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# Do accompanying glenohumeral joint pathologies affect the clinical outcomes of arthroscopic rotator cuff repair surgery?

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## MAIN POINTS

- Orthopedic surgeons commonly encounter rotator cuff tears.
- Accompanying glenohumeral joint pathologies significantly affect the clinical outcomes of arthroscopic rotator cuff repair.
- Patients with biceps tendinopathy have worse shoulder flexion, internal rotation, and ASES scores both before and after rotator cuff repair.

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## ABSTRACT

**Aim:** To compare the clinical outcomes of arthroscopic rotator cuff repairs in patients with or without concomitant glenohumeral joint lesions.

**Materials and Methods:** Patients with a confirmed diagnosis of rotator cuff tear who underwent arthroscopic repair were included in this retrospective comparative study. Patients were grouped according to the presence of accompanying glenohumeral joint pathology identified during arthroscopic surgery. Demographic, clinical, and operative data were recorded for all patients. Physical examination findings and clinical scores were recorded for all patients at initial admission and at the 6-month postoperative follow-up examination.

**Results:** Group I included 61 patients (with accompanying glenohumeral pathologies) and Group II included 32 patients (with no glenohumeral pathology). The mean shoulder flexion of patients in Group II was significantly higher than that in Group I at both preoperative and postoperative 6 months of follow-up examinations (p=.015 and .001, respectively). The mean internal rotation of the shoulder in Group II was also significantly higher than that in Group I preoperatively and at 6 months postoperatively follow-up examinations (p=.029 and .038, respectively). The mean ASES score of patients in Group II was significantly higher preoperatively and at 6 months postoperatively than that in Group I (p=.002 and .020, respectively).

**Conclusion:** Among patients who underwent rotator cuff repair, those with accompanying glenohumeral joint pathologies had significantly lower shoulder flexion, internal rotation, and ASES scores than those without such pathologies.

**Keywords:** Shoulder arthroscopy, Rotator cuff tear, Clinical outcomes, Biceps tendinopathy, Glenohumeral arthritis, SLAP lesion

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## INTRODUCTION

Rotator cuff tears are commonly encountered by orthopedic surgeons due to increased activity among older adults and increased life expectancy. Currently, open, mini-open, and arthroscopic surgical methods are used for the surgical treatment of rotator cuff tears [1-3]. Just as rotator cuff tears may be observed on their own, they may also be detected with other glenohumeral joint pathologies such as biceps tendinosis, glenohumeral arthrosis, superior labral anterior posterior (SLAP) tears, and anterior labrum tears [4-8]. Gartsman reported that 68% of 200 patients with full-layer rotator cuff tears had glenohumeral joint pathology and mentioned that 12.5% of these were major abnormalities such as glenohumeral osteoarthritis, labral tears, and biceps tendon tears [6,9].

Determining whether the presence of this pathology influences the clinical results of patients undergoing arthroscopic rotator cuff repair is of considerable importance [6]. Existing literature contains only a small number of studies examining how glenohumeral joint pathologies—identified intraoperatively during arthroscopic procedures—impact the clinical outcomes of patients undergoing arthroscopic rotator cuff repair [8-10]. We hypothesized that patients with concomitant glenohumeral joint pathologies would have worse clinical outcomes than those without such pathologies. Accordingly, this study sought to compare the clinical outcomes of patients un-

dergoing arthroscopic rotator cuff repair, distinguishing between those with concomitant glenohumeral joint abnormalities and those without such lesions.

## MATERIALS AND METHODS

### *Study population*

This retrospective case-control study received approval from the Erzincan University Clinical Research Ethics Committee (Decision no: 18/02, Date: 09.01.2018) and was carried out in compliance with the principles of the Declaration of Helsinki. Patients who had a rotator cuff tear verified by clinical and radiologic assessment and underwent arthroscopic repair between January 2014 and December 2017 were included.

Patients with incomplete medical records, a history of fracture or surgery on the affected side, or those lost to follow-up were excluded. A total of 93 patients who underwent arthroscopic rotator cuff repair surgery were evaluated in this study. All patients were informed about surgery and they signed consent form before surgery. Patients were grouped according to the presence of accompanying glenohumeral joint pathology identified during arthroscopic surgery. Additional glenohumeral joint pathologies were observed in 61 of 93 patients (Group I). Patients with no accompanying glenohumeral joint pathologies comprised Group II.

### *Surgical technique*

The surgeries were performed with patients positioned either in the beach-chair or lateral decubitus position and anesthetized with general anesthesia or a regional nerve block. Double-row repair was performed for supraspinatus tears, and single-row repair was performed for subscapularis tears. The shoulder was immobilized for 6 weeks using an anti-rotation shoulder sling. A standardized rehabilitation program was performed for all patients, consisting of pendulum exercises and passive movements for the first 6 weeks, followed by muscle strengthening beginning 6 weeks postoperatively.

### *Data collection*

At the time of initial presentation, data were collected on each patient's age, sex, body mass index, dominant and affected sides, smoking habits, duration of symptoms (months), and the underlying cause of the tear.

Subacromial interval distance (mm), acromion–glenoid angle, and supraspinatus–glenoid angle were measured by a single observer on magnetic resonance imaging (MRI) scans electronic records of our hospital. Patients' physical examination findings such as shoulder range of motion (ROM) measurement, presence of instability, and impingement were recorded for all patients at first admission and at postoperative 6 months of follow-up examination. Disability of arm and shoulder (Quick DASH) score, visual analog scale (VAS) score, and American Shoulder and Elbow Surgeons Shoulder (ASES) score were evaluated for each patient at first admission and at postoperative 6 months of follow-up. Clinical and functional outcomes were evaluated at the 6-month postoperative follow-up, which was defined as the primary endpoint of the study. Although the mean overall follow-up duration was 12.2 months (range: 6–40 months), standardized clinical assessments were consistently available at 6 months for all patients; therefore, this time point was used for comparative analysis.

### *Statistical analysis*

Statistical analyses were conducted using SPSS version 20.0 (SPSS Inc., IBM, NY, USA). Continuous variables were reported as means with standard deviations, whereas categorical variables were presented as counts and percentages. The Kolmogorov–Smirnov test was used to assess the normality of the data distribution. Mean differences were examined using the Student's t-test, and categorical comparisons were performed with Pearson's chi-square test. A p-value below 0.05 was accepted as the threshold for statistical significance. However, when the assumptions of the chi-square test were not met (i.e., when more than 20% of expected cell counts were less than 5), Fisher's exact test was used. Additionally, post hoc power calculations were carried out using the G*Power 3.0 software (Germany).

## RESULTS

Group I consisted of 61 patients (38 females, 23 males) with a mean age of 59.8 years who had accompanying glenohumeral joint pathologies. The group without accompanying glenohumeral joint pathologies (Group II) consisted of 32 patients

**Table 1.** The demographic data of the patients.

| | Group I (n=61) | Group II (n=32) | P values |
|---|---|---|---|
| Gender | | | .823 |
| Female | 38 (62.3%) | 21 (65.6%) | |
| Male | 23 (37.7%) | 11 (34.4%) | |
| Age (years) | 59.8 ± 9.2 | 54.1 ± 10.4 | **.009** |
| Body mass index(kg/m$^2$) | 24.5 ± 1.9 | 24.1 ± 1.9 | .367 |
| Dominant hand | | | |
| Right | 51 (83.6%) | 30 (93.75%) | |
| Left | 10 16.4%) | 2 (6.25%) | |
| Affected side | | | .224 |
| Right | 41 (67.2%) | 26 (81.25%) | |
| Left | 20 (32.8%) | 6 (18.75%) | |
| Smoking | | | .743 |
| Yes | 8 (13.1%) | 3 (9.4%) | |
| No | 53 (86.9%) | 29 (90.6%) | |
| Duration of symptoms (months) | 10.3 ± 4.1 | 8.8 ± 3.7 | .091 |
| Etiology | | | .192 |
| Traumatic | 25 (41%) | 18 (56.25%) | |
| Degenerative | 36 (59%) | 14 (43.75%) | |

n: number. Bold p value indicate statistically significance.


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**Table 2.** Preoperative Magnetic Resonance Imaging (MRI) findings of the patients.

| | Group I (n=61) | Group II (n=32) | P values |
|---|---|---|---|
| Subacromial interval distance (mm) | | | |
| Coronal | 6.1 ± 0.7 | 6 ± 0.8 | .327 |
| Sagittal | 6.2 ± 0.7 | 6 ± 0.8 | .324 |
| Acromion-Glenoid angle (degree) | 85 ± 1 | 84.9 ± 1 | .781 |
| Supraspinatus-Glenoid angle (degree) | 84.8 ± 0.6 | 84.6 ± 0.9 | .288 |
| Tendon Tear | | | .513 |
| Supraspinatus | 44 (72.1%) | 25 (78.1%) | |
| Subscapularis | 0 | 1 (3.1%) | |
| Supraspinatus+Subscapularis | 17 (27.9%) | 6 (18.8%) | |
| Tear Type | | | .623 |
| Partial | 44 (72.1%) | 25 (78.1%) | |
| Full-Thickness | 17 (27.9%) | 7 (21.9%) | |
| Tear Side | | | .865 |
| Bursal | 8 (13.1%) | 5 (15.6%) | |
| Articular | 48 (78.7%) | 23 (71.9%) | |
| Intratendinosus | 5 (8.2%) | 4 (12.5%) | |

n: number.

**Table 3.** Surgical procedure data of the groups.

| | Group I (n=61) | Group II (n=32) | P values |
|---|---|---|---|
| Anesthesia Type | | | .932 |
| General Anesthesia | 50 (82%) | 26 (81.25%) | |
| Regional Anesthesia | 11 (18%) | 6 (18.75%) | |
| Patient Position | | | .549 |
| Beach Chair | 3 (4.9%) | 0 | |
| Lateral Decubitis | 58 (95.1%) | 32 (100%) | |
| Repaired Tendon | | | .717 |
| Supraspinatus | 43 (70.5%) | 25 (78.1%) | |
| Subscapularis | 2 (3.3%) | 1 (3.1%) | |
| Supraspinatus+Subscapularis | 16 (26.2%) | 6 (18.8%) | |
| Biceps Tenotomy | | | **< .001** |
| + | 43 (70.5%) | 0 | |
| - | 18 (29.5%) | 32 (100%) | |
| Acromioplasty | | | .889 |
| + | 43 (70.5%) | 23 | |
| - | 18 (29.5%) | 9 | |
| SLAP Repair | | | .09 |
| + | 6 (9.8%) | 0 | |
| - | 55 (90.2%) | 32 (100%) | |
| Labrum Repair | | | .161 |
| + | 5 (8.2%) | 0 | |
| - | 56 (91.8%) | 32 (100%) | |
| Glenohumeral Arthrosis | | | **.007** |
| + | 12 (19.7%) | 0 | |
| - | 49 (80.3%) | 32 (100%) | |

n: number. Bold p value indicate statistically significance.

(21 females, 11 males) with a mean age of 54.1 years. The demographic data of the groups are presented in Table 1.

The mean age of patients in Group I was significantly higher than that in Group II (p=.009) (Table 1). There were no statistically significant differences between the two groups regarding preoperative MRI measurements or imaging findings (Table 2). Of the 93 patients, 68 (73%) underwent supraspinatus repair, 3 (3%) underwent subscapularis repair, and 22 (24%) underwent both supraspinatus and subscapularis repair. Arthroscopic acromioplasty was performed on 66 patients (71%) for extrinsic compression identified during surgery. We observed biceps tendinopathy in 50 patients, glenohumeral osteoarthritis in 12 patients, SLAP tears, and anterior labral tears. Biceps tenodesis or tenotomy was performed in cases in which the long head of the biceps tendon demonstrated degenerative tendinopathy. SLAP tear repair was performed in 6 patients (6%), whereas anterior labrum repair was performed in 5 patients (5%) (Table 3).

The mean shoulder flexion of patients in Group II was significantly higher than that of Group I at both the preoperative and the 6-month postoperative follow-up examinations (p=.015 and .001, respectively). The mean internal rotation of shoulder in Group II was also significantly higher than that in Group I at preoperative and postoperative 6 months of follow-up examinations (p= .029 and .038, respectively) (Table 4). VAS, ASES, and QuickDASH functional scores were evaluated both before surgery and at the 6-month postoperative follow-up. The mean ASES scores differed significantly between the two groups when evaluated preoperatively and at the 6-month postoperative follow-up. The mean ASES score of patients in Group II was significantly higher than in Group I both preoperatively and at the 6-month postoperative follow-up (p=.002 and .020, respectively) (Table 5).

## DISCUSSION

The most important outcome of this study was the observation that concomitant glenohumeral joint pathologies significantly affected the clinical outcomes of patients undergoing arthroscopic rotator cuff repair. As previously reported in the


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**Table 4.** Preoperative and postoperative 6-months shoulder range of motion (ROM) of the groups.

| | Group I (n=61) | Group II (n=32) | P values |
|---|---|---|---|
| Preoperative ROM (degrees) | | | |
| Flexion | 141.4 ± 9.6 | 147.5 ± 13.4 | **.015** |
| Internal rotation | 42.9 ± 8.6 | 47.8 ± 12.3 | **.029** |
| External rotation | 53.9 ± 11.1 | 58.4 ± 15.6 | .112 |
| Abduction | 80.1 ± 12.3 | 85 ± 17.4 | .124 |
| Postoperative 6-months ROM (degrees) | | | |
| Flexion | 152.7 ± 7.3 | 158.7 ± 8.7 | **.001** |
| Internal rotation | 58.5 ± 6.7 | 61.5 ± 6.2 | **.038** |
| External rotation | 68 ± 10.1 | 68.7 ± 11.8 | .761 |
| Abduction | 112.7 ± 14 | 117.8 ± 15.8 | .120 |

n: number. Bold p value indicate statistically significance.

**Table 5.** Preoperative and postoperative 6-months follow-up clinical scores of the patients.

| | Group I (n=61) | Group II (n=32) | P values |
|---|---|---|---|
| Visual Analog Scale | | | |
| Preoperative | 7.2 ± 0.5 | 7 ± 0.5 | .318 |
| Postoperative | 1.4 ± 0.4 | 1.2 ± 0.4 | .096 |
| Quick DASH score | | | |
| Preoperative | 58.7 ± 6 | 58.1 ± 4.1 | .632 |
| Postoperative | 21.4 ± 2.3 | 20.9 ± 3.2 | .392 |
| ASES score | | | |
| Preoperative | 21 ± 1.6 | 22.4 ± 2.4 | **.002** |
| Postoperative | 37.9 ± 2.5 | 39.2 ± 2.6 | **.020** |

n: number, DASH: Disabilities of Arm, Shoulder and Hand, ASES: American Shoulder and Elbow Surgeons bold p values indicate statistically significance.

literature, accompanying glenohumeral joint pathologies that were not identified at preoperative radiological assessment but identified during arthroscopic rotator cuff repair may have a negative impact on the clinical outcomes in the postoperative period [11-14]. Miller and Savoie [10] documented that 74% of patients presenting with full-thickness rotator cuff tears had associated glenohumeral joint pathologies. Other studies in the literature have reported similar rates of accompanying glenohumeral joint pathologies accompanying rotator cuff tears [6, 15-19]. Forsythe et al. [5] compared 28 patients with isolated rotator cuff tear and 34 patients with accompanying SLAP lesion. Their outcomes revealed that shoulder range of motion did not differ significantly between the groups [5].

According to their results, the ASES score in the preoperative period was found to be

statistically significantly low in patients with an accompanying SLAP lesion; whereas, no

statistically significant difference was identified in the ASES score in the postoperative period [5]. Authors reported that patients with an accompanying SLAP lesion to rotator cuff tear had no statistically significant differences in the preoperative Constant score; however, in the postoperative period, the Constant score for these patients was found to be statistically significantly high [5].

A study by Franceschi et al. [20] compared 31 patients with additional SLAP lesion repair and 32 patients with additional biceps long-head tenotomy. The authors reported that patients with biceps tenotomy had better UCLA score and shoulder ROM [20]. In literature, SLAP lesion was frequently associated with rotator cuff tears and mentioned that this lesion is commonly missed [21,22]. Abbot et al. [4] compared patients with an additional SLAP lesion or biceps long-head tenotomy who underwent rotator cuff repair. Authors reported that the UCLA score of biceps tenotomy was found to be significantly higher due to increased functional activity and reduced pain relief than the UCLA score of patients with SLAP repair [4]. In addition, the authors found that patients with biceps long-head tenotomy had better shoulder internal rotation and external rotation [4].

Our study group, which presented with accompanying glenohumeral joint pathologies, mostly consisted of patients with biceps tendinopathy, and our results demonstrated that these patients had worse preoperative and postoperative outcomes in shoulder flexion, internal rotation, and ASES score. The observed differences in internal rotation and flexion may be explained by the high prevalence of biceps tendinopathy in the concomitant pathology group. The long head of the biceps plays a role in shoulder stabilization and kinematics, and its pathology may contribute to altered glenohumeral mechanics. Additionally, associated intra-articular pathologies may lead to pain-related limitation of motion and capsular stiffness, which could explain deficits in internal rotation. Although limitation of internal rotation is not typically expected in SLAP lesions, altered labral function and associated pain may indirectly affect shoulder biomechanics and lead to functional restrictions.

The main limitation of this study was its retrospective design. The results of this study reflect early postoperative out-


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comes, as the primary evaluation time point was 6 months. Longer-term functional outcomes may differ and should be evaluated in future studies. Another important consideration is the presence of glenohumeral osteoarthritis in a subset of patients. Unlike in other concomitant pathologies such as SLAP lesions or biceps tendinopathy, no additional surgical intervention was performed specifically for osteoarthritis. This may have influenced both pain and functional outcomes, particularly the range of motion. Therefore, the inclusion of these patients may be a confounding factor.

Nonetheless, all patients were managed at a single center and followed prospectively using a standardized treatment protocol, which helped reduce variability. Moreover, the retrospective design of this study prevents potential patient selection bias. Second, our study included patients with partial- or full-thickness tears, which may have affected the clinical outcomes. Although previous studies have evaluated the outcomes of rotator cuff repair in the presence of concomitant pathologies, heterogeneity in study designs and patient populations limits direct comparison. This study compares the clinical outcomes of arthroscopic rotator cuff repair in patients presenting with concomitant glenohumeral joint pathologies and those without such lesions.

In addition, a post hoc power analysis was conducted for the variables that reached statistical significance, and the minimum and maximum statistical power for comparisons of means ($\alpha = 0.05$) were 0.67 and 0.96, respectively.

## CONCLUSION

Based on the results of this study, among patients who have undergone rotator cuff repair, those with accompanying glenohumeral joint pathologies had significantly lower shoulder flexion, shoulder internal rotation, and ASES score than those without accompanying pathologies. These findings suggest that concomitant intra-articular pathologies, particularly biceps-related disorders, should be carefully evaluated and considered during surgical planning and patient counseling. Orthopedic surgeons should be aware of this condition and inform their patients about the effects of additional shoulder pathologies on the clinical outcome.

**Ethics Committee Approval:** This retrospective case-control study received approval from the Erzincan University Clinical Research Ethics Committee (Decision no: 18/02, Date: 09.01.2018).

**Informed Consent:** It was not deemed necessary due to the retrospective nature of the study.

**Peer-review:** Externally peer-reviewed.

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## REFERENCES

1. Dickinson RN, Kuhn JE. Nonoperative Treatment of Rotator Cuff Tears. *Phys Med Rehabil Clin N Am.* 2023;34(2):335-355. doi: 10.1016/j.pmr.2022.12.002.
2. Boorman RS, More KD, Hollinshead RM, et al. What happens to patients when we do not repair their cuff tears? Five-year rotator cuff quality-of-life index outcomes following nonoperative treatment of patients with full-thickness rotator cuff tears. *J Shoulder Elbow Surg.* 2018;27(3):444-448. doi: 10.1016/j.jse.2017.10.009.
3. Jeong HY, Jeon YS, Lee DK, Rhee YG. Rotator cuff tear with early osteoarthritis: how does it affect clinical outcome after large to massive rotator cuff repair? *J Shoulder Elbow Surg.* 2019;28(2):237-243. doi: 10.1016/j.jse.2018.07.022.
4. Abbot AE, Li X, Busconi BD. Arthroscopic treatment of concomitant superior labral anterior posterior (SLAP) lesions and rotator cuff tears in patients over the age of 45 years. *Am J Sports Med.* 2009;37(7):1358-1362. doi: 10.1177/0363546509331940.
5. Forsythe B, Guss D, Anthony SG, Martin SD. Concomitant arthroscopic SLAP and rotator cuff repair. *J Bone Joint Surg Am.* 2010;92(6):1362-1369. doi: 10.2106/JBJS.H.01632.
6. Gartsman GM. All arthroscopic rotator cuff repairs. *Orthop Clin North Am.* 2001;32(3):501-510. doi: 10.1016/s0030-5898(05)70219-4.
7. Strickland JP, Fleckenstein CM, Ducker A, Hasan SS. Early results of concurrent arthroscopic repair of rotator cuff and type II superior labral anterior posterior tears. *Sports Health.* 2010;2(6):503-508. doi: 10.1177/1941738110370023.
8. Voos JE, Pearle AD, Mattern CJ, et al. Outcomes of combined arthroscopic rotator cuff and labral repair. *Am J Sports Med.* 2007;35(7):1174-1179. doi: 10.1177/0363546507300062.
9. İlyas G, Egeli E. Treatment of concomitant SLAP lesion in patients aged 45 and above who underwent arthroscopic rotator cuff repair: Tenotomy versus labral repair? *Ann Med Res.* 2024;31(3):233-238. doi: 10.5455/annalsmedres.2024.01.020.
10. Miller C, Savoie FH. Glenohumeral abnormalities associated with fullthickness tears of the rotator cuff. *Orthop Rev.* 1994;23(2):159-162. PMID: 8196974.
11. Arikan E, Kaya YE, Celik M, et al. Correlation of Preoperative MRI and Shoulder-Specific Tests With Intraoperative Findings in Rotator Cuff Tears. *Cureus.* 2025;17(3):e80951. doi: 10.7759/cureus.80951.
12. Kuo TJ, Lee YH, Lin LC, et al. Global Fatty Degeneration Index on Preoperative Magnetic Resonance Imaging Predicts Early Postoperative Shoulder Stiffness at 3 Months After Primary Rotator Cuff Repair. *Arthroscopy.* 2025;41(8):2720-2727. doi: 10.1016/j.arthro.2024.12.028.
13. Malavolta EA, Assunção JH, Andrade-Silva FB, et al. Prognostic Factors for Clinical Outcomes After Arthroscopic Rotator Cuff Repair. *Orthop J Sports Med.* 2023;11(4):23259671231160738. doi: 10.1177/23259671231160738.
14. Takahashi R, Kawakami K, Harada Y, Kouzaki K, Kajita Y. Early Postoperative Stiffness After Arthroscopic Rotator Cuff Repair Correlates With Improved Tendon Healing. *Arthroscopy.* 2024;40(8):2186-2194. doi: 10.1016/j.arthro.2024.01.038.


https://doi.org/10.5455/annalsmedres.2025.12.382

15. Nam EK, Snyder SJ. The diagnosis and treatment of superior labrum, anterior and posterior (SLAP) lesions. *Am J Sports Med.* 2003;31(5):798-810. doi: 10.1177/03635465030310052901.
16. Oh JH, Kim SH, Kwak SH, Oh CH, Gong HS. Results of concomitant rotator cuff and SLAP repair are not affected by unhealed SLAP lesion. *J Shoulder Elbow Surg.* 2011;20(1):138-145. doi: 10.1016/j.jse.2010.04.003.
17. Snyder SJ, Karzel RP, Del Pizzo W, Ferkel RD, Friedman MJ. SLAP lesions of the shoulder. *Arthroscopy.* 1990;6(4):274–279. doi: 10.1016/0749-8063(90)90056-j.
18. Wright SA, Cofield RH. Management of partial-thickness rotator cuff tears. *J Shoulder Elbow Surg.* 1996;5(6):458-66. doi: 10.1016/s1058-2746(96)80018-8.
19. Wu PT, Jou IM, Yang CC, et al. The severity of the long head biceps tendinopathy in patients with chronic rotator cuff tears: macroscopic versus microscopic results. *J Shoulder Elbow Surg.* 2014;23(8):1099-1106. doi: 10.1016/j.jse.2013.11.013.
20. Franceschi F, Longo UG, Ruzzini L, et al. No advantages in repairing a type II superior labrum anterior and posterior (SLAP) lesion when associated with rotator cuff repair in patients over age 50: a randomized controlled trial. *Am J Sports Med.* 2008;36(2):247-253. doi: 10.1177/0363546507308194.
21. Steinmetz RG, Guth JJ, Matava MJ, Brophy RH, Smith MV. Return to play following nonsurgical management of superior labrum anterior-posterior tears: a systematic review. *J Shoulder Elbow Surg.* 2022;31(6):1323-1333. doi: 10.1016/j.jse.2021.12.022.
22. Frantz TL, Shacklett AG, Martin AS, et al. Biceps Tenodesis for Superior Labrum Anterior-Posterior Tear in the Overhead Athlete: A Systematic Review. *Am J Sports Med.* 2021;49(2):522-528. doi: 10.1177/0363546520921177.


https://doi.org/10.5455/annalsmedres.2025.12.382