

### **Short to medium term results of Open Bankart’s repair in recurrent anterior dislocation of the shoulder**

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**How to citation this article:** Dr. Navin Singh, Dr Ketan Shah, Dr. Ashish Kumar Gupta, Dr. Vimal Naik, “Short to medium term results of Open Bankart’s repair in recurrent anterior dislocation of the shoulder”, IJMACR- September – October - 2022, Vol – 5, Issue - 5, P. No. 184 – 192.

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**Type of Publication:** Original Research Article

**Conflicts of Interest:** Nil

#### **Abstract**

The study was done to assess the short to medium term results of Open Bankart's repair, using 3 suture anchors, in 12 patients of recurrent dislocation of shoulder, with an MRI proven Bankart's lesion, which were operated upon at Raipur Institute of Medical Sciences from January 2017 to April 2022. The patients were followed up with clinical examination by the operating team, shoulder Xray's, and a self-assessment questionnaire. The results were graded according to Rowe score and WOSI (Western Ontario Shoulder Instability) index. There was no incidence of radiolocalization over a mean period of follow up of 144 weeks. The mean Rowe score preoperatively was 38.75 which improved to 82.5 after surgery. There was no incidence of surgical site infection or need for a revision procedure. The results were excellent in 4 (33.33%) cases, good in 7 (58.33%) and

fair in 1 (8.33%) case. The study shows open Bankart's repair surgery to be a reliable technique to address anterior shoulder instability, with low dislocation and reoperation rates in the short term.

**Keywords:** Open Bankart's Repair, Recurrent Dislocation of Shoulder, Anterior Instability of Shoulder, Bankart's Repair, Bankart's Lesion.

#### **Introduction**

Shoulder is one of the most mobile joints of the body as it trades its stability in exchange for the greater range of motion. The spherical head of the humerus sits in a shallow saucer like glenoid cavity or fossa, giving its bony morphology considerable mobility, but at the cost of stability. This makes shoulder potentially unstable and it is one of the most frequently dislocated large joints of the body.<sup>(1)</sup>The stability of the shoulder joint is primarily achieved by soft tissue structures, comprising of glenoid

labrum, shoulder joint capsule and the glen humeral ligaments. Shoulder dislocations cause injury to these soft tissue stabilizers which may never heal, giving rise to the risk of recurrent dislocations.

Mclaughlin et al have recognised two distinct groups of shoulder dislocations, the recurrent and the non-recurrent dislocations. The former are seen in the younger age groups which affect the anterior labrum and anterior capsule, while the latter, which occur in the elderly, hamper the integrity of the rotator cuff and the greater tuberosity.<sup>(2)</sup>

The recurrent dislocations of shoulder of the young, can again be either anterior or posterior, presenting two different pathologies of anterior and posterior instability, but it's the anterior instability that is by far the most common, making up upon 95% of the cases of shoulder instability.<sup>(3)</sup> The anterior instability of the shoulder is caused by the detachment of the glenoid labrum from the glenoid rim, which can be seen in almost 85% of the cases of anterior dislocations of shoulder.<sup>(4,5)</sup> At times this detached labrum comes off with a small chip of bone from the anterior inferior glenoid rim, when it is termed as a bony Bankart's lesion. Recurrent episodes of dislocations can lead to an osseous defect or depression caused in the posterolateral part of humeral head resulting from the head getting abraded by the anteroinferior glenoid rim, as it comes out, known as the Hill-Sachs lesion. It can also cause glenoid bone loss, complicating the matters further, necessitating additional or alternate surgical procedures in place of anatomical repair of the defect itself.

An open surgery to repair the detached anterior glenoid labrum, back to the glenoid, employing sutures through drill holes in the glenoid rim or through suture anchors fixed to anterior surface of the glenoid rim, is termed an

open Bankart's repair, which has remained the gold standard for treating anterior shoulder instabilities and have been found to yield safe and predictably good outcomes<sup>(6,7)</sup> But in the last two decades, an Arthroscopic repair of Bankart's lesion has become exceedingly common, with a significant proportion of surgeries being done arthroscopically now. The higher complication rates seen with arthroscopic repair earlier, have gone down with time, with the advent of better techniques and suture anchors. The use of at least 3 suture anchors has brought down the rate of recurrence of dislocation as well. But the improvement in outcomes following arthroscopic repair has now plateaued, suggesting that no further improvement may be forthcoming with the addition of technological innovations or newer materials. Meanwhile, a recent comparative systematic review and meta analysis of results of open versus arthroscopic repair of the cases of anterior instability, spanning two decades, have shown similar clinical outcomes and external rotation, range of movements in both the groups,<sup>(8)</sup> suggesting that open Bankart repairs are still relevant and acceptable treatment option, for anterior instabilities of the shoulder. As open Bankart's repair surgeries are being routinely performed at our centre, we carried out this study with the aim of assessing the short to medium term results of the clinical outcomes following this surgery, especially with regards to the rate of radiolocalization and final range of movement achieved.

### **Materials and Methods**

The study design was that of a retrospective study with a current follow up. 12 patients that underwent open Bankart's repair at Raipur Institute of Medical Sciences, Raipur, India, between January 2017 and April 2022, were included in this study. The list of the names,

addresses and contact numbers of all the patients that had undergone open Bankart's repair at our institution in last 5 years was collated and these patients were called for a follow up since April 2022. Twelve patients turned up, who were then examined clinically, given a self-assessment questionnaire, and were radiographed. Their past clinical record was retrieved from the medical record section of the institute, and the imaging films and discharge cards of the patients, if available, were analysed.

The mean age of patients was 36 years, and 10 were males, the rest being females. The patients had an average of 3.66 episodes of recurrent dislocations before submitting themselves for surgery. The mean duration from the first event of dislocation and surgery was 80 weeks. The oldest patient was a 68 year old lady, with a Bankart's lesion confirmed on her MRI.

All patient's had undergone thorough clinical examination and an MRI prior to surgery. Patients with significant Hill- Sach's lesion, or glenoid bone loss on MRI, were subjected to a 3 D CT and the 3 D CT was used to decide whether a open Bankart's repair was a viable option. Those with more than 20% of glenoid bone loss, or an engaging, off-track Hill-Sachs lesion were offered a Latarjet procedure. All patients were operated upon, by the lead author.

Patients were operated under General Anaesthesia or interscalene block. Patients were positioned supine with the head-end of the operating table tilted up by 30°. A 5 cm incision over the deltopectoral interval, starting from anterior inferior axillary crease was taken, the deltopectoral groove developed after retracting the Cephalic vein laterally. The conjoint tendon was retracted medially and fibers of deltoid laterally. The limb was placed in external rotation to put subscapular is

in tension. The biceps tendon and the lesser tuberosity was palpated and subscapularis tenotomy was done in its upper two thirds. The rotator interval was inspected and repaired if needed at this point. The subscapularis was dissected free from the underlying capsule and a horizontal or T shaped incision was given on the capsule, with the T based laterally. The Bankart's lesion was probed with a Cobb's elevator, and anterior surface of glenoid abraded with a rasp or a burr. Three 3.0 mm suture anchors were placed on the anterior glenoid rim, at 3, 4 and 5 position for right shoulder and 7, 8 and 9 for the left. After repair for capsulolabral complex to the anterior glenoid with suture anchors, inferior capsular shift with a vest on pants repair was done. The subscapularis was repaired using a modified Mason-Allen stitch.

All patients were kept in an arm sling for 4-6 weeks. Pendulum exercises were initiated as early as possible. External rotation was restricted to 30° for 6 weeks.

The patients which were seen for the follow up were interviewed for their demographic details, and the details of their clinical examination were tabulated. They were assessed by Rowe score<sup>(9)</sup> and WOSI (Western Ontario Shoulder Instability Index) score questionnaire.<sup>(10)</sup>

### **Results**

The mean age of patients at the time of surgery was 35.83 years, the eldest patient being 68 years showing that recurrent dislocation of the shoulder is at times also seen in the elderly. The mean duration of follow up was 143.75 weeks, range being 17-267 weeks. Patients had had an average of 3.66 episodes of dislocations prior to the surgery, with one patient with about 6 or more episodes (patient vaguely remembered 6 but it could have been more). The mean time that had lapsed from first episode of traumatic dislocation to the time patient

got operated upon was 79.75 weeks. The earliest that the patient came for surgery after the first episode was 36 weeks (2 patients) and the one who came after the greatest time lapse, came after 154 weeks, after the first instance of dislocation.

The mean Rowe score was 38.75 (range 30-45) which improved to a mean of 82.5, with one with the best result clocking a score of 95. The elderly lady aged 68 years had a fair result with a score of 65, which was by far the worst. It was due to, perhaps, the advance age, the short follow and the tendency of the shoulder joint to go stiff after any traumatic episode or surgery, at this age.

### **Discussion**

Treatment of anterior instability of shoulder, vary from procedures done on the subscapularis (Putti-Platt procedure), to bony block procedures (Eden-Hybbinette operation), to procedures that involve coracoid transfer (Bristow, Latarjet procedures), or an anatomical repair of the defective pathology itself i.e. the Bankart's lesion (Bankart's repair). The double breasting of the subscapularis, to beef up the anterior stability of shoulder was described independently by Putti and Platt in 1920s, and was named as the Putti-Platt procedure in a paper by Osmond- Clarke in 1948, which emphasized the need for blocking the humeral head from coming out from the anterior defect and a limitation to external rotation, as necessary factors at preventing dislocation.<sup>(11)</sup> But high incidence of recurrence and shoulder osteoarthritis<sup>(12)</sup> and loss of external rotation to the tune of 23-24 degrees<sup>(13)</sup> has made this procedure largely obsolete. An even larger rate of recurrent dislocation and osteoarthritis has been noted for a bone block procedure termed the Eden-Hybbinette operation.<sup>(12)</sup> The coracoid transfer procedures like Bristow and Latarjet have been highly successful

surgeries in preventing radiolocation, but patients who had undergone Latarjet procedure have an edge, in cases with substantial glenoid bone loss, over those undergoing a Bristow procedure, as far as the incidence of radiolocation is concerned.<sup>(14)</sup> This has made Latarjet procedure a preferred method of treatment for anterior shoulder instability with >20% glenoid bone loss and in high demand athletes with even a 10-20% glenoid bone loss.<sup>(15)</sup> Another reason for enduring popularity of open Latarjet procedure is studies that show statistically significant, substantial better results following this procedure as compared to arthroscopic Bankart's repair, and decreasing effectiveness of the latter over time.<sup>(16)</sup>

The Bankart's lesion and the anatomic repair of the lesion were described by AS Bundell Bankart in his landmark 1938 paper (1) and an open Bankart's repair has been a useful and effective tool in the armamentarium of the Orthopaedic surgeons ever since. But with the advent of arthroscopic technique and the greater familiarity of orthopaedic surgeons with arthroscopic techniques, and refinement of materials and techniques used for arthroscopic Bankart's repair, have sounded a death knell for the open surgery. The benefits of an arthroscopic surgery are shorter incision, less blood loss, faster recovery of shoulder movements, sparing the subscapularis tendon with theoretically lesser loss of subscapularis power as compared to open surgery, the ability to differentiate between off track and on track lesions of the humeral head, and perform the remplissage procedure if needed, and to address other concomitant shoulder pathologies in the same setting. The open surgery on the other hand allows a comprehensive surgical restoration of antero inferior capsulolabrum complex along with the ability to perform a large capsular shift.<sup>(17)</sup> These factors may tilt the scales

in favour of an open repair, as arthroscopic repair using all the current techniques and innovations, has still been found to end up with persistent capsular laxity and poorer outcomes with regards to radiolocation and revision surgery vis a vis the open repair.<sup>(18,19)</sup>

A failure rate of 3-9% percent was reported in 1978<sup>(20)</sup>, and 9.7% recurrent instability over a 10 years follow up period was reported in 2007, where suture anchors were employed for a modified open Bankart's repair.<sup>(21)</sup> Over a longer follow up period of 20 years a recurrence rate of 17.5% and a revision rate of 4.2% has been reported more recently in 2015.<sup>(22)</sup> On the other hand, much higher recurrence rate of 35% at 8-10 years have been noted for an Arthroscopic Bankart's repair.<sup>(23)</sup>

Athletes in contact sports are known to have a higher recurrence rates following Bankart's repair for shoulder instability, whether done open or arthroscopically. But a 2008 study found only 2 cases of recurrence in a series of 103 patients of whom a majority were in collision sports.<sup>(24)</sup> A 2006 study found that the rate of recurrence in this subset of population was twice as higher (25%) following an arthroscopic surgery, as compared to an open surgery (12.5%).<sup>(25)</sup> A more recent study found a 50% higher recurrence rate in the arthroscopic group versus the open group in athletes engaged in contact sports.<sup>(26)</sup>

Revision surgeries again constitute a subgroup where open Bankart's surgeries categorically outperform its arthroscopic counterpart, with revision rates of 11.5% for the former<sup>(27)</sup> versus 36% for the latter.<sup>(28)</sup> A study has even reported that the bone loss whether in the humerus or on the glenoid side, doesn't affect the recurrence rate, when an open repair was performed.<sup>(24)</sup>

A head to head randomized control trial done in 2014, again found an open repair to have a lower recurrence rate of 11%, as compared to 23% of the arthroscopic repair, after 2 years.<sup>(29)</sup> A lower recurrence rate of 10.3% and a higher post-operative Rowe score of 88% for open surgery, has also been published as opposed to the figures of 20.3% and 71% respectively for an arthroscopic repair.<sup>(30)</sup>

Our result of no radiolocation and need for revision surgery and excellent to good results in 91.66% of cases, testify to the efficacy and low complication rates associated with this surgery. Good post-operative Rowe and WOSI scores also suggest that this surgery can give comparable if not better results than an arthroscopic repair. The fact that one patient with advanced age and low follow up period could have skewed up the mean scores downwards, also favours the short term results achieved in our series. The review of literature gives enough robust evidence in favour of open repair as opposed to either an arthroscopic repair or a Latarjet procedure for the majority of the cases, of all age groups, all activity levels and all degrees of bone loss, whether it is of glenoid or humeral head. There is also a strong case to rely on open repairs for revision surgeries.

### **Limitations**

The short duration of follow up and a paucity of cases are limitations of this study. A more heterogenous group of patients especially those with glenoid bone loss and patients engaged in contact sports would have made this study more representative, for high demand individuals and for those with osseous defects, to compare it to alternative procedures like the Latarjet surgery.

### **Conclusion**

This study makes a strong case for opting for an open Bankart's repair for anterior instabilities of the shoulder.

The study matches the reported results of open Bankart's repair in literature and better the results achieved by arthroscopic Bankart's repair. A longer follow and a bigger number of cases would make the results more conclusive and exemplary.

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Legend Figure and Graph

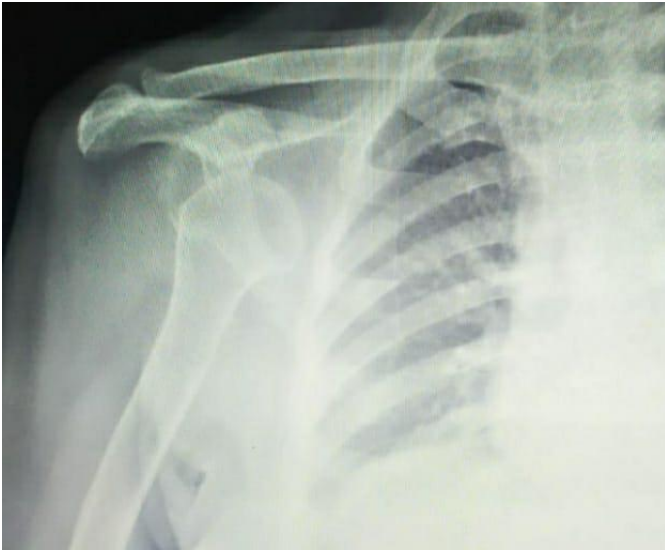


Figure 1: Anterior dislocation of shoulder in a 68year/female



Figure 3: 68year/female after Open Bankart's repair with 3 suture anchors.

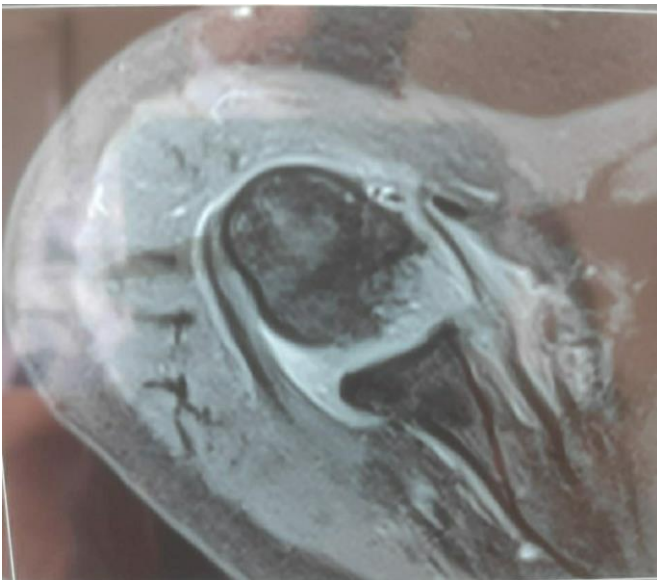


Figure 2: MRI of 68year/ female showing a Bankart's lesion



Figure 4: 30 year / Male, post op X- Ray after Open Bankart's repair.



