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## ORIGINAL ARTICLE

# Arthroscopic treatment of posterior shoulder instability in patients with and without glenoid dysplasia: a comparative outcomes analysis

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**Background:** The purpose of this study was to evaluate the influence of glenoid dysplasia on outcomes after isolated arthroscopic posterior labral repair in a young military population.

**Methods:** Thirty-seven male patients who underwent arthroscopic posterior labral repair for symptomatic posterior shoulder instability were evaluated at a mean duration of 3.1 years. A comparative analysis was performed for those with glenoid dysplasia and without dysplasia. Additional factors analyzed included military occupational specialty (MOS), preoperative mental health clinical encounters and mental health medication use, and radiographic characteristics (version, posterior humeral head subluxation, and posterior capsular area) on a preoperative standard shoulder magnetic resonance arthrogram. The groups were analyzed with regard to shoulder outcome scores (subjective shoulder value [SSV], American Shoulder and Elbow Surgeons [ASES] rating scale, Western Ontario Shoulder Instability Index [WOSI]), need for revision surgery, and medical separation from the military.

**Results:** Of 37 patients, 3 (8.1%) underwent revision surgery and 6 (16%) underwent medical separation. Overall outcome assessment demonstrated a mean SSV of 67.9 (range, 25-100) ± 22.1, mean ASES of 65.6 (range, 15-100) ± 22, and mean WOSI of 822.6 (range, 5-1854) ± 538. There were no significant differences in clinical outcome scores between the glenoid dysplasia and no dysplasia groups (SSV,  $P = .55$ ; ASES,  $P = .57$ ; WOSI,  $P = .56$ ). MOS ( $P = .02$ ) and a history of mental health encounters ( $P = .04$ ) were significantly associated with diminished outcomes.

**Conclusions:** The presence or absence of glenoid dysplasia did not influence the outcome after arthroscopic posterior labral repair in a young military population. However, a history of mental health clinical encounters and an infantry MOS were significantly associated with poorer clinical outcomes.

Madigan Army Medical Center Department of Clinical Investigation approved this study: Reference No. 216033.

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**Level of evidence:** Level III; Retrospective Cohort Design; Treatment Study

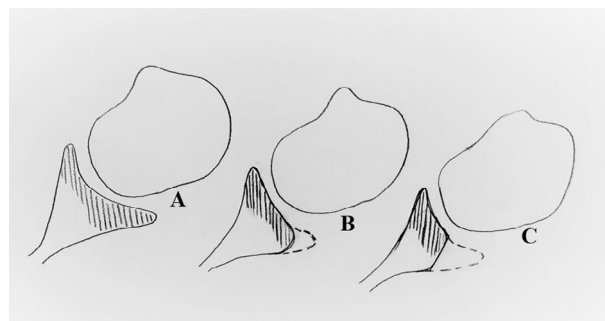
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**Keywords:** Shoulder instability; posterior instability; arthroscopy; glenoid dysplasia; labral tear; retroversion

Arthroscopic posterior labral repair is recognized as a successful treatment option for symptomatic posterior shoulder instability. Several case series document uniformly good to excellent outcomes for suture anchor–based arthroscopic repairs.<sup>2,4-6,17,23,26</sup> However, as posterior instability is becoming more commonly recognized and diagnosed as a variation in the etiology of pathologic processes such as glenoid dysplasia, increased glenoid retroversion and increased capsular volume are also being recognized as risk factors for development of symptomatic posterior instability.<sup>3,9,12,20,28</sup> The influence of these variables on outcomes after arthroscopic posterior labral repair is unknown. There is a paucity of evidence evaluating the outcomes of arthroscopic posterior labral repair in a cohort of patients with glenoid dysplasia. The purpose of this study was to evaluate the influence of glenoid dysplasia on outcomes after isolated arthroscopic posterior labral repair in a young military population. We hypothesized that the presence of glenoid dysplasia would result in no significant difference in outcome scores for patients undergoing arthroscopic posterior labral repairs. In addition, we sought to identify radiographic and preoperative factors associated with poor outcomes in a young military population.

## Methods

We performed a retrospective analysis of all 46 male active duty patients presenting to our academic institution from January 2010 to January 2014 who underwent arthroscopic posterior labral repair for an arthroscopically confirmed isolated posterior labral tear for symptomatic posterior shoulder instability. Thirty-seven patients (80.4% follow-up) were available for review at a mean of 3.1 years (range, 2.0-6.4 years) postoperatively. Mean age was 28 years (20-44) ± 5 years (Table I). All arthroscopic procedures were performed at 1 military treatment facility, which is a high-volume center with approximately 350 arthroscopic shoulder procedures performed per year. The 5 orthopedic surgeons involved are experienced arthroscopists, with 35% of their shoulder practice composed of shoulder instability cases. We divided the patients into 2 comparison groups:



**Figure 1** The classification by Weishaupt et al<sup>29</sup> for glenoid dysplasia. (A) The “pointed” normal morphologic appearance. (B and C) The “lazy-J” and “delta” dysplastic morphologic features, respectively.

those with (group 1) and without (group 2) glenoid dysplasia. The presence of glenoid dysplasia was determined and classified according to the methods described by Weishaupt et al.<sup>29</sup> In this classification, the anatomic form of the posteroinferior glenoid is qualitatively assessed on the most caudal axial magnetic resonance arthrography (MRA) image that still unequivocally represents the glenoid articular cartilage. In addition, “pointed” is used to describe a normal morphologic appearance of the posteroinferior glenoid. “Lazy-J” and “delta” describe the morphologic features of a dysplastic posteroinferior glenoid (Fig. 1). Glenoid dysplasia measurements were performed by 2 orthopedic surgeons, and interobserver reliability, as determined by the  $\kappa$  value, was good ( $\kappa = 0.64$ ). We reviewed operative reports, arthroscopic images, and electronic medical records to define the primary diagnosis, procedure performed, and operative findings. Additional patient data collected included age, laterality, history of a traumatic instability event, military occupational specialty (MOS), prior treatments, number and type of suture anchors, and coexistent disease. We also documented the presence or absence of mental health clinical encounters and medications in the patient’s military electronic medical record. Inclusion criteria were active duty military who underwent isolated arthroscopic posterior labral repair, age 18-45 years, minimum of 24 months of follow-up, and receipt of preoperative standard-

**Table I** Study demographics

	Glenoid dysplasia group (N = 18)	No glenoid dysplasia group (N = 19)	P value
Age (y), mean (range)	28 (20-44)	28.7 (20-38)	.44
Sex, male:female	18:0	19:0	.99
Affected side, left:right	8:10	11:8	.39
Instability type, traumatic:atraumatic	10:8	11:8	.58
No. of suture anchors, mean	2.5	2.5	.99
Follow-up (y), mean (range)	3.6 (2.0-6.4)	3.1 (2.0-4.7)	.008*

\*  $P < .05$ , statistically significant difference between glenoid dysplasia group and no glenoid dysplasia group.

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