ARTHROSCOPIC FIXATION OF COMMINUTED BONY BANKART LESION WITH REPAIR OF MASSIVE RETRACTED ROTATOR CUFF TEAR-A TECHNICAL NOTE

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Abstract:

Managing concomitant cuff tear with comminuted bony bankart is a challenging scenario. Appropriate management of bony pathology and the rotator cuff ear is necessary in cases associated with both. Bony Bankart with considerable glenoid involvement results in recurrent instability if not treated accordingly. We describe our preferred technique of bony bankart repair with rotator cuff repair in a seventy years old male diagnosed with large comminuted bony bankart lesion along with massive cuff tear.

Introduction:

The association of comminuted bony Bankart with massive rotator cuff tears is rare(1). Various techniques are described for bony bankart fixation which include labrum alone, transosseous, and double-row repair(2,3,4). However, arthroscopic management of a comminuted bony Bankart lesion is less reported in the literature(5). In this Technical Note, we describe our preferred arthroscopic bony bankart repair technique using the transosseous method, incorporating a comminuted bony Bankart fragment and rotator cuff repair.

Case:

Seventy years old male presented with complaints of pain and difficulty in moving the right shoulder for the last 3weeks following a trivial fall, which was associated with dislocation of the right shoulder, which was reduced and immobilized. The patient could do routine activities using the right shoulder without any symptoms before the fall. On examination glenohumeral joint was tender, and movements were painful, with no neurovascular deficits.

Evaluation and Preoperative planning:

The evaluation included radiographs. AP view showed mild haziness in the anteroinferior glenoid rim. A computed tomographic scan(CT) and a 3D reconstructed glenoid after subtraction of the humeral head(En-face view)

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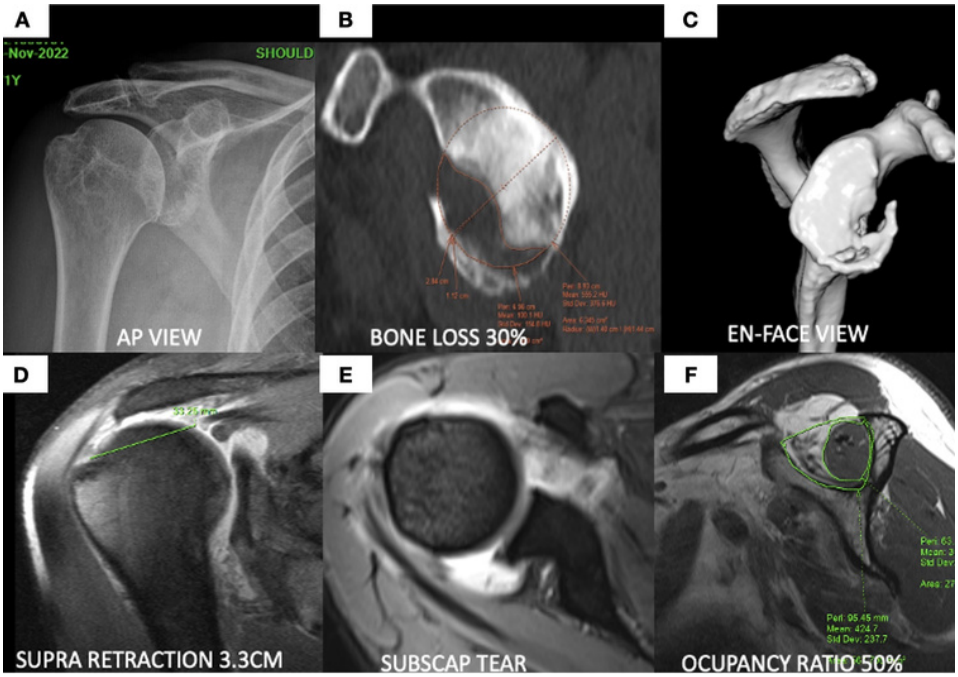

Fig 1 : Pre-operative imaging . A: Plain radograph, B&C: CT images, D, E, F: Coronal, axial and sagittal MRI cuts.

confirmed comminuted bony anteroinferior glenoid rim fracture, and glenoid bone loss accounted for 30%. Magnetic resonance imaging(MRI) revealed a supraspinatus tear(3.3cm retraction)and an infraspinatus tear (3.2cm retraction)along with an upper third subscapularis tear. An occupancy ratio of 50% and grade1 fatty infiltration were noted(Fig 1).

The technique of bony Bankart repair:

An interscalene nerve block is administered preoperatively. After the induction of general anaesthesia, the patient is placed in the lateral decubitus position. An axillary roll is placed, and the right shoulder is suspended in a traction arm holder.

A standard posterior portal is established, and the arthroscope is advanced into the glenohumeral joint. Diagnostic arthroscopy is performed. An anterior portal is established using an outside-in technique under spinal needle localization, and an 8-mm cannula is inserted.

An anterosuperior portal is established, and a 6-mm cannula is inserted. The arthroscope is switched to the anterosuperior portal. The labarum and bony Bankart lesions are probed from the anterior portal. Labral injury extended from 2'o clock to 6'o position, and the labrum was detached and separated from its continuity. The glenoid rim is comminuted with three fragments. The main fragment which is attached to the labrum; one small upper fragment is independent, and a lower-middle fragment is interposed between the glenoid and the main fragment. (Fig 2A). The reducibility of the fragments and labarum is checked provisionally by mobilizing them to their appropriate position with an arthroscopic grasper.

The first anchor is inserted at a 4 o'clock position. Through the anterior portal, a pilot hole is made, and a double-loaded anchor (Fig 2B) is inserted. A 6-mm cannula is inserted into the joint through the posterior portal. Alternate Sutures are retrieved and parked in the posterior portal. A long straight large, bore needle(14 gauge needle used in hip arthroscopy) is introduced from the posterior

portal, the main fragment, along with the labrum attached to it, is held with an arthroscopic grasper, and the needle is advanced through the bone (Fig 2C) while counterforce is given by the arthroscopic grasper holding the fragments from the anterior portal.

Nitinol wire is passed through the large bore needle and retrieved anteriorly, sutures that are parked in the posterior portal are fed into the opposite end of the nitinol wire, and the sutures along with nitinol wire are pulled out through the anterior portal. The same steps are repeated again with another set of sutures to complete the horizontal transosseous stitch(Fig 2D). These sutures are tied using sliding knots through the anterior portal with knots positioned on the bone. The gap between the glenoid and the main bone fragment gradually closes, compressing the middle fragment to the glenoid with successive knots.

Postero lateral portal is established. A suture-passing device curved to the opposite shoulder (in our case, left curved suture passing device) is introduced through the posterolateral portal and passed through the posteroinferior capsule and labarum at 7'o clock position(Fig 2E). suture tape is passed through the lasso, and both ends of the tape are retrieved through the anterior portal. A pilot hole is made for a knotless anchor at a 5.30 o'clock position over the glenoid rim(Fig 2F). The suture tape is secured to the glenoid using a knotless anchor. While performing this step, care should be taken to leave an adequate length of suture tape to avoid forceful bunching up of the labarum onto the glenoid. This compresses the lower middle fragment to the glenoid and gives additional support to the construct.

Rotator cuff repair:

After completing the bony Bankart repair, The arthroscope is shifted to subacromial space through the posterior portal. Supraspinatus and infraspinatus are retracted till the glenoid with a tear involving the upper third of the subscapularis(Fig 3A). Rotator cuffs mobilized by doing subacromial and supra glenoid release. Subscapularis, supraspinatus & infraspinatus is repaired using double row cuff repair technique(Fig 3B). After completing the repair, checked for stability and impingement on rotations. Portals are closed using absorbable sutures.

Rehabilitation:

The arm is placed in a shoulder abduction brace. Active elbow and wrist movements start from day one postoperatively, and passive range-of-motion exercises after three weeks. The abduction brace is used for six weeks, progressively advancing to an active range of motion to achieve a full range of motion in 3months. After that, shoulder strengthening exercises are started. Total return to activities is allowed six months after surgery.

Discussion:

Appropriate management of bony pathology and the rotator cuff tear is necessary in cases associated with both (6). Bony Bankart with considerable glenoid involvement results in recurrent instability if not treated accordingly (7). In our case, though it is associated with instability and rotator cuff tear, our focus is on the technical aspect of repair of bony Bankart.

The technique described above is a straight forward alternative for reducing and stabilizing large bony Bankart fractures associated with comminution. This technique enables the incorporation of the unstable fragments into the repair indirectly without requiring sutures to be passed through small independent fragments.

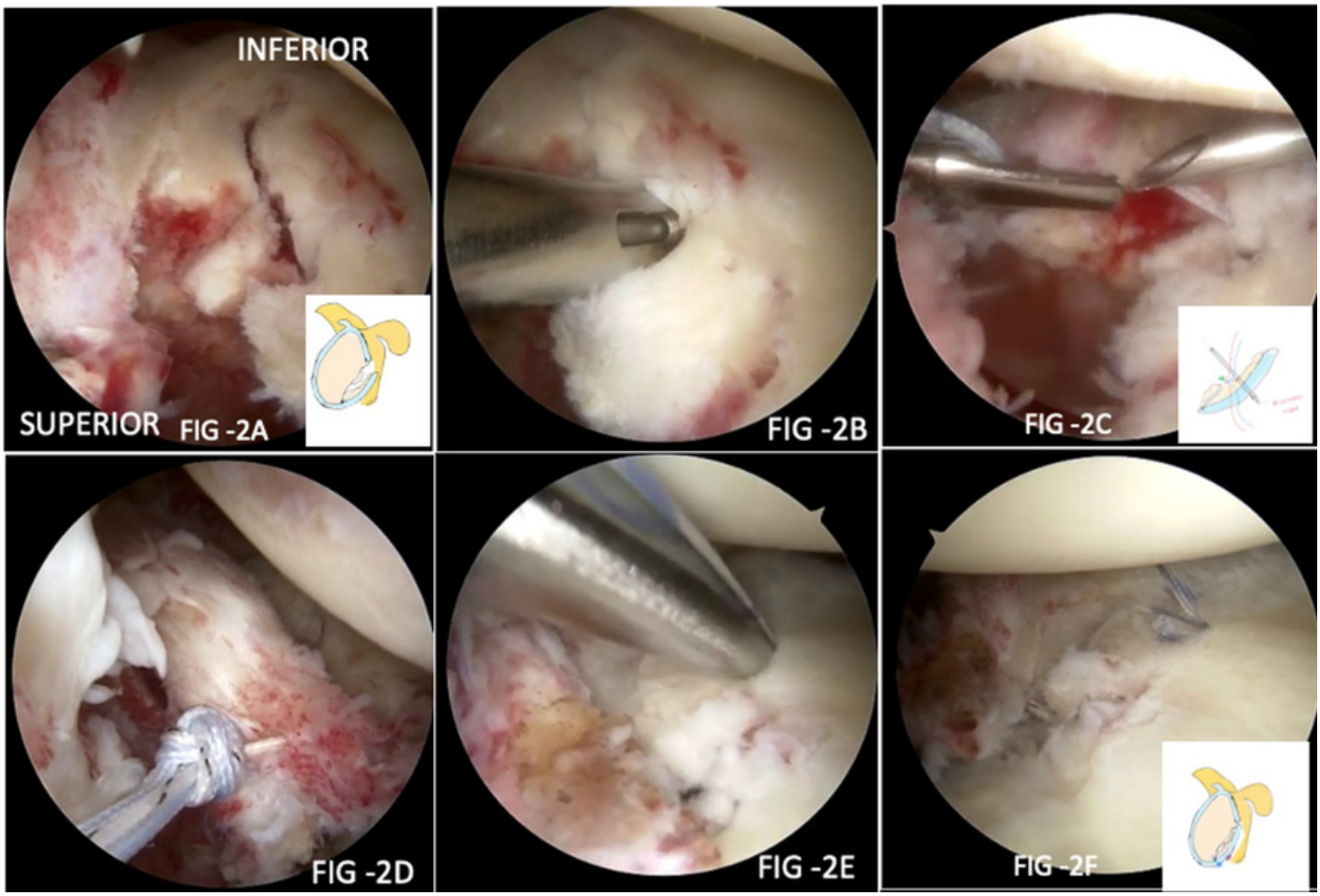

Figure 2: Intra-operative arthroscopy imaging: A: Comminuted bony bankart, B: Inserting double row anchor, C: Inserting a 14 gauge Hip arthroscopy needle through the bony fragment, D: Completed horizontal mattress transosseous stitch, E: Making a pilot hole for the push lock anchor for the inferior labral stitch, F: Completed repair

The advantage of using an arthroscopic technique for cases with concomitant bony Bankart and cuff tears is that it allows close inspection and management of associated intra-articular pathology and confirmation of anatomic reduction. It also avoids the morbidity and complexity of an open surgical approach.

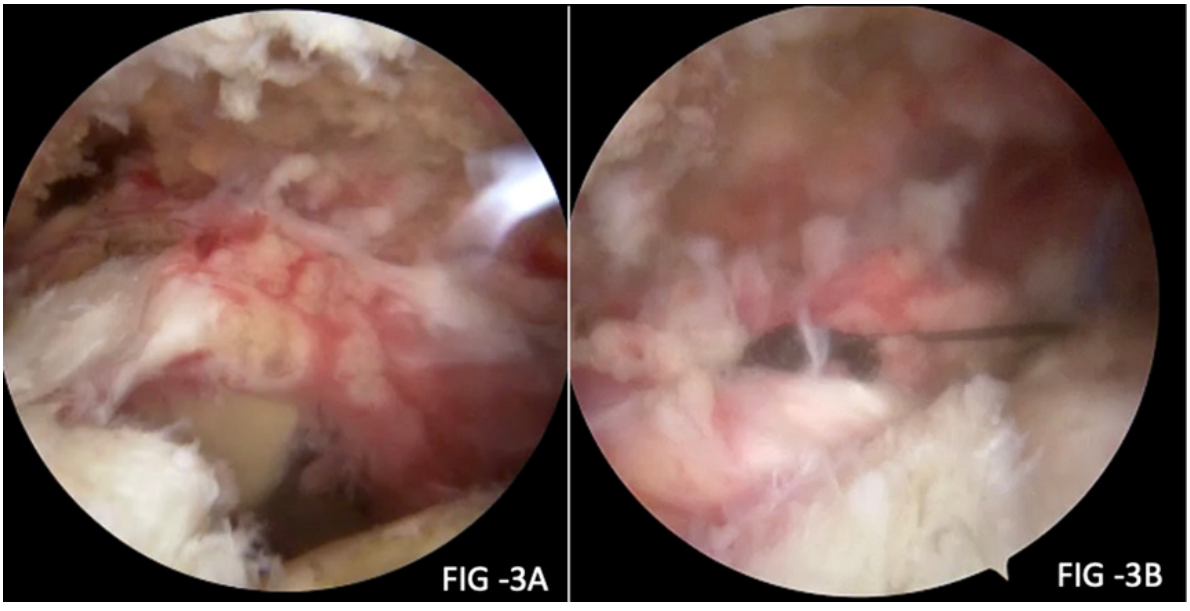

Fig 3: Intraoperative images showing cuff tear. A: Retracted cuff tear, B: Completed Double row cuff repair

Conclusion:

- Transosseous repair gives robust compression for the comminuted independent glenoid bony fragment.
- Addressing the rotator cuff tear along with bony bankart arthroscopically avoids the morbidities associated with open surgical procedures.

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