First-Time Anterior Shoulder Dislocation: Is it time to take a stand?

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Disclosures

I (and/or my co-authors) have something to disclose.

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“My Academy” app;

Printed Final Program; or

AAOS Orthopaedic Disclosure Program on the AAOS website at [http://www.aaos.org/disclosure](http://www.aaos.org/disclosure)
What Treatments are available for Initial Dislocation?

- Immobilization in IR
- Immobilization in ER
- Early ROM, rehab, and return to sport
- Arthroscopic lavage
- Acute arthroscopic stabilization
- Acute open Bankert
How do we measure results of treatment for Acute Dislocation in 2018?

- Recurrent instability: *inadequate*
- Return to *unrestricted activity*
- Outcomes measure:
  - Rowe score
  - Simple Shoulder Test
  - SANE score
  - Western Ontario Shoulder Instability Score**
## Natural History: Recurrence Rates

<table>
<thead>
<tr>
<th>Study</th>
<th>Age Group</th>
<th>Recurrence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rowe</td>
<td>&lt; 20 yo</td>
<td>94%</td>
</tr>
<tr>
<td>McLaughlin</td>
<td>&lt; 20 yo</td>
<td>95%</td>
</tr>
<tr>
<td>Henry, Genung 1982</td>
<td>17-23 yo</td>
<td>90%</td>
</tr>
<tr>
<td>Simonet, Cofield 1984</td>
<td>athletes &lt; 30 yo</td>
<td>82%</td>
</tr>
<tr>
<td>West Point</td>
<td>17-24 yo</td>
<td>85%</td>
</tr>
<tr>
<td>Marans 1992</td>
<td>Open physes</td>
<td>100%</td>
</tr>
<tr>
<td>Postacchini 2000</td>
<td>adolescents</td>
<td>92%</td>
</tr>
</tbody>
</table>
25 year F/U primary dislocation
Hovelius et al JBJS May 2008

255 patients, included age to 40

At risk group:

- Age 12-22, no fracture
- 44% required surgery
- Contact/recreational sports:
- 70% recurrent instability or surgery
Increased Recurrence in Collision Athletes

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<td>Wheeler 1989</td>
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<td>Arciero 1994</td>
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Natural History of Primary Dislocation at West Point

- 4,100 cadets
- Required: military/combative training obstacle course
- 117 instability events/year
- 12-15 primary dislocations each year

Owens et al AJSM 2007
Pathology Primary Anterior Shoulder Dislocation

63 patients
61 had a Bankart lesion
6 had Type II SLAP
1 capsular tear; 1 HAGL
22% rim avulsion

Taylor, Arciero et al AJSM 1997
Pathology Acute Dislocation

there is stretch of the IGHL

Bigliani et al J Ortho Res 1992
Ticker, Bigliani et al JSES 1996

McMahon, Lee TQ (JSES ‘98; ‘01)
IGHL deformation after Bankart: 0.8mm
Anatomic Repair of Bankart lesion may be sufficient

Optimum conditions for arthroscopic repair!!
Acute Operative Repair

3 studies:
- reversed natural Hx.
- Non-op Rx: 92% recurrence
- Operative: 14% @ 13 year F/U
- WOSI @ 13 yrs: 85% normal

Wheeler, Ryan, Arciero, Arthro 1989
Arciero et al AJSM 1994
Owens et al AJSM 2007
Initial Anterior Shoulder Dislocation PRCT 10 year follow-up

Nonoperative
- 39 pts
- 24 recurred
- 19 needed surgery
- 15 no recurrence
- 5 w problems
- 75% unsatis result

Operative
- 36 open repair
- 2 recurred
- 1 revision repair
- 4 pain
- 85% excellent/good

Jakobsen et al Arthroscopy 07
Initial Anterior Shoulder Dislocation
PRCT 10 year follow-up

Nonoperative
- 39 pts
- 24 recurred
- 19 needed surgery
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Operative
- 36 open repair
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- 1 revision repair
- 4 pain
- 85% excellent/good

Nonoperative group requiring surgery:
Only 63% good/excellent

Jakobsen et al Arthroscopy 07
Systematic Review of Nonoperative vs. Operative Treatment for First-time Anterior Dislocation

- RCTs of Level I and II evidence
- Outcomes:
  - recurrence rates
  - Rowe score
  - WOSI

Godin, Sekiya Sports Health April 2010
Arliani et al Open Access Journal Sports 2011
Longo et al Arthroscopy 2013
Systematic Review of Nonoperative vs. Operative Treatment for First-time Anterior Dislocation

- RCTs of Level I and II evidence
- Outcomes:
  
  Available evidence supports operative stabilization for primary anterior shoulder dislocation in young active patients participating in highly demanding physical activities

Godin, Sekiya Sports Health April 2010

Arliani et al Open Access Journal Sports 2011

Longo et al Arthroscopy 2013
Management of Primary Acute Anterior Shoulder Dislocation: Systematic Review and Quantitative Synthesis of the Literature

Umile Giuseppe Longo, M.D., M.Sc., Ph.D., Mattia Loppini, M.D., Giacomo Rizzello, M.D., Mauro Ciuffreda, M.D., Nicola Maffulli, M.D., M.S., Ph.D, Vincenzo Denaro, M.D.

- 2,813 shoulders
- Cochrane methodology
- 31 studies:
  “the available RCTs supports primary surgical stabilization in young patients involved in demanding athletic and job activities”
Hovelius JSES May/June 09: 25 year radiographic follow-up

Arthropathy after primary dislocation:

- 40% if recurred more than 1x
- 18% if no recurrence
Hovelius JSES May/June 09: 25 year radiographic follow-up

Arthropathy after primary dislocation:

- 40% if recurred more than 1x
- 18% if no recurrence

"Shoulders without recurrence had less arthropathy than those with recurrence or who stabilized over time"
Bone loss in G-H Instability

- Significant bone defects are rare in 1st dislocation
- Bone defects change options for surgery
- Arthroscopic repair alone: high recurrence rates
Bipolar Bone Loss in Patients With Anterior Shoulder Dislocation: A Comparison of Adolescents Versus Adult Patients

Brian C. Lau, M.D., Devin Conway, B.S., Patrick F. Curran, M.D., Brian T. Feeley, M.D., and Nirav K. Pandya, M.D.

Main finding of Dr. Feeley’s group

• Adolescence and a history of multiple anterior dislocations of the shoulder are independent risk factors for a much greater likelihood of off-track Hill-Sachs lesions
Adolescents (age 10-19) plus Multiple Dislocations

**Implications**

- Better to do arthroscopic Bankart repair after first dislocation while H-S is on-track

- If wait until after second dislocation to operate (when H-S is likely to be off-track), then more extensive surgery will be necessary (arthroscopic Bankart repair plus remplissage)
Re-defining “Critical” Bone Loss

- 72 arthroscopic repairs
- 4 quartiles of bone loss:
  - **13.5%** glenoid bone loss
    - Worse outcomes: WOSI, SANE
    - Considered “failures”
  - Increased recurrence not observed until bone loss 20%

Shaha, Bottoni, Tokish et al AJSM 2015
Surgery for 1st time dislocators vs. recurrent

- prospective, multicenter
- Moon Shoulder Group
- 172 patients; Avg age 25
- ** preop imaging showed more bone loss in recurrent instability
- ** initial dislocations had arthroscopic repair
- Recurrent instability: more likely to require bony procedure

Rugg et al JSES 2018
“Let them have another dislocation”

- Articular surface lesions
  - Glenoid, Humeral Head
- Bone defects
- Repetitive subfailure strains
  - Capsular and ligament elongation
  - Additional laxity induced with recurrence

Pollack et al, JSES 2000; Urayama, Itoi AJSM 2003
Buscayret, Szabo, Walch, et al AJSM 2004
Habermayer JSES 1999
Argument #2: If recurrence rates are 70%, then 30% will have unnecessary surgery?

- If only consider dislocation
- ?? Subluxation
- Assumes all patients without recurrent dislocation have excellent result
- ? Quality of life, return to sport
- ....Overall results may be much worse
Since leaving the military...

- More convinced this is the right approach:
- Others reproducing this result
- Best "outcome"
- Recurrent dislocation not benign
- 1st dislocation:
  - Optimum case for arthroscopic repair

Bottoni et al. AJSM 2002
Kirkley et al. AJSM 1999
Robinson et al. JBJS 2008
Technique
Acute Bankart Repair: ‘Golden Opportunity’

Restore Anatomy & Function
Predictable, Improved Outcome
Case example: 21 yo college football player

- 1st dislocation in pre-season
- treated with rehab/brace
- returns in 7 days
- no apprehension
MRI
- plays 5 games
- 3 subluxation events
- rapid return
- 6th game: major subluxation episode
2nd MRI
arthroscopy

- after 1st event:
- Bankart lesion
- now with 300 degree labral tear
- 6 double loaded anchors
Dilemma:

- athlete returning to sport
  vs
- intermediate consequences: bone loss, labral wear, articular cartilage wear
- change the surgical procedure
- long term consequences
Thank you

New England Musculoskeletal Institute
In-season dislocation

- collision athletes
- contact athletes
- overhead athletes
Immobilization in ER vs. IR

Meta-analysis of RCT:
- no difference
- no difference in WOSI
- no difference in QAL scores
- compliance with brace wear

Whelan et al AJSM 2015
Itoi, JBJS 2001
Rehabilitation, early return

- favored by elite athletes
- FROM
- cuff rehabilitation
- plyometrics
- “brace”
?? Brace

- limits ER
- collision sports
- impractical for “skill” players
- recent study: “Dynamic Brace” may be effective

Conti et al Musculoskeletal Surg 2017
Dr.: What are the chances I can play?

- 26/30 (87%) athletes completed the season
- high school and collegiate athletes
- 10 days to return
- 37% had recurrence during season
- 54% had surgical stabilization

Buss et al AJSM 2004
Dr.: What are the chances I can play?

- prospective study 45 collegiate athletes
- 73% returned; 5 days to return
- **ONLY** 27% had no recurrence
- 33% could not complete season
- 64% had multiple recurrences

Dickens et al AJSM 2014
Dr.: Should I get my shoulder fixed at the end of the season?

- 39 athletes treated non operatively after 1st dislocation
- 10 chose nonoperative management
- only 4 return to play next season with no recurrence
- 29 who had surgery: 90% no recurrence
- Surgery: 6x greater completion of season without recurrence
The “cost” of recurrent instability:

- Articular surface lesions
  - Glenoid, Humeral Head
- Bone defects
- Repetitive subfailure strains
  - Capsular and ligament elongation
  - Additional laxity induced with recurrence

Habermeyer et al, JSES 1999
Pollack et al, JSES 2000; Urayama, Itoi AJSM 2003
Buscayret, Szabo, Walch, et al AJSM 2004
Sub-critical bone loss of 13.5% and recurrence after arthroscopic stabilization

- 50 collegiate football players
- no recurrence if <13.5%

> preoperative instability episodes:
  - more extensive labral lesions
  - more anchors required

Dickens et al AJSM 2017
Arthroscopic Primary Repair
Standard has changed:
active, athletic patients< 25 years old

- Natural history
- Pathoanatomy: optimum
- Improved outcomes w repair
- Surgery for recurrent dislocation:
  - results not as good as primary
  - Bone loss: changes treatment
  - arthropathy
Dilemma:

- athlete returning to sport vs.
- intermediate consequences: bone loss, labral wear, articular cartilage wear
- change the surgical procedure
- long term consequences