

Identification and Treatment of Existing Copathology in Anterior Shoulder Instability Repair



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Abstract: Recurrent anterior instability is a common finding after traumatic glenohumeral dislocation in the young, athletic patient population. A variety of concomitant pathologies may be present in addition to the classic Bankart lesion, including glenoid bone loss; humeral head bone loss; rotator interval pathology; complex/large capsular injuries including humeral avulsions of the glenohumeral ligaments (HAGL lesions), SLAP tears, near circumferential labral tears, and anterior labral periosteal sleeve avulsions (ALPSA lesions); and rotator cuff tears. Normal anatomic variations masquerading as pathology also may be present. Recognition and treatment of these associated pathologies are necessary to improve function and symptoms of pain and to confer anterior shoulder stability. This review will focus on the history, physical examination findings, imaging findings, and recommended treatment options for common sources of copathology in anterior shoulder instability repair.

In a young active population, instability is the most common shoulder affliction. Patients can have a variety of pathologies concomitant with or in lieu of a traditional Bankart lesion. If all pathology is not recognized or treated appropriately, the patients' shoulder instability, pain, and diminished function may persist. Treating patients with multiple foci of pathology thus represents a diagnostic and therapeutic dilemma. The objective of this report is to facilitate the recognition and treatment of several types of potentially confounding concomitant shoulder pathologies in otherwise active patients with instability.

Recurrent anterior instability is a common finding after traumatic glenohumeral dislocation in the active population.¹⁻⁵ The basis for treatment of shoulder instability begins with a thorough preoperative history and physical examination, followed by careful evaluation, interpretation, and clinical correlation of imaging studies. Once the etiologic factors contributing to instability are identified, it is imperative to determine the presence or absence of copathologies. This is especially important preoperatively (to plan for specific repair strategies) and intraoperatively to prevent otherwise avoidable postoperative complications.⁶

Surgical intervention is of course guided by the underlying pathology. However, patient demographic characteristics, activity level, and expectations must also be taken into consideration. For instance, throwers and overhead workers subject the rotator cuff, superior glenoid, and subacromial soft tissues to repeated strains. These patients often present with multiple foci of chronic, cumulative pathology,⁷⁻⁹ whereas contact athletes may subject the anteroinferior labrum, capsule, and glenoid to repeated trauma, placing them at higher risk of recurrent instability after surgery.

A variety of concomitant pathology may be present in addition to the classic Bankart lesion, including glenoid bone loss; humeral head bone loss; rotator interval pathology; complex/large capsular injuries including humeral avulsions of the glenohumeral ligaments (HAGL lesions), SLAP tears, near circumferential labral

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tears, and anterior labral periosteal sleeve avulsions (ALPSA lesions); and rotator cuff tears (RCTs). Normal anatomic variations masquerading as pathology also may be present. Recognition and treatment of these associated pathologies are necessary to improve function and symptoms of pain and to confer anterior shoulder stability.

History

When a patient presents to the clinic after an anterior shoulder dislocation or subluxation event, the history and examination need to be closely scrutinized. It is important, first and foremost, to ensure that the correct diagnosis is made. Patients with recurrent anterior instability typically complain of instability during the midranges of motion (especially if associated with glenoid and/or humeral head bone loss), pain with the arm in the provocative position of abduction and external rotation, and an increasingly progressive ease of instability events. In contrast, the most frequent complaint in patients with primary multidirectional instability (MDI) is generalized or deep posterior shoulder pain, which is often accompanied by decreased athletic performance, as well as loss of strength.¹⁰⁻¹³ Activities commonly associated with MDI include overhead throwing, tennis, butterfly and freestyle swimming, weight lifting, and football in a lineman position. Primary MDI is suspected in a young patient with multiple nonspecific complaints of activity-related shoulder pain, weakness, or paresthesias rather than symptoms of instability. Finally, symptoms in patients with primary posterior instability occur or intensify with the arm in the provocative position of forward flexion, adduction, and internal rotation. In throwers, symptoms typically occur during follow-through, whereas in swimmers, symptoms typically occur during the pull-through phase.

For all patients, the clinician should ask about generalized ligamentous laxity, history of instability events, mechanisms of injury, prior treatment, and overall activity goals and expectations. These historical facts are pertinent to determining the eventual surgical stabilization plan and can be extremely helpful in evaluating for other pathologies coexisting with the capsulolabral disruptions associated with instability.

Physical Examination

On examination, both shoulders should be evaluated, with observation of any obvious asymmetry, abnormal motion, muscle atrophy, swelling, scapular winging, and tracking. The asymptomatic shoulder may be examined first to gain patient confidence and relaxation.¹⁴⁻¹⁶ Wide scars may suggest a collagen disorder.¹⁷ Scapulothoracic dyskinesia should be carefully evaluated.¹⁸⁻²⁰ A shoulder examination to document instability is performed in the office and should be confirmed by an examination under anesthesia.²¹

In posterior instability,²² the location of pain may be variable and occur along the posterior joint line,^{19,23} biceps tendon, or the superior aspect of the rotator cuff. Subjective apprehension in posterior instability is uncommon.¹³ The posterior apprehension or stress test may reproduce symptoms.^{19,23,24} Range-of-motion testing in patients with posterior instability usually yields normal and symmetrical findings,^{19,25,26} although an increase in external rotation and mild loss of internal rotation may be observed. Additional posterior instability tests include the jerk test,^{27,28} the posterior stress test,²⁹ the Kim test,³⁰ and the load-and-shift test.¹⁵ It is important to note that patients with a painful jerk test have shown a higher failure rate with nonoperative treatment.³⁰ Combining the Kim and jerk tests has been shown to have 97% sensitivity for posterior instability.³⁰ Neurologic and vascular symptoms are generally absent in posterior instability.

MDI is associated with apprehension during range of motion,¹⁷ and patients have tenderness along the medial angle of the scapula and anterior rotator cuff. Internal rotation strength is decreased up to 30% in MDI²⁰ and serves to emphasize the dynamic muscular dysfunction in this condition. Anterior impingement may also be present in failed MDI repair cases because of increased excursion of the humeral head into the cuff tendons. Moreover, recurrent MDI may present with multiple nonspecific shoulder complaints of pain, paresthesias, and problems while carrying a weight at the side.^{31,32} Subluxation events during sleep may be common. Excessive inferior translation of the humerus on the glenoid is often associated with posterior subluxation^{10,23,33} and may indicate bidirectional instability or MDI if the inferior sulcus test reproduces the patient's symptoms. MDI should have a clearly symptomatic sulcus component (Fig 1).³²⁻³⁵ This may be reproduced with the arm in 90° of abduction while applying a downward force on the proximal humerus to cause inferior displacement.³² Finally, generalized ligamentous laxity has been associated with glenohumeral instability and should be assessed in patients with recurrent instability.^{10,36} Generalized ligamentous laxity has been documented in 40% to 75% of patients who underwent surgery for MDI^{20,37} and has been associated with decreased surgical success rates.

Imaging Studies

For initial evaluation of the shoulder, a standard shoulder radiograph series (Fig 2) is the preferred modality. Several additional views that are helpful in evaluating bony causes of instability include the serendipity view, Grashey view, West Point axillary view, Stryker notch view, scapular Y view, Garth view (apical-oblique view), and Didiee view (Table 1).

Advanced imaging modalities with magnetic resonance imaging (MRI) and computed tomography are

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