Technical Note

Overlap Arthroscopic Bankart Repair: Reconstruction to the Glenoid Rim

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Abstract: A new arthroscopic approach for traumatic instability has been developed with which avulsed capsulolabral tissue can be effectively attached to the glenoid articular rim with sutures, providing anatomic reattachment and effective deepening of the glenoid concavity similar to that achieved by open repair. This technique does not depend on fixation devices, trans-scapular drilling, or implantation of suture anchors. The fixation of the labrum using the punch-chop needle overlap technique (Aeratec Inc, Uniondale, NY) for reattaching torn labral tissue to bone allows ease of suture placement for Bankart lesion repair, with the fixation overlapping the rim of the glenoid. The technique presented here includes preparation of the glenoid rim, drilling of the glenoid tunnels, and peripheral suturing of the labrum. Key Words: Bankart lesion—Overlap repair—Punch-chop needle—Arthroscopy.

The reported incidence of Bankart lesions with recurrent anterior shoulder dislocation varies from 3% to 100%. The open Bankart procedure performed by reattaching the detached anterior labrum to the freshened scapula with 1 or 2 nonabsorbable sutures through drill holes placed in the rim of the scapula has proven to be successful. Both the Neer-Bankart and Rowe-Bankart repair technique gave an excellent result in more than 95% of cases in most of the literature reports.

Arthroscopic surgery for the treatment of anterior dislocation of the shoulder has mainly been reported in Bankart lesions. The techniques can be divided into 2 basic groups, those involving sutures and those involving fixation devices. The most common suture techniques include the single-suture technique of Morgan and Bodenstaedt and the multiple suture technique of Caspari. The implant technique involves the use of a stable screw, a cannulated screw, a biodegradable tack, or anchors. Excellent results were reported by Caspari, Morgan, Hawkins, Johnson, and Snyder. However, not all investigators have reported such excellent results. Matthews et al. reported a 24% failure rate with stable screws. Grana et al. reported a 44% failure with the trans-scapular suture technique. Wolin reported a 27% recurrence rate and Maki reported a 23% reoperation rate with similar techniques. The average failure rate of arthroscopic repair in the literature was over 12%, compared with 5% for open repair. This discrepancy in outcome is mainly due to inadequate reconstruction of the capsular deficiency and restoring the glenoid concavity.

A new arthroscopic procedure was developed to achieve the following goals: reattach the labrum and capsular ligaments anatomically to the glenoid rim and deepen the glenolabral concavity. The technique attempts to duplicate Bankart open surgical repair. No implantation is required, there is no need to cut tendons or tissues, no danger of harming neurovascular structures is present, it is not difficult to perform, and there is no increase in the cost of surgery.
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The patient is in a sitting position with the arm hanging in neutral rotation so that the ligament tension can be adjusted with the arm in neutral position, thus preventing hyperextension or over-tightening. A standard posterior portal is used to visualize the glenohumeral joint using a 70° arthroscope.

An anterior-lateral-superior portal is established for instrumentation immediately above the upper border of the lateral end of the subscapularis, using a spinal needle to ensure correct portal positioning. If a Bankart detachment of the anterior labrum is present, it is reattached before dealing with the stretched anterior capsule. The labrum interval between the soft tissue and the articular glenoid rim–scapular neck interface is debrided and mobilized using a motorized shaver, taking care to avoid injuring the articular glenoid or labrum. The bony scapular neck to the glenoid rim is abraded to create a punctate bleeding bone surface. A 2-mm K-wire is passed posteriorly through the skin about 3 cm below the posterior standard portal and placed about 3 mm posterior to the margin of the anterior glenoid rim at the aspect of the Bankart lesion (Fig 1).

The punch-needle guide is then placed onto the K-wire and passed through the skin to inside the joint and the K-wire is held at an angle of 20° to 30° to the articular surface and drilled through the glenoid rim. When the wire exits beyond the bony scapular neck, it is removed, and the punch-needle (a 1.5-mm wire) passes the suture through the hole in the anterior glenoid.

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**FIGURE 1.** A 2.4-mm K-wire is used to make a hole through the anterior glenoid 2 to 3 mm posterior to the edge in the articular surface anteriorly after placing a guide onto the wire.

**FIGURE 2.** A punch-needle is used to pass the suture through the hole in the anterior glenoid.

**FIGURE 3.** (A) The chop-needle suture puller is passed through the skin, the subscapularis, and the labrum to pull the suture out. (B) Alternative step: (Left) A second punch-needle is passed through an anterior medial portal and through the labrum, and the suture is pulled out through the medial lateral portal with a ring forceps. (Right) The posterior punch-needle with the suture is then pulled out to bring the suture of the anterior punch-needle through the glenoid rim.
with a No. 2 absorbable (or nonabsorbable) suture is inserted through the guide and drill hole (Fig 2). The guide is removed and a 0° chop-needle suture-puller (or 45° puller) is passed anteriorly through the skin and the subscapularis inside the joint at the level of the detached labrum, using a spinal needle to ensure correct positioning. The chop-puller is then passed through the capsule medial to the labrum to pull the suture out (Fig 3A).

The punch-needle wire is pulled back through the superior portal outside the joint and cut from its junction to the suture (Fig 4). If the chop-puller does not reach the suture medially, the wire can be easily bent laterally with a hook in front of the scapular neck so as to be within reach of the chop-puller. From the anterior portal the lower posterior and the anterior limbs of the suture are picked up from the lateral side of the labrum using the ring forceps and brought up through the anterior cannula (Fig 5). If required, the technique can be repeated by placing the drill guide further superiorly along the glenoid rim to place another suture.

Using a knot-pushing device, the 2 limbs of the sutures in the anterior cannula are tied together with a slip knot and alternating half hitches to securely cinch the tissue against the glenoid rim (Fig 6). I use the giant knot-tying technique. A palpating probe should test the integrity of the repair. After reconstruction of the labrum, the anterior capsular posttraumatic stretching due to the repeated dislocation episodes, if present, is repaired. The technique I use for this is the L-type arthroscopic cruciate shift technique.

After surgery, the shoulder is immobilized for 3 weeks, followed by progressive exercises without infraspinatus strengthening or subscapularis stretching for another 3 weeks to avoid disturbing healing of the anterior capsule.

Over a 42-month period, a total of 26 Bankart lesion repair procedures have been performed using the overlap punch-chop–needle technique. There have been no intraoperative complications associated with surgery and all patients have shown evidence of healing.

Many arthroscopic Bankart repair techniques have been reported in the literature. In all of them, there is a higher redislocation rate than after open procedure, mainly due to the loss of glenoid concavity and a detached inferior glenohumeral ligament or unrepaired anterior capsular damage. The advantages of
this procedure are that it does not rely on transosseous sutures adjacent to neurovascular structures, there is no implant used, and it allows the same reconstruction as with the gold standard open Bankart repair. Rehabilitation is uninhibited by surgical scarring as in open repair. The holes placed arthroscopically are less traumatic than those placed for open surgery using a standard Bankart awl or suture passing drill.46,47 No complications of early or late articular surface damage have been reported with the open method.46,47 In summary, this method aims to provide the reliability of the open repair and the advantages of the minimal invasive surgery.

REFERENCES


