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Clinical Outcomes of Shoulder Arthroscopy in Rtator Cuff and Labral Injuries

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KEYWORDS

Shoulder arthroscopy, rotator cuff tear, labral injury, functional outcome.

ABSTRACT:

Background: Rotator cuff and labral injuries commonly cause shoulder pain, functional limitation and reduced quality of life, often affecting working-age individuals and leading to significant occupational disability. Arthroscopic techniques have improved diagnostic accuracy and therapeutic outcomes for shoulder pathology. However, regional outcome data from South Asia are limited, especially for combined rotator cuff and labral injuries. This study evaluated the clinical outcomes of shoulder arthroscopy in patients with these injuries.

Methods: This retrospective observational study included 30 patients treated at Bangladesh Medical University from July 2023 to June 2025. Demographic characteristics, intraoperative arthroscopic findings and postoperative clinical outcomes were analyzed. Pain and shoulder function were assessed preoperatively and six months postoperatively using the Visual Analog Scale, Constant–Murley score and UCLA shoulder score. Postoperative complications and return-to-activity status were documented.

Results: Visual Analog Scale pain score significantly postoperative improved from 6.8 ± 1.1 to 2.1 ± 0.9 ($p=<0.001$). The Constant–Murley score increased from 46.3 ± 8.4 to 78.9 ± 7.6, while the UCLA shoulder score improved from 15.8 ± 3.6 to 29.1 ± 3.4 ($p=<0.001$). Excellent or good clinical outcomes were achieved in 80.0% of patients. Return to pre-injury activity was reported by 76.7% of participants. Postoperative complications were minimal, with shoulder stiffness being the most frequently observed.

Conclusion: Shoulder arthroscopy provides significant pain relief and functional improvement with acceptable complication rates. It represents an effective treatment option for rotator cuff and labral injuries in this setting.

Introduction

Shoulder pain and functional limitation are among the most common musculoskeletal complaints encountered in orthopedic practice and represent a significant cause of disability worldwide. Rotator cuff and labral injuries constitute major contributors to shoulder dysfunction across both young and middle-aged populations and frequently result in persistent pain, weakness and loss of functional capacity. These conditions often arise from traumatic events, repetitive overhead activity, or progressive degenerative processes and can substantially impair activities of daily living and occupational performance [1]. With increasing life expectancy and participation in physically demanding work, the clinical burden of shoulder pathology continues to rise.

Rotator cuff tears demonstrate wide variability in size, chronicity, tendon quality and associated muscle degeneration, all of which influence surgical planning and postoperative outcomes. Epidemiological studies indicate that the prevalence of rotator cuff pathology increases with advancing age and occupational demand, particularly among individuals engaged in manual labor [3]. Repetitive mechanical loading and delayed clinical presentation have been associated with tear progression

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and compromised tissue quality, increasing the complexity of management. These factors underscore the importance of timely diagnosis and appropriate intervention.

Labral lesions, including superior labrum anterior-posterior and Bankart tears, frequently coexist with rotator cuff injuries and contribute to pain, instability and mechanical symptoms, complicating clinical management [4]. The complexity of combined rotator cuff and labral pathology necessitates careful assessment and comprehensive treatment approaches due to the variability in labral tear patterns. Furthermore, preoperative imaging may not always accurately identify all intra-articular lesions, underscoring the importance of precise intraoperative evaluation for optimal treatment planning [5].

Advances in arthroscopic techniques have significantly transformed the diagnosis and management of shoulder pathology by enabling minimally invasive evaluation and repair, evolving from primarily diagnostic tools to comprehensive therapeutic approaches [6] Arthroscopic shoulder surgery offers several advantages over open procedures, including reduced soft tissue disruption, enhanced visualization of the glenohumeral joint and faster postoperative recovery, which facilitate more precise identification of tear morphology and the capacity to address multiple pathologies in a single procedure. Numerous studies have demonstrated favorable outcomes following arthroscopic rotator cuff repair and labral stabilization, with significant improvements in pain relief and functional recovery, supporting the widespread adoption of these minimally invasive techniques [5,7].

Assessment of clinical outcomes following shoulder arthroscopy relies on validated functional scoring systems. Outcome measures such as the Visual Analog Scale, Constant–Murley score and UCLA shoulder score are widely used to quantify pain intensity, shoulder strength, range of motion and overall function [8]. These instruments have shown strong responsiveness and clinical relevance in evaluating postoperative improvement following arthroscopic interventions [9]. Their standardized application facilitates comparison across studies and populations.

Despite extensive global literature supporting arthroscopic management of shoulder injuries, outcome data from South Asian populations remain limited. Differences in patient demographics, occupational exposure, healthcare access and delayed presentation may influence surgical outcomes in this region. Bangladesh lacks sufficient institution-based evidence evaluating functional recovery and complication profiles following shoulder arthroscopy. Local data are essential to validate international findings and guide clinical decision-making in resource-limited settings [10].

Furthermore, few studies have concurrently evaluated demographic characteristics, intraoperative arthroscopic findings and short-term functional outcomes within a single cohort. Understanding the relationship between tear patterns, surgical findings and postoperative recovery may improve patient selection and preoperative counseling. Early identification of complications and return-to-activity rates also provides meaningful insight into surgical effectiveness [11]. Therefore, this study aims to evaluate the clinical outcomes of shoulder arthroscopy in patients with rotator cuff and labral injuries treated at a tertiary care center, addressing existing gaps in regional evidence.

Materials & Methods

This retrospective observational study was conducted at the Department of Orthopedics, Bangladesh Medical University, Dhaka, Bangladesh. The study period extended from July 2023 to June 2025. A total of 30 patients who underwent shoulder arthroscopy for rotator cuff and or labral injuries during the study period were included in this study.

Selection Criteria

Inclusion Criteria

- Patients aged 18 years and above.
- Patients diagnosed with rotator cuff tears, labral tears, or combined lesions.
- Patients who underwent arthroscopic shoulder surgery.
- Patients with complete clinical and follow-up records.
- Patients with a minimum follow-up duration of six months.

Exclusion Criteria

- Patients with previous shoulder surgery on the affected side.

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- Patients with shoulder fractures, infections, or inflammatory arthropathies.
- Patients with advanced glenohumeral osteoarthritis.

Data Collection Procedure

Data were collected retrospectively from hospital medical records, operative notes and follow-up documentation. Patient demographic information, occupational status, symptom duration and affected side were recorded systematically. Preoperative clinical evaluation included pain assessment using the Visual Analog Scale and functional scoring with Constant–Murley and UCLA shoulder scores. Intra-operative findings were obtained from standardized arthroscopic reports detailing tear type, location and size. Postoperative functional outcomes were assessed at six months using the same validated scoring systems to ensure consistency. Clinical outcome categories were defined according to functional improvement and patient-reported recovery. Complications were identified through follow-up clinic notes and documented patient complaints. Data accuracy was ensured through cross-verification of records by two independent investigators. All patient identifiers were removed to maintain confidentiality. Informed consent was obtained from all patients before surgery, permitting the use of anonymized data for research purposes.

Statistical Analysis

Data were analyzed using SPSS version 25.0. Descriptive statistics were used to summarize demographic variables and clinical characteristics. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Preoperative and postoperative functional scores were compared using paired statistical methods, with significance set at $p < 0.05$.

Results

Table 1: Baseline Demographic and Clinical Characteristics (n = 30)

Variable		Frequency (n)	Percentage (%)
Age Group (years)	18–30	8	26.7
	31–45	14	46.7
	>45	8	26.7
Sex	Male	22	73.3
	Female	8	26.7
Affected Shoulder	Right	19	63.3
	Left	11	36.7
Occupation Type	Manual labor	16	53.3
	Non-manual	14	46.7
Symptom Duration	<6 months	9	30
	6–12 months	13	43.3
	>12 months	8	26.7

Table 1 presents the baseline demographic and clinical characteristics of the 30 study participants. The largest proportion of patients belonged to the 31–45-year age group (46.7%). Male patients predominated the cohort, accounting for 73.3% of cases. The right shoulder was more frequently affected than the left shoulder (63.3% vs. 36.7%). Manual laborers constituted slightly more than half of the study population (53.3%). Most patients reported symptom duration between 6 and 12 months before surgery (43.3%).

Table 2: Intra-operative Arthroscopic Findings

Arthroscopic Diagnosis	Frequency (n)	Percentage (%)
Isolated rotator cuff tear	11	36.7
Isolated labral tear	9	30.0
Combined rotator cuff + labral tear	10	33.3

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Type of Labral Lesion		
SLAP (Type II/III)	7	23.3
Anterior labral (Bankart)	6	20.0
Posterior labral	6	20.0
Rotator Cuff Tear Size		
Small (<1 cm)	8	26.7
Medium (1–3 cm)	9	30.0
Large (>3 cm)	4	13.3

Table 2 describes the intraoperative arthroscopic diagnoses observed during surgery. Isolated rotator cuff tears were identified in 36.7% of patients. Isolated labral tears were found in 30.0% of cases, while combined lesions were present in 33.3%. Among labral injuries, SLAP type II or III lesions were the most frequent pattern (23.3%). Anterior and posterior labral tears were observed in equal proportions (20.0% each). Medium-sized rotator cuff tears were the most common tear size identified (30.0%).

Table 3: Functional Outcome Scores Pre- and Post-Operatively (6-Month Follow-up)

Outcome Measure	**Preoperative Mean ± SD**	**Postoperative Mean ± SD**	**P-value**
VAS Pain Score (0–10)	6.8 ± 1.1	2.1 ± 0.9	<0.001
Constant–Murley Score (0–100)	46.3 ± 8.4	78.9 ± 7.6	<0.001
UCLA Shoulder Score (0–35)	15.8 ± 3.6	29.1 ± 3.4	<0.001

Table 3 compares preoperative and postoperative functional outcome scores at six-month follow-up. The mean VAS pain score decreased from 6.8 ± 1.1 preoperatively to 2.1 ± 0.9 postoperatively. The Constant–Murley score improved from 46.3 ± 8.4 to 78.9 ± 7.6 following surgery. Similarly, the UCLA shoulder score increased from 15.8 ± 3.6 to 29.1 ± 3.4. All outcome measures demonstrated statistically significant differences between preoperative and postoperative assessments, indicating meaningful clinical improvement after surgery.

Table 4: Postoperative Clinical Outcomes and Complications

Outcome Variable		**Frequency (n)**	**Percentage (%)**
Overall Clinical Outcome	Excellent	14	46.7
	Good	10	33.3
	Fair	4	13.3
	Poor	2	6.7
Return to Pre-injury Activity	Yes	23	76.7
	No	7	23.3
Postoperative Complications	Shoulder stiffness	3	10.0
	Persistent pain	2	6.7
	Re-tear (clinically suspected)	1	3.3

Table 4 summarizes postoperative clinical outcomes and complication rates. Excellent or good outcomes were achieved in 80.0% of patients at six months. Return to pre-injury activity levels was reported by 76.7% of participants. Postoperative shoulder stiffness was the most frequent complication, occurring in 10.0% of cases. Persistent pain and clinically suspected re-tear were observed in 6.7% and 3.3% of patients, respectively.

Discussion

The present study demonstrates that arthroscopic management of rotator cuff and labral injuries results in

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significant pain reduction and functional improvement at six-month follow-up. The observed improvements across multiple outcome measures confirm the effectiveness of arthroscopic techniques in addressing both isolated and combined shoulder pathologies. These findings support the growing body of evidence favoring minimally invasive approaches for shoulder disorders.

The demographic distribution revealed a predominance of middle-aged male patients, which is consistent with epidemiological trends reported by Bedi et al. in rotator cuff disease [1]. This pattern likely reflects higher occupational exposure to repetitive shoulder loading and physically demanding activities among males in this age group. The substantial proportion of manual laborers in the study population further reinforces the association between occupational demand and shoulder pathology. Zhao et al. identified repetitive mechanical stress and delayed presentation as key contributors to tendon degeneration and tear progression [3].

Intraoperative arthroscopic findings demonstrated a notable incidence of combined rotator cuff and labral lesions. Alexeev et al. highlighted the significant variability in labral tear patterns and emphasized that preoperative imaging may underestimate the extent of intra-articular pathology [4]. The coexistence of rotator cuff and labral injuries observed in this study aligns with previous reports describing complex shoulder injury mechanisms, particularly following trauma or repetitive overhead activity [12]. Arthroscopy allowed accurate identification and simultaneous management of these lesions.

Medium-sized rotator cuff tears were the most frequently encountered tear size in this cohort. Jeong et al. reported that medium-sized tears are associated with favorable healing potential and functional recovery when treated arthroscopically [13]. The predominance of these tears may have contributed to the substantial postoperative improvements observed in this study. Tear size remains an important prognostic factor influencing surgical outcomes and tendon healing.

The distribution of SLAP and Bankart lesions in the present study parallels patterns described in shoulder instability literature. Kraeutler et al. reported similar distributions of labral injury patterns in patients undergoing arthroscopic stabilization [14]. Accurate recognition and repair of these lesions are essential for restoring shoulder stability and preventing recurrent symptoms. Arthroscopic visualization provides a distinct advantage in addressing complex labral pathology.

Functional outcome analysis demonstrated statistically significant improvement across all validated scoring systems used in this study. Pain reduction, as measured by the Visual Analog Scale, showed a highly significant postoperative decrease, indicating effective symptom control following arthroscopic intervention ($p < 0.001$). Similar statistically significant gains were observed in both Constant–Murley and UCLA shoulder scores, reflecting meaningful improvement in shoulder strength, range of motion and functional capacity. Abed et al. reported comparable postoperative improvements using these scoring systems, supporting their sensitivity in detecting clinically relevant changes after shoulder arthroscopy [8].

The observed functional recovery aligns with findings from systematic reviews and cohort studies evaluating arthroscopic rotator cuff repair and labral stabilization. Longo et al. demonstrated that arthroscopic repair consistently produces statistically significant improvements in validated functional scores, particularly within the first six months postoperatively [15]. The statistically significant outcomes observed in the present study further support the effectiveness of arthroscopic techniques in restoring shoulder function across diverse patient populations.

Return to pre-injury activity was achieved by more than three-quarters of patients. Altintas et al. reported comparable return-to-activity rates following arthroscopic rotator cuff repair, particularly among recreational and occupational populations rather than elite athletes [11]. The ability to resume previous activity levels is a critical indicator of surgical success, especially in working-age individuals. The findings suggest that arthroscopic management effectively restores functional capacity even in physically demanding occupations.

Postoperative complications were infrequent and predominantly minor. Shoulder stiffness emerged as the most common complication, which is consistent with reports by Mandaleson, who identified stiffness as a frequent early postoperative issue following rotator cuff surgery [16]. The low incidence of persistent pain and clinically suspected re-tear aligns with short-term outcomes reported by Holtedahl et al. in their meta-

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analysis of posterosuperior rotator cuff repairs [17]. These findings indicate acceptable short-term safety and efficacy.

The excellent and good outcome rate observed in this study supports the growing consensus favoring arthroscopic techniques for shoulder pathology. Migliorini et al. demonstrated that arthroscopic repair provides outcomes comparable or superior to open approaches while reducing surgical morbidity and recovery time [2]. These advantages are particularly relevant in tertiary care centers managing diverse patient populations and limited resources.

Importantly, this study contributes valuable regional data from Bangladesh, addressing a significant gap in South Asian orthopedic literature. Davey et al. emphasized the importance of institution-based outcome reporting to contextualize global evidence and account for regional variations in patient characteristics and healthcare delivery [10]. The present results reinforce the applicability of international surgical standards within the local healthcare setting.

Overall, the findings corroborate existing literature supporting arthroscopic intervention for rotator cuff and labral injuries. The consistent improvement in functional scores, high return-to-activity rates and low complication incidence underscore the clinical effectiveness of shoulder arthroscopy in this population.

Conclusion

This study demonstrates that shoulder arthroscopy for rotator cuff and labral injuries results in significant pain relief and functional improvement at short-term follow-up. Statistically significant gains across validated outcome measures confirm the clinical effectiveness of arthroscopic intervention. The high rate of favorable outcomes and low complication profile support arthroscopy as a reliable treatment option for shoulder pathology. These findings provide important region-specific evidence to guide clinical practice in similar healthcare settings. Long-term follow-up and multicenter prospective studies are recommended to validate these findings and assess the durability of outcomes.

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Conflicts of interest: There are no conflicts of interest.

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