sutures, soft tissues)

Pre shaped Pre drilled Allograft “Glenojet”

Accurate Placement of screws and anatomic articular surface

Capsular Repair
Recreating the “sling”

Muscle split

Subscap

CB

What about the Hill Sachs?
Do not ignore when >20-30%
**Remplissage**

- Anatomical and functional results after arthroscopic Hill-Sachs remplissage.
- Loss of some ER but ‘healed’
- Boileau P, et al J Bone Joint Surg Am. 2012 Apr 4;94(7);
- But does it really heal, what size?
- Little benefit in 15% defects. Prevents engagement in 30% defects but significant loss of motion, Increased stiffness
- Elkinson et al JBJS June 2012
- To regain range soft tissue is disrupted
- Soft tissue operation for a bony problem- have we not learned our lesson !??

**Anatomic Reconstruction Options (Fix the Pathology)**

- Matched Allograft
- Autogenous Iliac crest Autograft
- Focal Resurfacing Option
- Both studies with reported 0% redislocation
- Preservation of motion!!
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Hill Sachs Defect

20 pts – Minimum 2 year follow up
All had Hill Sachs with Hemicap
9 combined with Latarjet/allograft
9 with isolated Glenoid
0 repeat dislocations/instability
Improved QOL

Humeral Head and Glenoid Bone Defects – Summary

- Significant cause of failures of instability surgery
- Need to recognize presence of defects and size
- In isolation- Glenoid >20%, humeral >30%
- Combined smaller lesions!!
- FIX the Pathology- Anatomically!!

THANK YOU

Anthony Miniaci M.D. FRCSC
Professor of Surgery
Cleveland Clinic