Recurrent Instability Following Arthroscopic Bankart Repair Predicts Patient Acceptable Symptom State for Patient Reported Outcomes

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INTRODUCTION: Several studies have investigated pre-operative factors associated with risk of recurrent instability following arthroscopic Bankart repair (ABR). Additionally, a previous study has established the Patient Acceptable Symptom State (PASS) for the Western Ontario Shoulder Index (WOSI) and pain Visual Analog Score (pVAS) following ABR. To our knowledge no study has explored the effect of preoperative factors as well as recurrent instability on achieving Patient Acceptable Symptom State (PASS) for Patient Reported Outcomes (PROs) after ABR. We hypothesize that certain factors will have significant associations with PASS for both WOSI and pVAS.

METHODS: This study's methodology was approved by an institutional review board (University of Pittsburgh, No. STUDY20030061). Prospectively collected data was retrospectively reviewed for consecutive patients aged 14-40 that underwent primary ABR for anterior glenohumeral instability between 2007 and 2023. Patients were excluded if they had less than 2 years follow-up, >25% glenoid bone loss, an "off-track" lesion, a concomitant rotator cuff tear or glenoid fracture, and if their surgery was a revision. WOSI and pVAS were collected at final follow up. The Fisher exact, chi-square, and Student's T tests were used to analyze differences in PASS. A moderator analysis was conducted with respect to recurrent instability to determine whether any moderating variables exist.

RESULTS SECTION: A total of 95 patients were included for analysis with an average age of 23.04 years and an average follow up of 8.4 years or 101.01 months (35-161 months) and 66 (69%) of patients were male. Of the 95 patients included, 75% (71/95) and 65% (62/95) achieved PASS for WOSI and pVAS respectively. Decreased number of anchors used (p=0.04) and recurrent instability (p<0.01) were predictors of patients not achieving PASS for WOSI. Additionally, decreased Hill Sachs length (p=0.03) and recurrent instability (p<0.01) were predictors of patients not achieving PASS for pVAS. With respect to recurrent instability there were no moderating variables found for WOSI or pVAS.

DISCUSSION: The primary finding of this study is that patients who experience recurrent instability at long-term follow up are significantly less likely to achieve PASS for WOSI and VAS. This partially supports our hypothesis as all other investigated variables were found to have no significant effects. The primary limitation of this study is that it is a retrospective cohort from a singular institution, as a result the cohort use is subject to selection bias limiting the generalizability of the study's findings.

CLINICAL RELEVANCE: The findings of this study have important implications for postoperative care and expectations for ABR, suggesting surgical algorithms aimed at mitigating the risk of recurrence may also have the added benefits of optimizing subjective outcomes.

Table 1. Comparison of Patients Achieving PASS for WOSI and pVAS after Arthroscopic Bankart Repair

	WOSI PASS Achieved (n=71)	WOSI PASS Not Achieved (n=24)	P-Value
Age (years)	23.85 +/- 8.12	21.26 +/- 8.50	0.19
Sex (female)	20 (28.17)	9 (37.5)	0.39
Contact Athlete	29 (40.85)	15 (62.5)	0.06
Glenoid Diameter	28.47 +/- 3.12	28.01 +/- 3.12	0.53
% GBL	6.85 +/- 7.59	5.38 +/- 7.40	0.41
HS Length (mm)	8.36 +/- 5.60	6.87 +/- 5.82	0.27
DTD (mm)	13.26 +/- 6.43	14.76 +/- 6.67	0.33
Near Track Lesion	23 (32.39)	8 (33.33)	0.93
>1 Pre-Operative Instability Episode	38 (53.52)	16 (66.67)	0.26
Hyperlaxity	8 (11.27)	4 (16.67)	0.49
Number of Anchors	4.65 +/- 1.76	3.83 +/- 1.37	0.04
Recurrent Instability	6 (8.45)	12 (50)	<0.01
	pVAS PASS Achieved (n=62)	**pVAS PASS Not Achieved (n=33)**	**P-Value**
Age (years)	24.01 +/- 8.14	21.33 +/- 8.46	0.14
Sex (female)	16 (25.81)	13 (39.39)	0.17
Contact Athlete	26 (41.94)	18 (54.55)	0.24
Glenoid Diameter	28.64 +/- 3.08	27.60 +/- 3.19	0.12
% GBL	6.50 +/- 7.62	6.25 +/- 7.56	0.88
DTD (mm)	13.01 +/- 6.31	15.02 +/- 6.77	0.15
Near Track Lesion	22 (35.48)	9 (27.27)	0.42
>1 Pre-Operative Instability Episode	34 (54.84)	18 (54.55)	0.98
Hyperlaxity	6 (9.67)	5 (15.15)	0.51
Number of Anchors	4.39 +/- 1.60	4.30 +/- 1.63	0.81
Recurrent Instability	6 (9.68)	12 (36.36)	<0.01

Data are reported as percentage n (%) or mean +/- standard deviation. Boldface P-values indicate a statistically significant difference (P<0.05). GBL = Glenoid Bone Loss; HS = Hill-Sachs; DTD = Distance to Dislocation; SSV = Subjective Shoulder Value; WOSI = Western Orthopaedic Shoulder Index.

Table 2. Moderator Analysis for Recurrent Instability with WOSI PASS and pVAS PASS

WOSI and Recurrent Instability	Odds Ratio	Standard Error	P-Value
Age (years)	0.94	0.10	0.56
Contact Athlete	2.85	1.43	0.46
Anchors	2.84	0.69	0.13
pVAS and Recurrent Instability	**Odds Ratio**	**Standard Error**	**P-Value**
Age (years)	0.94	0.10	0.50
Sex (female)	4.09	1.22	0.25
HS Length	1.13	0.15	0.42
DTD	0.89	0.12	0.32

Boldface P-values indicate a statistically significant difference (P<0.05). HS = Hill-Sachs; DTD = Distance to Dislocation; WOSI = Western Orthopaedic Shoulder Index; pVAS = pain Visual Analog Scale