

SLAP Lesions Classification Diagnosis Management

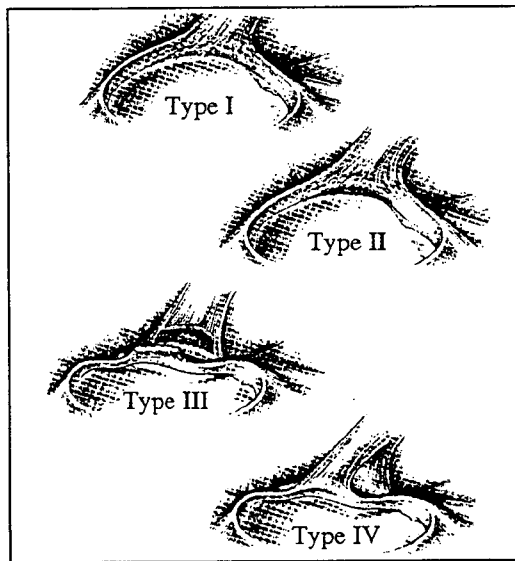
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Incidence

Snyder introduced the term "SLAP lesion" (Superior Labrum Anterior Posterior) for pathology involving the biceps tendon anchor to the labrum.¹ The lesion is rare, occurring in only 27 of 700 shoulder arthroscopy cases reported by Snyder and Karzel.

Anatomy

- 1) Labrum enlarges and deepens the socket.²
- 2) The blood supply is through small periosteal and capsular vessels. The vessels supply the outermost aspect of the labrum; the inner rim is without vessels similar to the knee meniscus.³
- 3) Ligament attachment
The IGHL attaches to the lower one-half of the labrum through the anterosuperior band, axillary pouch, and posterosuperior band. The MGHL attaches medially on the upper neck of the scapula with fibers extending to the upper half of the labrum. The SGHL blends with the biceps tendon.
- 4) Biceps tendon: The long head of the biceps tendon attaches predominantly through the posterosuperior portion of the labrum, with an extension to the anterosuperior labrum.
- 5) The labrum acts as a seal for the negative atmospheric pressure that contributes to joint stability. This helps the adhesion-coadhesion effect.^{4,5,6}



Superior labrum anatomical variations:

- Type I The superior labrum is detached centrally but attached peripherally.

Type II The superior labrum is attached centrally and peripherally.^{7,8}

Biceps(long head) labrum function

Contributes to anterior shoulder stability⁹

Increases torsional rigidity(in abduction-external rotation cocking position)

Decreases the stress on the IGHL

Absence of long head increases proximal humeral migration 16%¹⁰

Superior labral pathology

Decreases the torsional rigidity

Places a greater strain on the IGHL

Mechanism of injury

Acute

Fall onto an outstretched arm. Impact occurs with the shoulder in abduction and slight forward flexion.

Chronic

A continuum of injuries to the biceps tendon exist, from the rotator interval to the superior labrum detachment.¹¹ Paulos stated that you cannot appreciate the rotator interval lesion until open exploration of the bicipital groove and rotator cuff interval was performed. Fraying or flattening of the biceps tendon as it entered the sulcus and/or fraying of the subscapularis tendon were the subtle arthroscopic findings that directed attention to this area.

Clinical complaints

The most common clinical complaints were pain, greater with overhead activity, and a painful catching or popping in the shoulder.

Physical examination

The physical findings may be sparse. Palpate for tenderness at the biceps tendon or rotator interval. Biceps stress tests may be positive. Joint grinding may reproduce the symptoms.

Imaging

No imaging test accurately defined this lesion.

Diagnosis

Arthroscopy

Four types of SLAP lesion(@Snyder)

- Type I The superior labrum appears roughened and degenerative, with an intact labral edge and biceps tendon anchor.
- Type II The roughened superior labrum detaches from its insertion. With traction, this labrum along with its biceps tendon anchor arches away from the bone, rendering the biceps-labral complex unstable.
- Type III The superior labrum has a bucket handle tear, but with an intact biceps tendon and attached labrum rim.
- Type IV In addition to the bucket handle tear, there is a split tear of the biceps tendon, which is displaced with the labral flap into the joint.
- Complex Any combination of above.

Associated lesions

Associated lesions include rotator cuff tears, loose bodies, anterior dislocations chondromalacia, and biceps tendon tears.^{12 13}

Treatment of SLAP lesions

- Type I Debride, preserving the labrum and biceps tendon.
- Type II Debride and abrade done. Fix with a suture anchor or transglenoid technique.
- Type III Excise or repair the bucket handle.
- Type IV Excise/repair labrum; repair or tenodesis biceps tendon split.

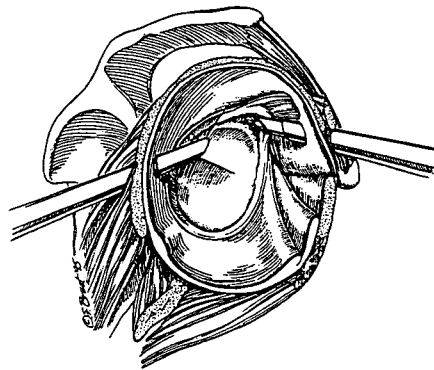
Surgical Technique for SLAP II Lesions¹⁴

See next page

Repair of Type II SLAP Lesion

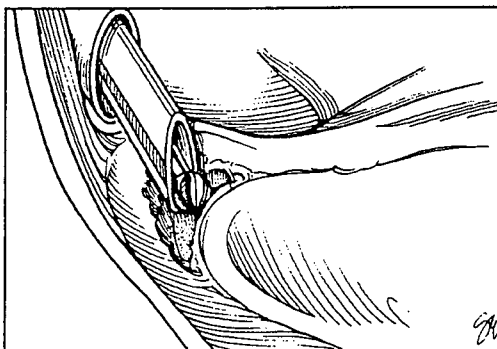
Type II SLAP Lesion

The roughened superior labrum detaches from its insertion. With traction, this labrum along with its biceps tendon anchor arches away from the bone, rendering the biceps-labral complex unstable.

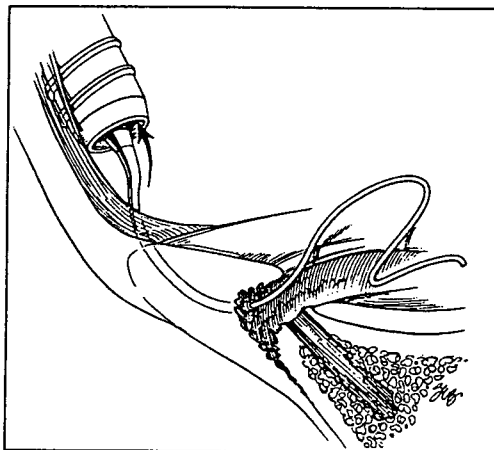
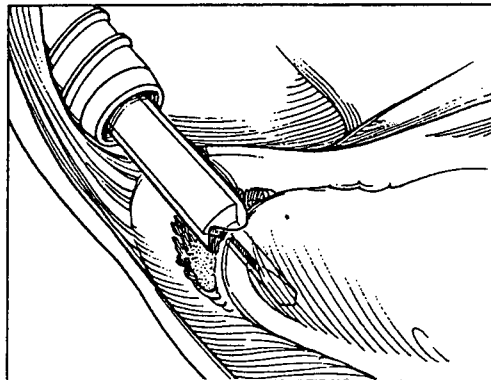


Arthroscopic Repair of a Type SLAP II Lesions¹⁵

1. Prepare the bony bed with a small ball burr.

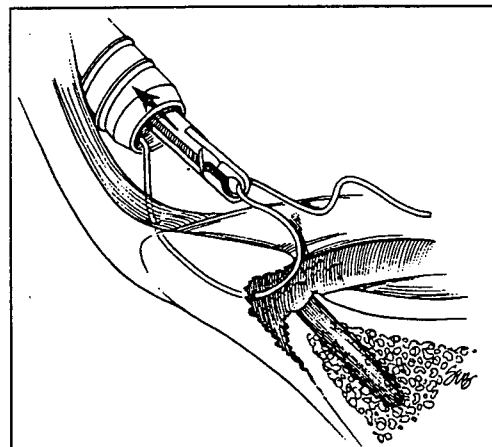


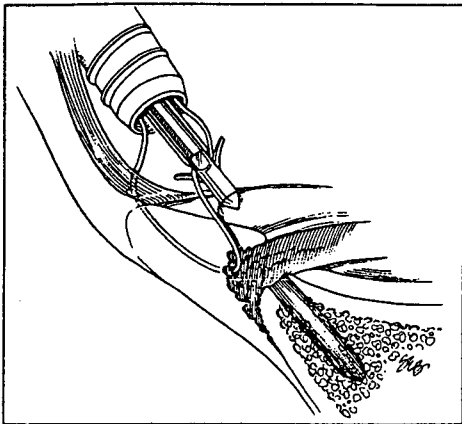
2. Drill or punch a hole at the cartilage bone junction of the superior labrum.



3. Pass a suture through the superior labrum at the biceps attachment with a suture hook from the anterior superior portal.

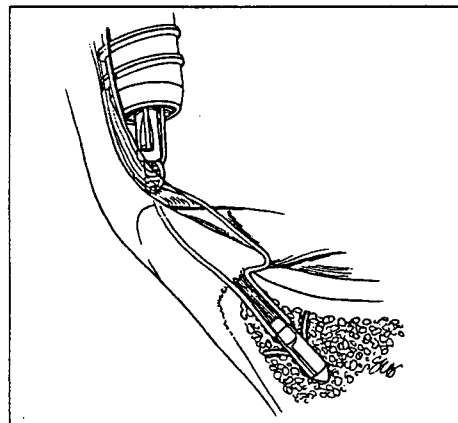
4. Grasp the "inside limb" of the suture with a suture retrieval forceps.





5. Set the anchor(Mitek GII) into the drill hole by mounting the suture anchor on the inserter and slide it down the "inside limb" of the suture. The inside limb is the end of the suture that came through the avulsed ligament surface.

6. Close the loop with a slipknot that is tied and tightened outside the cannula. Slide it down the canula tightening the loop and approximating the superior lbrum detachment to the superior glenoid. A Knot pusher snugs the knot under arthroscopic control.



7. Use a shoulder immobilizer(Don Joy Ultrasling). Begin pendulum exercises at three weeks. Initiate active and passive range of motion at six weeks using the bar and pulley of the Shoulder Therapy Kit(BREG, Vista CA). The shoulder should have full range of motion by twelve weeks post-operatively. Throwing besins at three months post-operatively, and overead activity by six months. Athletes should avoid contact and collision sports for one year.

Results of SLAP II Repair

Yonda reported 80% excellent or good results in 10 athletes with a Type II lesin fixed with an arthroscopic staple.¹⁶ One failure was due to residual subacromial

bursitis and the other to multidirectional instability. Four had complete healing and 6 had good stability but superficial healing was not complete.

Field and Savoie reported 16 excellent and 4 good results following arthroscopic suture repair of SLAP II and IV lesions to bone with an average follow up of 21 months.¹⁷ Their technique consisted of debridement of the frayed labrum, abrasion of the superior glenoid neck, and placement of multiple sutures into the torn labrum-biceps tendon complex using a transglenoid drill hold to the posterior aspect of the shoulder and tied over the infraspinatus fascia.

Resch treated 18 patients by arthroscopic internal fixation with a 2.7mm cannulated, self-tapping titanium screw with washer. Eight felt completely rehabilitated, 4 were improved, and two were not improved. Resch had another 4 patients who had not undergone reattachment but only shaving of the glenoid. Only one experienced improvement.

Surgical Treatment for Type IV

Choices

This depends on the severity of the biceps tendon involvement. The choices are:

1. Excise the labrum and biceps fragment. Assume the biceps remnant is adequate for function.
2. If biceps rupture seems imminent, perform a biceps tenodesis and excise the labrum-biceps fragments.
3. Repair the labrum biceps split using a suture hook, intraarticular knot tying, and a knot pusher.

Arthroscopic repair of Type IV SLAP lesion

First repair the split in the biceps tendon using a suture device (hook, hawkeye, punch, etc) from the anterior superior portal. Make a slip knot outside the cannula. Slide the knot down the cannula with a Knot pusher, closing the longitudinal split in the biceps tendon. Then, repair the labrum to the glenoid as outlined for the Type II repair technique. See Bankhart's case report of SLAP IV¹⁸

Summary

- 1) The superior labrum-biceps complex contributes to shoulder stability.
- 2) Injuries to the superior labrum
 - Decrease torsional rigidity
 - Place a greater strain on the IGHL
- 3) Arthroscopy enables diagnosis and treatment of superior labrum lesions.

SLAP References

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