REVISION STABILIZATION OF THE SHOULDER
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Disclosures
- Consultant:
  - Arthrex, Zimmer, Depuy-Synthes, Depuy-Mitek, Shoulder Options, Inc.
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Goals
- Understand the 3 most common causes of failure following instability surgery
- Treatment options for osseous deficiencies
- Treatment options for capsulolabral deficiencies
Treatment Pitfalls

- Errors in diagnosis
- Errors in surgical technique
- Errors in rehabilitation

Errors in Diagnosis

- Capsulolabral
  - Multidirectional Instability
  - Posterior Instability
  - Clinical Dx
- Osseous
  - Glenoid Deficiencies
  - Humeral Deficiencies
  - Radiographic Dx

Costuroso JG, OKU Shoulder Elbow 3, 2008
Circle Concept

- Posterior instability in absence of posterior labral injury
- “Circle Concept” – dislocation in one direction requires capsular damage both on the same side and on the opposite side of the shoulder joint. *Warren*

Recurrent Capsulolabral Defects

- Most can be treated arthroscopically
  - Recurrent labral tear
  - Associated MDI
  - Associated capsular laxity or labral abnormality not addressed during index procedure
- Small symptomatic bone deficiencies
  - Minimal glenoid bone loss (Bony Bankart)
  - Hill-Sachs <20%: remplissage
  - Minimal glenoid version abnormalities (<15°)

Systematic Review

Revision Arthroscopic Bankart Repair

Jihad Alexander Karim Aboal, M.D., Katerina Barzantni, M.B.B.S., Richard Holby, M.D., Christian Velletre, M.B., and John Theodoropoulos, M.D.

- Meta-analysis (16 studies, 349 patients, f/u 35 mos)
- Majority level-IV studies (15/16)
- 12.7% recurrence after revision surgery
- 85% return to sports
- Risk factors:
  - bone loss, hyperlaxity, contact sports

Retrospective review (63 patients, f/u 47 mos)

- 19% recurrence after revision surgery
- 4 surgeons
- Risk factors:
  - hyperlaxity, number of prior surgeries

Errors in Diagnosis

- Osseous
  - Glenoid Deficiencies
  - Humeral Deficiencies
  - *Radiographic Dx*
    - Plain Xrays
    - CT arthrography!
**Glenoid Bone Deficiency**

- Rare
  - Morrey and Janes 1976
    - Glenoid bone loss accounted for less than 2%
- Relevant in revision surgery
- Easily missed
- Difficult to quantify on XR, MRI, or arthroscopically: **CT-arthrogram**


**Glenoid Bone Deficiency**

- Rowe 1961
  - Up to 30% loss OK
- Burkhart 2002
  - ‘inverted pear’
- Gerber 2002

  If L > R, force for dislocation reduced 70%


**Glenoid or Humeral Bone Deficiency**

**Burkhart and DeBeer 2002**

- 194 consecutive arthroscopic Bankart repairs
- 173 without bone defects, recurrence rate 4%
- In those with significant bone defects, they found a recurrence rate of 67%!
  - Inverted pear glenoid
  - Engaging Hill-Sachs lesion
- Contact athletes: 89% recurrence rate if bone defects

Surgical Options: Glenoid Deficiency

- Fix Fragment
- Coracoid process transfer (Latarjet)
- Iliac Crest Bone Graft

Arthroscopic Repair

Supayo et al., JBJS 87:1752-60, 2005.

21yo Football Player
Latarjet (1958)

- Reconstructs glenoid depth and width
- Static and dynamic restraint to anterior translation of humerus
- Non-anatomic reconstruction

Latarjet: Coracoid Harvest

- Subscapularis Transverse Split inferior 1/3 to expose glenoid

Latarjet: Fixation to Glenoid

- Fixation: 4.5mm malleolar screws
11/16/2015

32yo male s/p 2 failed prior arthroscopic Bankart repairs...

Latarjet – Results

- Recurrence rates vary from 0% to 6%
- Mean ER loss varies from 6 to 23 degrees
- Unclear role in progression of arthritis
  - ? Initial dislocation/trauma
  - ? Recurrent subluxation after stabilization
  - ? Iatrogenic

Glenoid Reconstruction with ICBG

- Anatomic restoration of bone loss
- Does not distort anatomy
- Graft site morbidity

Warner et al., AJSM 34:205-12, 2006.
**Humeral Head Deficiency**
- Fortunately rare
- Hill-Sachs most common
- <20% articular surface: arthroscopic remplissage
- >20% articular surface: fresh-frozen allograft

*Wolf EM et al., Arthroscopy 24:723-26, 2008.*

**Capsular Deficiency**
- After thermal capsulorraphy (capsular necrosis)
- Failed open capsular shift
- Congenital collagen disorders (Ehlers-Danlos)
- No definitive way to diagnose preoperatively – clinical suspicion and arthroscopy

**Capsular Deficiency Graft Options**
- **Hamstring autograft**
- **Iliotibial band autograft**
  - Gallie 1948, Tannotif 2002
- **Achilles allograft**
  - Moeckel 1993
- **Tibialis anterior allograft**
  - Braun and Millett, TSES, 2008
Capsular Deficiency – Hamstrings

Warner et al. JBJS

Capsular Deficiency – TA Allograft

Postoperative Result
Errors in Surgical Technique

- Poor mobilization of capsule
  - Anterior viewing portal
  - Releases with elevator, radiofrequency device
- Poor visualization of inferior glenoid
  - 70-degree arthroscope
  - Consider TCP for posterior visualization
- Poor or inadequate anchor placement
  - At margin, not 'on face'
  - 3 anchors*
- Inadequate "shift" of capsulolabral complex, esp. the IGHL

*Boileau et al., JBJB 88:1755-63, 2006.

Rehabilitation

- Phase 1: Protection (week 0-6)
  - Brace 5-6 weeks.
  - AAROM at 4 weeks
  - No passive ER>45° or elevation >90°
- Phase 2: Intermediate (week 6-12)
  - Unrestricted Active/Passive ROM
  - Periscapular strengthening
- Phase 3: Dynamic (week 13-20)
  - RTC strengthening
- Phase 4: Return to Sport (>week 20)

Conclusions

- The clinical examination is most important in guiding successful treatment of instability
- CT arthrography should be used to properly assess bony defects and the capsule prior to revision surgery.
- Although most recurrent capsulolabral deficiencies can be addressed arthroscopically, open methods remain the treatment of choice for large bony defects or capsular deficiency.