

Persistent Shoulder Pain in a Recreational Climber: Symptomatic Buford Complex — A Case Report

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Abstract

Background: The Buford complex (BC) is a rare anatomical variant of the shoulder characterized by the absence of the anterosuperior glenoid labrum combined with a thick, cord-like middle glenohumeral ligament (MGHL). Though typically asymptomatic, it can occasionally contribute to shoulder pain or instability and is frequently misinterpreted as a pathologic labral tear during imaging or arthroscopy.

Case Presentation: A 27-year-old right-handed female recreational indoor climber presented with a 10-month history of progressive left shoulder pain exacerbated by overhead and traction movements. Physical examination revealed anterior joint-line tenderness, positive O'Brien's test, and pain on external rotation in abduction. Ultrasound suggested a paralabral cyst. MR arthrography demonstrated a complete absence of the anterosuperior labrum and a thick cord-like MGHL, consistent with a BC, without labral tear or rotator cuff pathology. A corticosteroid subacromial injection produced no benefit. The patient underwent a structured physical medicine and rehabilitation program focused on scapulohumeral stability, rotator cuff strengthening, and proprioceptive control. After six weeks, she reported substantial pain reduction and complete recovery of overhead motion, with full, pain-free return to climbing at three months.

Discussion: The BC may disrupt the normal biomechanics of the glenohumeral joint, becoming symptomatic in athletes engaged in repetitive overhead or traction activities. Correct differentiation from labral pathology on MR arthrography is crucial to avoid misdiagnosis and to guide an effective, conservative management strategy.

Conclusion: Early recognition of a BC and implementation of a structured rehabilitation program focusing on scapulohumeral stability and neuromuscular control can achieve complete functional recovery and prevent unnecessary surgical intervention.

Keywords: Buford Complex, Shoulder Pain, MR Arthrography, Rehabilitation, Middle Glenohumeral Ligament, Case Report.

Introduction

The Buford complex (BC) is a rare anatomical variant of the shoulder, defined by the complete absence of the anterosuperior glenoid labrum and the presence of a thick, cord-like middle glenohumeral ligament (MGHL) that attaches to the superior labrum near the biceps anchor [1-3]. This variant was first char-

acterized as a normal anatomical finding, but its clinical relevance has become increasingly recognized due to its association with labral pathology [4, 5]. The prevalence of BC in large arthroscopic series is approximately 2.65%, with a significantly higher frequency of concomitant superior labrum anterior-posterior (SLAP) lesions compared to shoulders without this variant

(81.9% vs. 33.1%). In patients without labral injury, the prevalence is much lower, at 0.3%. These findings suggest that BC may predispose to or coexist with labral pathology, rather than being a purely incidental anatomical variant. Imaging studies, particularly MR arthrography, have demonstrated that BC can be misinterpreted as anterior labral tears or SLAP lesions, potentially leading to inappropriate surgical intervention. Recognition of this variant is critical, as reattachment of the MGHL to the glenoid—mistakenly identified as a torn labrum—can result in iatrogenic complications such as shoulder stiffness and loss of motion. Recent research also suggests a possible developmental or adaptive etiology, as pediatric series have not identified BC in children under 11 years, and there may be a relationship with glenoid version and scapular morphology. Accurate identification of BC is essential for appropriate management and to avoid unnecessary surgical procedures [6, 7].

This report describes a rare case of symptomatic isolated BC in a recreational climber successfully managed through a conservative rehabilitation program.

Case Description

A 27-year-old right-handed woman, recreational indoor climber, presented with a 10-month history of progressive left shoulder pain aggravated by overhead and traction movements during climbing. There was no history of trauma or instability episodes. Physical examination revealed anterior joint-line tenderness, a positive O'Brien's test, and pain on external rotation in abduction. Shoulder stability tests were negative. Ultrasound showed a small paralabral cyst inconsistent with the clinical picture. MR arthrography demonstrated complete absence of the anterosuperior labrum between the 1 and 3 o'clock positions and a thick, cord-like MGHL inserting on the base of the long head of the biceps tendon, without SLAP lesion, rotator cuff tear, or chondral injury, consistent with a BC (Figure 1). A subacromial corticosteroid injection produced no pain relief [8]. A structured PMR program focusing on dynamic scapulohumeral stabilization, rotator cuff strengthening, and proprioceptive re-education was initiated. After six weeks, the patient reported marked reduction in pain and regained full, pain-free range of motion. At three months, she resumed recreational climbing without limitation, and no recurrence was reported at six-month follow-up.

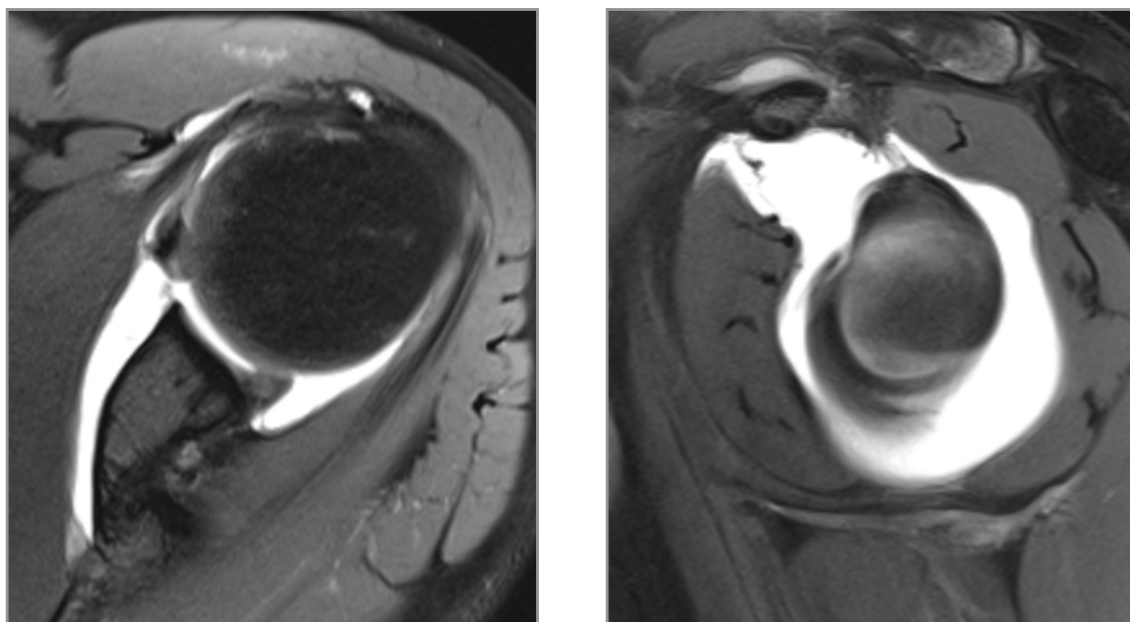


Figure 1: Shoulder MRI arthrography – T1-weighted TSE with fat suppression (FS). Axial (A) and sagittal (B) images demonstrating absence of labrum and a thickened middle glenohumeral ligament. MRI, magnetic resonance imaging.

Discussion

On MR arthrography, BC is characterized by a smooth absence of the anterosuperior labrum and a cord-like middle glenohumeral ligament (MGHL) coursing obliquely from the superior glenoid toward the humeral neck, which must be distinguished from labral detachment that presents with irregular margins or contrast extension beneath the labrum. The thick MGHL configuration provides capsular reinforcement but may alter glenohumeral biomechanics, especially in athletes exposed to repetitive overhead stress. Biomechanical studies and clinical series suggest that absence of the anterosuperior labrum can reduce anterior-superior joint contact area and modify the biceps-labral tension vector, potentially contributing to microinstability and pain during dynamic loading [9].

Recent literature consistently demonstrates a strong association between BC and labral pathology, particularly SLAP lesions, with large cohort and meta-analytic data showing a significantly increased risk of SLAP lesions in patients with BC. However, isolated symptomatic BC remains rare, and when present without structural tears, conservative management is generally effective. Rehabilitation programs focusing on neuromuscular control, scapular stability, and rotator cuff strengthening are recommended to restore balanced shoulder mechanics and symptom-free motion. Surgical intervention should be reserved for cases with associated instability, MGHL tearing, or SLAP lesions, as operative repair in isolated BC may result in stiffness and poor functional outcomes [10].

In the present case, repetitive overhead traction from climbing likely produced localized mechanical stress on the anterosuperior capsule and MGHL, leading to pain without tissue disruption. Complete recovery following nonoperative treatment supports current evidence that structured rehabilitation yields excellent outcomes in isolated BC and should be considered first-line therapy [11].

Conclusion

The BC is a rare anatomical variant that can become symptomatic, particularly in athletes performing repetitive overhead or traction movements. Proper recognition on MR arthrography prevents confusion with labral tears and avoids unnecessary surgical procedures. In cases without associated structural lesions, a conservative, rehabilitation-based approach focusing on dynamic stabilization and proprioceptive control can achieve full recovery and return to activity. Awareness of this variant among clinicians and radiologists remains essential for accurate diagnosis and optimal patient outcomes [12, 13].

Patient Consent

Written informed consent was obtained from the patient for publication of this case and the accompanying images.

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