The Arthroscopic West Point Technique: An Arthroscopic Load Shift for Assessing a Balanced Shoulder

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Introduction

- Shoulder stabilizations are one of top 3 procedures in MHS- 6110/yr
  - Mauntel et al SOMOS 2017
- Combined labral pathology is common and arthroscopic recognition and treatment of associated pathology is important for a successful arthroscopic stabilization
  - Dickens et al AJSM. 2017
- Several special tests used to by clinicians for evaluation of shoulder instability
  - Load Shift Test (Sillman, Hawkins 1993)
    - A grade 0 load shift is defined as normal translation. Grade 1 is excessive translation with no subluxation, while grade 2 is subluxation to, but not over the glenoid rim. Grade 3 represents dislocation of the humeral head beyond the glenoid rim.
- There are no described DYNAMIC arthroscopic techniques to assess the degree of relative stabilization, direction of instability, and presence of associated/combined capsulolabral lesions
We propose an arthroscopic modification of the load shift examination, that allows for dynamic evaluation of shoulder instability and stabilization to assess the direction and degree of instability, titration of capsular and labral repair, and post-stabilization glenohumeral translation.

This Arthroscopic West Point technique involves employment of previously described Load Shift exam in concert with direct visualization of humeral head on glenoid via the establishment of an intra-articular “50-yard line view” from and Anterior-Superior portal.

Our goal is to describe reproducible intraoperative technique for surgeons to assess not only anterior and posterior pathology but also capsulolabral tension.
Case Example

31 yo M AD USN

- CC: R Shoulder pain, clicking
  - No traumatic event
  - Apprehension with pressing motions, overhead, throwing
  - Cumulative effect weightlifting/military training

- Right shoulder exam
  - NO muscle atrophy, no TTP
  - + ant apprehension/relocation;
  - **Grade 2 Anterior Load shift, Grade 2 Posterior load shift**
  - significant guarding with post / ant load-shift; neg sulcus; pain jerk / Kim tests; RC strength 5/5 all planes

- Plain Films: NO osseous abnormality
- MRI: Anterior and Posterior labral tear,
Positioning and Portal Location

- Beach Chair or Lateral decubitus positioning
- Post/Anterior-Inferior portals
- Diagnostic arthroscopy

- Anterior-Superior portal (ASP)
  - Establishment of “50-Yard line view”

Figure 1: Right shoulder, Anterior-Superior portal highlighted
Figure 2: Anterior-Superior Portal (ASP) localization
50-yard line West Point View

Figure 3: Right shoulder “50-yard line view” - ASP
**Intraoperative Load Shift**

- Arthroscope held in Anterior-Superior portal (ASP)
- Elevation of humerus 30-50° of abduction
- Anterior and posterior directed forces are placed -proximal humerus/humeral head relative to glenoid (prior to stabilization)
- Recording and evaluation of anterior/inferior and posterior injury and instability
- Allows for anchor position planning

**Figure 4** (above) anterior directed force. **Figure 5** (below) posterior directed force
Both images viewing from ASP.
Figure 5: R Shoulder, “50-yard line view”

Figure 7: Anterior-Superior portal, anterior directed shift force

Figure 8: Posterior portal, Anterior labral tear

Figure 9: Posterior portal, P/A labral tears
During Stabilization
- Arthroscopic stabilization performed
- Incremental assessment of joint balance with titration of tensioning and anchor position

Post Stabilization
The same positioning and forces applied as pre-stabilization load shift are applied on humeral head during and after stabilization.
Right Shoulder
50-yard Line View

Posterior Shift

50 yard line

Anterior Shift
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<tr>
<th>Pearls</th>
<th>Pitfalls</th>
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<tr>
<td>Hydraulic arm holder facilitates positioning the arm in various amounts of abduction to adequately assess stability in all planes of motion</td>
<td>Lateral decubitus positioning is more difficult and requires a surgical assistant and removal from the arm positioner</td>
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<td>Testing the arm at extremes of motion can assess for engagement of any existing Hill Sachs lesion in real time</td>
<td>Incorrect portal placement may limit the ability to completely visualize the glenoid rim</td>
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<td>Beach chair positioning increases the ease</td>
<td>Outflow can potentially be impaired when viewing from the anterior superior portal</td>
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Pre (left) and Post(right) stabilization posterior load shift shown below
Utilizing The West Point View *before, during, and following* anchor placement for shoulder instability will assist the surgeon in:

(1) Identifying grade and direction of instability

(2) Accurately recognize capsulolabral defect(s) at corresponding exam endpoints. In depth injury characterization

(3) Dynamically gauge capsulolabral tensioning during and after anchor placement.

We describe a simple reproducible technique to aid in better restoration of glenohumeral balance and stability.


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