

Glenoid Labrum Tear Size is not Related to the Number of Preoperative Dislocations nor Time from Injury to Surgery in Patients Receiving Arthroscopic Anterior and Posterior Labral Repairs

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INTRODUCTION:

Shoulder instability is a common musculoskeletal complaint with an estimated incidence of 23.9 per 100,000 person-years. Injury patterns and patient demographics substantially influence operative planning and serve as predictors of recurrent instability. Some studies have demonstrated BMI and contact sports as significant risk factors for larger (>270°) labral tears. However, the predicting labral tear size is not always correlative with clinical and radiographic variables. The objective of this study was to evaluate trends in labral tear size by injury pattern, demographics, and surgical procedure in a diverse population of patients who have received arthroscopic labral repairs for anterior and posterior shoulder instability.

METHODS:

A retrospective chart review was performed for consecutive patients who underwent primary arthroscopic labral repair surgery for anterior and posterior shoulder instability with a minimum 2-year follow up. Surgeries were performed by six surgeons at a single institution between 2012-2020. Patients with prior shoulder instability surgeries of any kind were excluded. Demographics and operative variables included sex, body mass index (BMI), Contact/collision sports, tobacco use, ASA grade, number of dislocations (<1, 1, 2, >2), tear size (120, 240, and 360 degrees), age, time from first dislocation to surgery, number of anchors, and concomitant procedures (Table 1 and Table 2). Labral tear size was categorized into three groups: 120 degrees, 240 degrees, and 360 degrees with anterior, posterior, and superior labrums assumed to occupy each arc respectively. Size was confirmed per operative reports. Groups were then compared using student's t-tests and Mann-Whitney U test for continuous variables and Chi-Square or Fisher's Exact tests for discrete variables with a significance of 0.05.

RESULTS:

The number of anchors used was the only variable found to correlate with tear size ($p < 0.001$). There was no statistical difference between tear size groups and patient demographics including male sex, contact sport participation, tobacco use, anterior instability, BMI, CCI, ASA, age at surgery, or association of concomitant procedures. All tear size groups had a higher percentage of patients with >2 dislocations as opposed to <1, 1, or 2 dislocations (120=48.6%, 240=40.4%, 360=83.3%) but these findings were not statistically significant ($p=0.067$). Time from first dislocation to surgery (in months) was not a predictor of surgery (120=44.9, 240=36.4, 360=30.1).

DISCUSSION AND CONCLUSION: The most significant finding in this study was that glenoid labrum tear size did not demonstrate any correlation to the number of preoperative dislocations in patients receiving arthroscopic labral repair for anterior or posterior instability. Furthermore, time from first dislocation to surgery, participation in a contact sport, and BMI did not correlate with tear size as previous literature has suggested. None of the other clinical or demographic variables predicted tear size other than the number of anchors used, which is intuitive. Previous research has shown that bone loss worsens with anterior instability and increased dislocation numbers and preoperative clinical discussion and perioperative planning should revolve around this concept. However, when counseling patients on the risk of tear size progression, our data would suggest that patients with increasing numbers of instability events or delaying time from injury to surgery will not impact the likelihood of a larger tear evolving. Thus, tear size is likely a result of the initial injury insult.



	120°	240°	360°	P-value
Patient Demographics				
Male	73.1% (302/413)	80.0% (84/105)	83.3% (5/6)	0.31
Contact/collision athlete	32.9% (136/413)	33.3% (35/105)	33.3% (2/6)	1.00
Tobacco use	12.6% (52/413)	9.5% (10/105)	0%	0.46
Anterior instability	77% (318/413)	81.9% (86/105)	100% (6/6)	
Posterior instability	33% (95/413)	18.1% (19/105)	0%	0.24
Primary surgery (vs. revision)	87.9% (363/413)	94.3% (99)	100% (6/6)	0.12
Number of prior dislocations				
< 1	6.2% (25/401)	4.8% (5/104)	0%	0.71
1	19.7% (79/410)	26% (27/104)	16.7% (1/6)	0.36
2	12.5% (50/401)	9.6% (10/104)	0%	0.48
> 2	48.6% (195/401)	40.4% (42/104)	83.3% (5/6)	0.07
Concomitant operative procedures				
Remplissage	14.5% (60/413)	7.6% (8/105)	33.3% (2/6)	0.063
Capsular plication	20.6% (85/413)	25.7% (27/105)	0%	0.227
Rotator interval closure	1.2% (5/413)	19% (2/105)	0%	0.824
Bicep tenodesis	8.7% (36/413)	7.6% (8/105)	0%	0.709
Distal clavicle excision	2.4% (10/413)	1.0% (1/105)	0%	0.604
Subacromial decompression	2.7% (11/313)	1.0% (1/105)	0%	0.539
Rotator cuff repair	3.4% (14/413)	1.9% (2/105)	16.7% (1/6)	0.131
HAGL repair	1.2% (5/413)	3.8% (4/105)	0%	0.178

Table 1: Comparison of tear sizes: demographic and operative variables

	Size of tears			P-value
	120°	240°	360°	
BMI	26.49 ± 5.42	27.13 ± 6.24	25.52 ± 3.45	0.515
CCI	0.14 ± 0.63	0.06 ± 0.23	0 ± 0	0.361
ASA	1.36 ± 0.55	1.38 ± 0.6	1.17 ± 0.41	0.649
Age at surgery	27.02 ± 10.06	27.15 ± 9.06	30.09 ± 11.73	0.750
Time from first dislocation to surgery (months)	44.90 ± 66.17	36.36 ± 55.53	23 ± 31.6	0.462
Number of anchors used	3.63 ± 1.25	4.64 ± 1.42	5.67 ± 2.16	<.001

Table 2: Demographics by tear size (displayed as mean ± standard deviation)

