1  **Anterior Shoulder Instability**
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2  **Disclosures:**  
Spero G. Karas, MD  
- **Institutional Support:** DJO, Ossur, Arthrex, Conmed, Smith-Nephew, Mitek  
- **Consultant:** DJO, Arthrex, Conmed  
- **Royalties:** DJO

3  **Anatomy**  
- Labral complex  
  • “Bumper”- deepens glenoid  
  • Attachment of glenohumeral ligaments

4  **Anatomy**  
- Glenohumeral ligaments  
  • SGHL- Rotator interval  
  • MGHL  
  • IGHL  
  • Ant and post bands  
  • Axillary pouch

5  **Anatomy**  
- Rotator Interval  
  • SGHL  
  • CHL  
  • Biceps
6 **Mechanism of Injury**
- FOOSH
- AbER injury
- Direct Trauma

7 **Diagnosis - History**
- Subluxation vs Dislocation
  - ER reduction
  - “Popped it in myself”
  - “Went in and out”

8 **Physical Exam**
- “Load and Shift”
  - Grade 1 - up face
  - Grade 2 - on rim
  - Grade 3 - over rim

9 **Apprehension - Relocation**
- AbER reproduces symptoms
- Posterior directed force relieves symptoms

10 **Sulcus Sign**
- Inferior translation
- Interval lesion
  - Resolves in external rotation?

11 **Pathoanatomy**
- Bankart Lesion
  - Caps-labral complex off glenoid
  - Classic lesion
  - Traumatic Dislocators

12 **Pathoanatomy**
- Bony Bankart Lesion
  - Bankart lesion with anterior glenoid rim fracture

13 **Pathoanatomy**
- ALPSA lesion
• Healed Bankart
• Tension off GH ligaments
• Release and repair anatomically

14 Interval Lesion
• Tear/deficiency of interval capsule
• Restraint to inferior translation
• Sulcus sign

15 HAGL Lesion
• Humeral Avulsion of Glenohumeral Ligaments
• ≈10% of patients
• Pre-op MRI
• Usually open Repair
• Recently Arthroscopic
  Karas, Spang Arthroscopy 2005

16 GLAD Lesion
• Glenolabral Articular Disruption
• Superficial anterior-inferior labral tear
• Associated with anterior-inferior articular cartilage injury

17 Hill Sachs Lesion
• Posterior Humeral Head Defect
• Increased Dislocation Rate
• “Remplissage”
  • Fills defect with infraspinatus

18 Imaging
• Plain Film
  • Orthogonal views
  • Bony Bankart
  • Hill Sachs lesion

19 Imaging
• MRI
  • Capsular anatomy
  • Bankart v HAGL
• Glenoid insufficiency (CT better)
• Interval lesion
• SLAP
• Arthrogram improves technique

20 Principles of Management

1. Recurrence Rates
   • Skeletally immature: near 100%
   • <22: 50-85%
   • 23-40: 25-50%
   • >40: low

2. Sling Management
   • External rotation?
   • Strengthening program
   • Bracing?

21 Non-Op Management

1. Indications
   • Age? Sport? Hill Sachs?
   • In season / pre-season athlete
     • Full ROM and Strength
     • Brace (If not a thrower)
   • Recurrence:
     1.4/athlete/season
     Buss, AJSM, 2004

22 Immobilization:
   Itoi, JSES, 2003

• External Rotation Immobilization
  • F/U 15 mos
  • Recurrence
  • IR- 30%
  • ER- 0
  • Recent information not a favorable…
  • Probably does work better than internal rotation
(Hovelius 1996; Kiviluoto, 1980)

23 Does Arthroscopy Reduce Recurrence?

24

25 Does Arthroscopy Reduce Recurrence?
Evidence Based Answer:
Nonoperative Treatment Has a Higher Recurrence Rate than Arthroscopic Repair

• 131 Primary Dislocators: 5 yr f/u
  • 88 stable
  • 43 unstable
    • 39/43 < 40yo
    • 37/39 contact or overhead
  • 102- No surgery
  • High Risk: young, overhead, contact sports
    • 65% “copers” despite lower outcomes scores
  • “Difficult to justify” in the acute setting

27 Kirkley, et al, JARS, 2005
• 79 month Follow Up
  • Redislocation rate plateaus at 2 years
  • WOSI, DASH, and ASES scores “equalize”
• “Wait and See Approach” in all but the most high risk athletes (kayak, climbing, parachutists)

28 Summary Statement…
1 • Reserve acute stabilization for most “at risk” patients
  • Contact athletes especially young or skeletally immature
  • Much to lose (professional or collegiate careers
  • “At Risk” Avocations/Vocations

2 • Most patients can likely wait to stratify into “recurrent group”
Many will not require surgery

- Low risk of “waiting”
  - Injuries do not progress as time/recurrences increase
    (Cameron, AJSM, 2003)

What About Contact Athletes?
*Do the Level I “rules” apply?*

**How should we approach instability in the contact athlete?**

- Answer: We Don’t Know!
- Best available evidence: Equal rates of recurrence regardless of technique
- Data is Poor (Level 3 and Level 4)
- Need Better Studies
- Do what works best in your hands

**Surgical Management**

- Can arthroscopic instability procedures reproduce open results?
- Yes:
  - Caspari, Savoie, Romeo, Gartsmann
- No:
  - Guanche, Walch

**Keys to Arthroscopic Reconstruction**

- Diagnosis
  - Hill Sachs, HAGL, Glenoid Insufficiency
- Address labral injury
- Treat capsular redundancy
  - Plication/Shift
  - ETAC
- Interval Closure?
- Rehabilitation
Can Arthroscopy Address Capsular Laxity?

Karas, Creighton, Demorat: JARS 2003

- Arthroscopic Shift
  - Suture Plication- 19%
  - ETAC- 33%
  - Plication + ETAC- 41%
- Used only four tucks and no interval closure

Surgical Technique

Interval Closure

Karas, JARS, 2002

Bone Loss in Instability: The “Off-Track” Lesion

- 83% of “best fit” circle minus glenoid deficiency= D
  - If HSL > D, lesion “off track”
  - Requires management of glenoid deficiency, Hill Sachs deficiency, or both

Open Reconstruction

- Glenoid deficiency
  - Bone Graft
  - Laterjet
- Multiple dislocations
- Large HSL
- Laxity ↑↑

A final word about open reconstruction...

- Mohtadi, N JBJS 2014
• Randomized prospective trial
• Level I Evidence
• No differences:
  • WOSI
  • ASES
• Differences in Recurrence
  • Open- 11%
  • Arthroscopic- 23%

Conclusions
1 • Common Injury
   • Contact Athletes
   • High Recurrence Rates
• Non-operative Rx:
  • Older patients
  • Sport dependent
  • In-season athletes

2 • Surgery Decreases Recurrence Rates
• Open Surgery
  • Multiple Recurrences
  • Large Hill Sachs
  • Glenoid Bone Deficiency