



## Outcomes following arthroscopic Bankart repair in female patients



Thomas K. Moore<sup>a,b</sup>, Eoghan T. Hurley, MB, BCh, MCh<sup>a,b,c,\*</sup>, David N. Rowe<sup>a,b</sup>,  
Richard E. Hogan<sup>a,b</sup>, Conor J. Kilkenny<sup>a,b</sup>, Leo Pauzenberger, MD<sup>a</sup>,  
Hannan Mullett, MCh, FRCSI (Tr & Orth)<sup>a,b</sup>

<sup>a</sup>Sports Surgery Clinic, Dublin, Ireland

<sup>b</sup>Royal College of Surgeons in Ireland, Dublin, Ireland

<sup>c</sup>National University of Ireland Galway, Galway, Ireland

**Purpose:** The purpose of this study is to evaluate clinical outcomes and recurrence among women who have undergone an arthroscopic Bankart repair for recurrent anterior shoulder instability.

**Methods:** A retrospective review of patients with anterior shoulder instability that have undergone an arthroscopic Bankart repair between 2012–2017 was performed. Patients were followed up to assess their visual analog scale (VAS) score, Rowe score, Shoulder Instability–Return to Sport after Injury (SIRSI), and the Subjective Shoulder Value (SSV) and their satisfaction level. Whether they were able to return to sport, the timing of return, and the level to which they returned were reported.

**Results:** Our study included 31 female patients (34 shoulders), with a mean follow-up of 51.9 months. Overall, 82.4% (28/34 shoulders) were satisfied/very satisfied with their surgery. The mean scores were as follows: Rowe, 79.2; SIRSI, 53.9; SSV, 81.9; and VAS, 1.9. Of the 29 patients (32 shoulders) who played sport prior to surgery, 24 returned to play and 17 returned to the same or higher level. One patient suffered a recurrent dislocation and 2 patients suffered recurrent subluxation. No patients underwent a revision procedure.

**Conclusion:** Female patients with anterior shoulder instability treated with arthroscopic Bankart repair have low recurrence rates, with good patient-reported outcomes and high satisfaction rates. Of those participating in sport prior to surgery, there was a high rate of return to play. The overall rate of complications was low, with a low rate of revision surgery.

**Level of evidence:** Level IV; Case Series; Treatment Study

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**Keywords:** Bankart; anterior shoulder instability; female; sport; collision; arthroscopy

This study received ethical approval from our institution (reference no. SAREB02/12/18HM/NF), where the study was conducted using subset data from our retrospective study on return to play following shoulder instability.

\*Reprint requests: Eoghan T. Hurley, MB, BCh, Sports Surgery Clinic, Northwood Avenue, Santry, Santry Demesne, Dublin 9, Ireland.

E-mail address: [eoghanhurley@rcsi.com](mailto:eoghanhurley@rcsi.com) (E.T. Hurley).

Anterior shoulder instability is a common pathology among athletes, with an incidence rate of 0.12 injuries per 1000 athlete exposure hours.<sup>12</sup> Shoulder instability is more common in male athletes, and female athletes are more likely to sustain an instability event resulting from a collision with an object rather than contact with another player.<sup>12,14</sup> Treatment options range from conservative physiotherapy to surgical intervention, with recurrence rates being higher in those conservatively treated.<sup>8</sup> Thus, surgical intervention is often

indicated, with arthroscopic Bankart repair being the most common surgical procedure for anterior shoulder instability.<sup>10,13</sup>

Arthroscopic Bankart repair is highly successful as a shoulder stabilization procedure; however, there are still concerns regarding recurrence rates, although the majority of the literature focuses on primarily male patients.<sup>4,6,11</sup> As a result, little is known about outcomes of arthroscopic Bankart repairs in female athletes as the literature is predominantly populated with studies primarily including male athletes, with few studies stratifying and focusing exclusively on female athletes.<sup>4</sup> Similarly, despite Warth et al<sup>18</sup> finding return to play to be the most important expectation for patients undergoing shoulder stabilization, there is scant data focusing on this in female athletes.

The purpose of this study was to evaluate clinical outcomes and recurrence among women who have undergone an arthroscopic Bankart repair for recurrent anterior shoulder instability. Our hypothesis was that clinical outcomes would be satisfactory and would show a low rate of recurrence in female patients.

## Methods

### Data collection

A retrospective review was carried out on all female patients who underwent an arthroscopic Bankart procedure between 2012-2017 by a single fellowship-trained shoulder surgeon. The inclusion criteria were (1) traumatic anterior labral lesion, (2) minimum 24-month follow-up, and (3) female. Exclusion criteria included prior surgery on the ipsilateral shoulder, extension of the labral lesion to posterior, superior labrum anterior-posterior (SLAP) lesions, biceps tenotomy or tenodesis, and multidirectional instability.

Details regarding return to sport including level, timing, and if applicable reasons for not returning to sport at the same level were evaluated. Furthermore, follow-up included documentation of the ROWE score, the Shoulder Instability–Return to Sport after Injury (SIRSI) score, the visual analog scale (VAS) score, and the Subjective Shoulder Value (SSV) score, recurrence of dislocations or subluxations, range of motion asymmetry compared with the contralateral shoulder (forward flexion, abduction, internal rotation, and external rotation), revision surgeries, and complications.

### Surgical technique

All surgeries were performed in beach chair position under general anesthesia. An examination under anesthesia was performed on both shoulders to evaluate instability, range of motion, and joint laxity. A diagnostic arthroscopy through a standard posterior portal was performed, including dynamic examination to confirm the diagnosis. The capsuloligamentous complex was evaluated, and the glenoid and humerus were checked for osteochondral or osseous defects. A probe was used to confirm any instabilities of the labrum. The labrum was then mobilized and the glenoid bone freshened where applicable. The capsulolabral tissues were fixed to the glenoid rim with suture anchors approximately up to the 10-

or 2-o'clock position, respectively. Arthroscopic knots were positioned away from the joint to avoid glenohumeral irritation. In all cases, anatomic reconstruction including adequate tensioning of the anterior inferior glenohumeral ligament was attempted.

### Rehabilitation and return to play

Postoperatively, the shoulder was placed in a sling for 3 weeks, while allowing nonresisted activities of daily living without elevation of the shoulder. Patients immediately began physiotherapy, which continuously increased in intensity over the next 9 weeks. Return to contact in training was allowed after 12 weeks, whereas return to full contact and competition usually would follow within the next 3 months, depending on progress of physiotherapy.

### Statistical analysis

Quantitative statistical analysis was performed using SPSS version 22 (IBM SPSS, Armonk, NY, USA).

## Results

### Patient demographics

There were 466 arthroscopic Bankart repairs performed during the study period. Of these patients, 31 met the inclusion criteria, with 3 of the patients having undergone bilateral arthroscopic Bankart repairs, for a total of 34 shoulders. The mean age of the patients was 29.3 years (17-48). The number of dislocations prior to surgery ranged from 1 to more than 10 preoperative instability episodes, and the mean number of anchors used was 3.5 (2-6). Of the 29 patients who participated in sport, 17 (58.6%) played at a competitive level and 12 (41.4%) played at a recreational level. The mean Beighton score was 3 (0-9). The mean follow-up time was 51.9 (24-81) months.

### Patient-reported outcomes

Overall, 82.4% patients (28/34 shoulders) were satisfied/very satisfied, 11.8% (4/34 shoulders) were neither satisfied/dissatisfied with the procedure, and 5.9% (2/34 shoulders) said that they were dissatisfied/very dissatisfied (Table I). When asked if they would undergo surgery again, 88.2% said they would and 11.8% were unsure. The mean Rowe score at final follow-up was 79.2 (45-100). The mean SIRSI score at follow-up was 53.9 (0-98.3). The mean subjective shoulder value was 81.9 (40-100). The average VAS score was 1.9 (0-7).

### Return to play

Of those participating in sports before surgery, 75% (24) returned to play (Table II). The mean time of return to play was 6 (3-12) months. Of these 24 patients, 17 (70.8%)

**Table I** Patient-reported outcomes

Outcome	Mean score (range) or % (n/n)
Rowe score	79.2 (50-100)
SIRSI score	53.9 (0-98.3)
VAS score	1.9 (0-7)
SSV	81.9 (40-100)
Satisfied/very satisfied, % (n/n)	82.4 (28/34)

SIRSI, Shoulder Instability–Return to Sport after Injury; SSV, Subjective Shoulder Value; VAS, visual analog scale.

returned to the same/higher level of play. Of the 13 collision athletes, 11 (84.6%) returned, and of the 19 non-collision athletes, 13 (70.6%) returned. Of the 7 patients (24.1%) who did not return to play, 5 said that it was due to the shoulder injury and surgery and the other 2 stated that it was due to external life factors.

### Complications

There were no intraoperative complications in our series (Table III). Three patients had recurrent instability (subluxation/dislocation), with 2 having subluxation and 1 having redislocation, but none underwent revision surgery.

### Range of motion asymmetry

Range of motion asymmetry of the affected arm compared to the contralateral arm was reported: 10 patients (29.4%) reported forward flexion asymmetry, 10 (29.4%) reported abduction asymmetry, 8 (23.5%) reported external rotation asymmetry, and 19 (55.9%) reported internal rotation asymmetry (Table IV).

### Discussion

The most important finding of the current study was that female patients with anterior shoulder instability treated with arthroscopic Bankart repair showed good patient-

**Table II** Return to play

	Overall, n (%) (n = 32)	Collision, n (%) (n = 13)	Competitive, n (%) (n = 19)
Total	24 (75)	11 (84.6)	18 (94.7)
Same/higher-level RTP	17 (53.1)	7 (53.8)	13 (68.4)
Changed sport	4 (16.7)	2 (16.7)	3 (16.7)
Returned <3 mo	4 (16.7)	0 (0)	3 (16.7)
Returned 3-6 mo	11 (45.8)	8 (72.7)	8 (44.4)
Returned 6-9 mo	7 (29.2)	3 (27.3)	6 (33.3)
Returned ≥12 mo	2 (8.3)	0 (0)	1 (5.6)

RTP, return to play.

**Table III** Complications

Complication	n (%)
Intraoperative	0 (0)
Recurrent instability	3 (8.8)
Dislocation	1 (2.9)
Subluxation	2 (5.9)
Revision surgeries	0 (0)

reported outcomes, high satisfaction, and high return to sports rates, whereas the rate of recurrent instability, revision surgery, and complications was low.

Up to a third of patients undergoing arthroscopic Bankart repair have been found to have experienced recurrent instability at 10 years postoperation,<sup>11</sup> whereas it is generally assumed that females are at an even greater risk for recurrent instability following shoulder stabilization than males.<sup>4,6,14</sup> This could lead surgeons to consider indicating bony reconstruction rather than arthroscopic stabilization more widely than in males. However, Du Plessis et al<sup>4</sup> found that in female patients the complication rate following the Latarjet procedure was 34%, with 14% of patients needing revision surgery.<sup>5</sup> In light of this, the results of the present study are in contrast with the literature and suggests that good outcomes and relatively low recurrence rates can be achieved in an athletic female population with arthroscopic Bankart repair.

Our study found a mean Beighton score of 3, with a score of ≥4 indicative of generalized joint hypermobility. It is debated whether the Beighton Score is suitable to predict shoulder hypermobility and instability risk, with some showing evidence that there is a correlation and others refuting this theory.<sup>1,2,19</sup> It is generally accepted that females have a higher incidence of hypermobility than males, which has been described as a risk factor for anterior shoulder instability.<sup>3,16</sup> As we found a low recurrent instability rate in active women, which is comparable to that of the active male population in our series, it seems that gender-related, physiologically increased joint laxity might not be an independent risk factor for recurrent glenohumeral instability.

The overall rate of return to sport was good in our series. Similarly, Memon et al<sup>9</sup> in a systematic review found rates of 81% following arthroscopic Bankart repair for anterior shoulder instability, although this study and the literature as a whole is composed primarily of male

**Table IV** Range of motion asymmetry

Complication	n (%)
Forward flexion	10 (29.4)
Abduction	10 (29.4)
External rotation	8 (23.5)
Internal rotation	19 (55.9)

patients. However, in contrast, DuPleiss et al<sup>4</sup> found that only 38% of female athletes returned following the Latarjet procedure, with Hurley et al<sup>7</sup> finding in a systematic review that 89% were able to return. Warth et al<sup>18</sup> determined that the ability to return to sport is the most significant factor for patients choosing to undergo arthroscopic Bankart repair for anterior shoulder instability. Of the patients who were able to return to play, 86% reported they were satisfied/very satisfied with the procedure compared with 57% of patients who did not return to play, with both of the patients who reported overall dissatisfaction with the procedure being in the “did not return to play” group. This trend in the satisfaction levels shows the importance of returning to play as an aspect of a patient’s overall experience with the surgery and correlates with Warth et al’s findings.<sup>18</sup>

Our study found that the majority of patients had good patient-reported outcomes such as daily pain levels. The functional impairment of note in our series was some minor loss in range of motion in all planes, particularly internal rotation, and our patients reported a slightly lower Rowe score than those reported in a meta-analysis by Petrer et al<sup>15</sup>; this may be due to the amount of competitive athletes returning to play in this population. Our study found that patients have low levels of residual pain on a daily basis. Despite this, a large proportion of our patients felt they had to avoid sleeping in certain positions because of their shoulder. Postoperative sleep disturbances produce a harmful effect in patients, including a higher sensitivity to pain and poorer recovery.<sup>17</sup> However, evidently this is tolerated as the majority of our patients were satisfied with the procedure and would undergo it again.

## Limitations

This study had several limitations and sources of potential bias. The primary limitation of the study was that it was retrospective in nature, and patients did not have preoperative outcome scores. Additionally, there was no comparative group as all patients received operative management and there was no nonsurgical intervention group. There was inconsistency in patients being athletes or nonathletes, and within the athlete group there was variation in the degree of sporting involvement from recreational to professional.

## Conclusion

Female patients with anterior shoulder instability treated with arthroscopic Bankart repair have low recurrence rates, with good patient-reported outcomes and high satisfaction rates. Of those participating in sport prior to surgery, there was a high rate of return to play. The

overall rate of complications was low, with a low rate of revision surgery.

## Disclaimer

The authors, their immediate families, and any research foundations with which they are affiliated have not received any financial payments or other benefits from any commercial entity related to the subject of this article.

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