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Retrospective Study

Minimum 10-year follow-up outcomes of arthroscopic Bankart's repair with metallic anchors – reliable results with low re-dislocation rates

Metal anchors in Bankart's - long-term outcomes

Abstract

BACKGROUND

With stiff competition from alternative albeit more expensive counterparts, the relevance of metallic anchors in the current context becomes important to establish for shoulder instability. This, in part, can be consolidated by analysing long-term outcomes with the latter.

AIM

We analysed minimum 10-year outcomes from 30 patients following arthroscopic anterior stabilisation using metallic anchors.

METHODS

Prospectively collected data from arthroscopic Bankart repairs performed using metal anchors during 2007P-2010 was retrospectively analysed in this single-surgeon study. Comprehensive data collection included historical and clinical findings, dislocation details, operative specifics, follow-up radiological and clinical findings including shoulder scores. The primary outcomes were patient-reported scores (Constant, American Shoulder and Elbow Surgeons (ASES) and Rowe scores) and pain and instability on a Visual Analogue Scale (VAS).

RESULTS

A 3% recurrence rate of dislocation was noted at latest follow-up. Total constant scores at 10 years postoperatively measured between 76 and 100 (mean 89) which were significantly better from preoperative scores (mean 62.7). Congruous improvements were also noted on the Rowe and ASES scores and VAS at 10-year review.

CONCLUSION

Reliable long-term outcomes with metallic anchors in surgery for shoulder instability can be expected. Our results reiterate their continued, cost-effective presence in the modern scenario.

INTRODUCTION

In 1923, AS Blundell Bankart described a lesion named after him in anteriorly dislocated shoulders wherein the capsule was said to have detached from the fibrocartilage. The technique described by him was based on 4 patients and the defect was repaired by interrupted silkworm gut sutures [1]. These have evolved from open procedures to arthroscopic techniques with remarkable and ever-improving success rates [2,3]. The popularity of arthroscopic repair is demostrated by a 90% preference in shoulder surgeons and this has been on the rise [4]. This comes despite a prevailing heterogeneity in the long-term outcomes with rates of recurrent instability ranging from 3-41% [5]. Perhaps a learning curve is responsible, among other factors, for these figures as recurrent dislocation has improved from 30% in 2000-2005 [6] to 7.6% in 2004-2008 [2]. A paucity of data also exists on the patient-reported clinical outcomes and scores after surgery and its correlation with re-dislocation rates [7].

Among arthroscopic stabilisation techniques, the use of metallic *vs* bioabsorbable anchors has also been an area of controversy. With prospective randomised studies suggesting no difference in 2-year outcomes, the case for continued employability of the

more cost-efficient metallic anchors stands strong [8]. Evidence on survival and outcomes of shoulder stabilisation with metallic anchors for recurrent shoulder dislocation remains sparse. Though bioabsorbable screws have emerged as popular alternatives to avoiding drawbacks with their metallic counterparts, they have not quite yet phased out the latter.

The present study was designed to evaluate long-terms results of arthroscopic Bankart repair with metallic anchors in shoulder stabilisation for anterior dislocation. We hypothesised that satisfactory outcomes would be seen in a majority of the patients undergoing this procedure using these implants.

MATERIALS AND METHODS

Study design: Prospectively collected data of thirty-three consecutive patients who underwent arthroscopic Bankart repair during 2007-2010 was retrospectively analysed. All patients were between 15-45 years of age and had a diagnosis of recurrent (≥ 2 episodes) traumatic anterior shoulder dislocation. Those with atraumatic dislocations, bony Bankart lesions, multi-directional instability, generalised laxity, co-existing cuff tears and habitual dislocation were excluded. The single-surgeon study was performed at a tertiary care teaching centre.

Clinical data: Findings from historical and clinical assessment were recorded including demographics, socioeconomics, mode of injury, profession and hand dominance. Details of each dislocation before and following the Bankart repair including need for hospital admission were also included for analysis (figure 1).

Operative details were assessed from anaesthetic charts, positioning and operative details including any additional procedures recorded. Data collected at follow-up included a full upper limb examination including range of movement (ROM) and tests for shoulder stability. The Visual Analogue Scale was used for grading patient satisfaction and shoulder scores employed for data collection were the Constant score, American Shoulder and Elbow Surgeons (ASES) score and the Rowe score [9-11]. Patient reported symptoms of pain and stability were also recorded on a visual analogue scale

(VAS) with scores of 1 representing the worst pain and instability and 10 representing no persistent symptoms.

Radiographs were obtained at sequential reviews and included standard AP, lateral, outlet and stryker views.

RESULTS

Among 33 patients matching the inclusion criteria, 3 were lost to long-term follow-up. Mean age among patients was 25 years with a striking preponderance for the male gender and the dominant arm (tables 1-3).

Less than half of the patients had between 2-5 dislocations prior to the stabilisation procedure while the majority had 6 or more episodes (table 4). The time taken to receive surgery was more than a year since the first dislocation in a majority of the patients (60%) (table 5).

Sports-related injuries were seen in most patients (80%) while the remainder were divided between motor vehicle accidents and miscellaneous injuries (table 6).

General anaesthesia was routinely employed for all patients in addition to standard lateral positioning with the arm in abduction holders. Posterior portals were primarily used for viewing while anteroinferior and anterosuperior portals were used as working portals.

In 80% patients the lesion observed intraoperatively was a Bankart between 3-5 o'clock position. An associated non-engaging Hill Sachs lesion was seen in 60% patients. These were deemed to be small and were not surgically addressed. The use of 2 metallic anchors was deemed satisfactory intraoperatively in the majority (86.7%) of patients. The others required 3 anchors. Capsular plication was necessitated in 3 cases.

At mean 10 years postoperatively, 3% patients had a recurrence of dislocation. Among outcomes, total constant scores at one year measured between 76 and 100 with a mean score of 85.7 while at 10 years postoperatively these again measured between 76

and 100 with an average of 89 for all 30 patients. These were considerably improved from preoperatively recorded scores (mean 62.7) (tables 7 and 8).

Similar outcomes were echoed in the total Rowe score and the total ASES scores (tables 9 and 10). When separately evaluated, the ASES score for function displayed a stepped pattern in progressive improvement in the follow-up phase leading up to mean 10 years (table 11).

Overall, most patients were also satisfied at 10 years when asked about symptoms including pain and stability on the VAS scale (table 12).

At most recent visits to the clinic (≥10 years postoperatively), all patients were negative for clinically apparent drawer, relocation and load shift tests. Radiographic evaluation at mean 10-years did not reveal osteolysis, loosening, failure or any hardware migration in any of the patients. None of the patients had in advertent events like fractures or intraarticular penetration.

Our hypothesises of satisfactory outcomes in a majority of the patients undergoing arthroscopic Bankart repair with metal anchors proved accurate.

DISCUSSION

The present study represents reliable long-term results with metallic anchors for anterior shoulder instability. These have faced stiff competition from bioabsorbable screws in arthroscopic shoulder surgery despite no significant differences between the 2 implants in short-term and mid-term outcomes in case-control studies [12]. It has, however, been shown that metal anchors could potentially result in loosening and prominent hardware in shoulder surgery lest inaccuracies in surgical technique may occur [13, 14]. Analysing 28 reoperated shoulders with a mean 2.9 anchors per patient, Godinho *et al* reported in adequate anchor positioning in 57% patients [13]. To obviate complications, a step-wise intraoperative approach starting with the restoration of capsular tension anteroinferiorly with subchondral anchors has been suggested. Also,

an appropriate distance of 1-2mm from the articular margin along a 45° slope has been promulgated [15].

Among factors predisposing to early failure, research in the recent past has revealed interesting findings. These factors can be roughly grouped as technical/ surgical, patient-related and injury-related. Llng-term results from of 65 arthroscopically stabilised shoulders showed a dislocation rate of 35% in a series by van der Linde *et al* [16]. The authors reported use of fewer than 3 anchors and presence of Hill Sachs lesions as predictive for redislocation [16]. In a more detailed review, Ho *et al* have categorically described patient-related factors responsible for failure as younger male patients with higher number of preoperative dislocations. Technique-associated errors with recurrences have included "superiorised" and medialised glenoid anchors, ≤ 2 in number with poor suturing configuration. Among missed injuries, Hill Sachs, anterior glenoid defects, HAGL lesions and capsular laxity were common causes of failure of stabilisation procedures [17]. Literature suggests the occurrence of large engaging Hill Sachs lesions has, fortunately, a lower overall incidence of 7% among anterior dislocators [18]. Typically, non-engaging Hill Sachs have been managed non-surgically to good effect with minimal impact on outcomes [19, 20]. In the present series, a Hill Sachs lesion was seen in 60% patients all of which were non-engaging. The milder severity of these lesions could well be one of the reasons for very low (3%) postoperative recurrence rate of instability in our study at long-term 10-year follow-ups.

In the present paper, good long-term outcomes were achieved with 2 anchors in almost 90% patients. Emerging evidence has helped clarify the long-held contention of needing >2 anchors for success after shoulder stabilisation. In a recent paper from Halifax, Witney-Lagen *et al* demonstrated among 114 postoperative patients no significant differences in recurrent instability and Oxford Instability Scores (OIS) at mean 4-year follow-ups between recipients of 1 (62.3%), 2 (35.1%) and 3 (2.6%) anchors ($p>0.05$) [21]. Our findings echoed with the results from the above.

Higher than expected recurrence rates of 19.1% at mean 33 months of follow-up have surfaced from Brazil with the use of metal anchors for shoulder instability in 47 patients. Young age (≤20 years) was implicated as the only significant correlator for recurrence [22]. These are quite in contrast to highly satisfactory outcomes reported even with massive 270-degree labral tears at 10-years in young patients (mean age 27.1 years) [23]. We observed similar improvements in Rowe scores, the ASES and the VAS at 1-year and 10-year follow-ups in the present series (table 13). Recently published Turkish data from mean 41-month follow-ups of 67 patients has also demonstrated significant improvements in patient-reported outcomes (Rowe, Constant score) with low (3%) redislocation rates which are in agreement with present study (3%) [24]. Interestingly, the outcomes published by Uluyardımcı *et al* show no differences between all-suture and metal anchors used in their study group [24].

In a systematic review comparatively evaluating the outcomes and complications of absorbable and metallic anchors, Papalia included 4 randomised studies, 2 prospective cohort studies and 4 case series. The results from this large body of evidence could not offer a superiority of one device over another leaving us with the conclusion of choosing from the 2 options largely based on cost-effectiveness [25]. A lateral thought process continuing from the above also questions whether the "drift" to bioabsorbable sutures from the economically viable metallic sutures has actually been driven by scientific evidence [26]? Others have also suggested cognizance towards potential benefits vis a vis cost-effectiveness between newer and time-tested implant materials in shoulder surgery [27].

While we have addressed the lacuna in literature on long-term outcomes of shoulder stabilisation with metallic anchors, we acknowledge the limitations as a part of our research work. These include a relatively small sample size which, however, is very comparable to published literature on long-term 10-year outcomes in shoulder surgery. Also, the non-comparative nature of the paper could not directly draw comparisons between bioabsorbable and metallic anchors which could be addressed in another study design. Despite these limitations, the present research is one of the few if not the first to

determine the long-term trustworthiness of repairs with metal anchors for Bankart repairs.

CONCLUSION

The purpose of this research was to illustrate outcomes and results at 10 years following anterior shoulder stabilisation with arthroscopic repair of Bankart lesions with metallic suture anchors. With satisfactory long-term outcomes we can conclude clinically reliable results can be expected from the surgery provided a consistent technique and routine are adhered to.

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