

# Long Head of Biceps Interposition as a cause of Persistent Pain and Subluxation following Acute Anterior Shoulder Dislocation

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## Abstract

A 65 year old gentleman presented with persistent severe pain and joint incongruity on plain radiographs following a first time traumatic anterior shoulder dislocation without concurrent fracture to the tuberosities. Further investigation with MRI scan demonstrated interposition of the long head of biceps tendon within the glenohumeral joint, causing persistent pain and joint incongruity seen on AP and Axillary radiographs. Under arthroscopy the tendon was grossly tendinopathic at its insertion into the labrum, and reduction into the inter-tubercular groove was not possible. Tenotomy was performed, which immediately resolved the patients symptoms. Repeated radiographs demonstrated that the joint congruity had been restored. This case demonstrates that long head of biceps displacement is possible without concurrent fracture, and is a rare but important cause for persistent disproportionate pain post-reduction. Radiographs should be examined carefully for any evidence of joint incongruity, and ultrasound or MR scanning will adequately demonstrate interposition of the long head of biceps within the glenohumeral joint.

**Keywords:** Anterior shoulder dislocation; Biceps tendon interposition; Glenohumeral-subluxation.

## Introduction

The gleno-humeral joint is the most frequently dislocated joint in the body, and in 95% of cases the dislocation is anterior. Reduction can be usually be achieved closed in the Emergency Department, but infrequently requires general anaesthetic or open reduction. Widely known complications associated with shoulder dislocation include concurrent fracture, Hill-Sachs lesions, Bankhart lesions, and nerve injury. Once reduced, imaging should be obtained in two perpendicular views to confirm reduction, and the patients symptoms are expected to be significantly improved. We report an unusual case of persisting anterior subluxation and severe post-reduction pain, following isolated anterior dislocation of the glenohumeral joint. Investigations revealed interposition of long head of biceps tendon in the joint, which was successfully treated via arthroscopic tenotomy of the tendon.

## Case Report

A 65-year-old gentleman with a past medical history of COPD, recent Pulmonary Embolus on Warfarin, and Coronary Stents attended the Emergency Department following a trip and a fall onto his right side. On assessment he complained of pain in the right shoulder, associated with clinical deformity and loss of normal shoulder contour in keeping with an acute dislocation. This was an isolated, closed injury, with no history of previous shoulder pain or dysfunction. Neurovascular examination demonstrated paraesthesia in the axillary nerve distribution, but maintained motor function of the Deltoid muscle.

AP and axillary radiographs were taken which confirmed the diagnosis of an acute anterior shoulder dislocation, and reduction was attempted in the Emergency Department using longitudinal traction in the 'Oxford Chair'. Reduction could not be achieved, and the gentleman was referred to the Orthopaedic Team. The decision was made

to perform a Manipulation under Anaesthetic in theatre that evening once the INR had been normalised.

The shoulder was successfully reduced under Anaesthetic in theatre, but post-operative recovery was poor because of persisting severe shoulder pain and back pain, the latter of which was treated successfully with an L4 kyphoplasty. A CT of the shoulder demonstrated a minimally displaced bony Bankart lesion, which was adjudicated to be responsible for the ongoing symptoms. This was managed non-operatively.

During outpatient follow up the patient still complained of persisting shoulder pain, radiating anteriorly down the upper arm. Severity was disturbing sleep and prohibiting any meaningful physiotherapy. New radiographs demonstrated gleno-humeral joint incongruity, with some anterior subluxation (Fig.1).

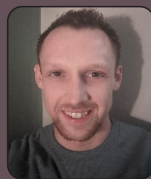
He was referred to the upper limb team for further investigation and management. An Ultra-sound of the Rotator Cuff and MRI

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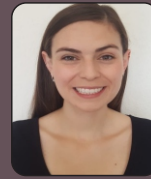
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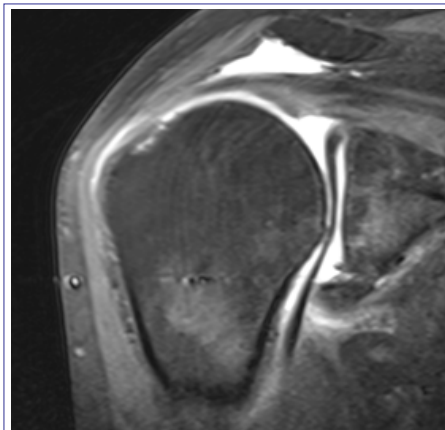
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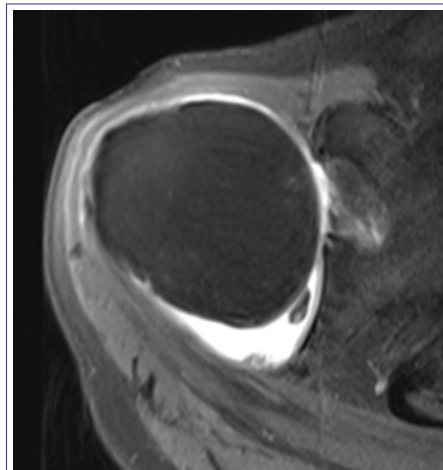
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**Figure 1:** Axillary View taken in the outpatient clinic demonstrates ongoing anterior subluxation of the humeral head.



**Figure 2:** Coronal MRI Arthrogram section demonstrating Long Head of Biceps Interposition and an associated Superior Labral avulsion. The presence of contrast in the subacromial space can also be appreciated, and indicates a concurrent full thickness rotator cuff tear.



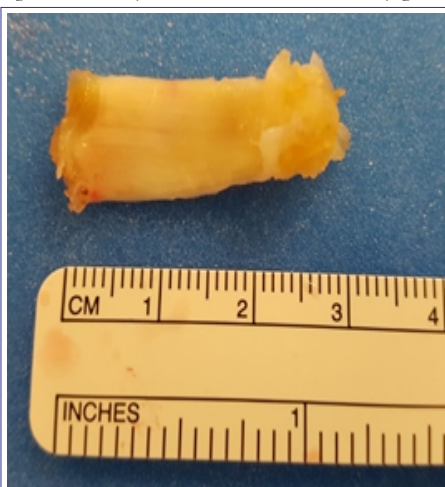
**Figure 3:** Axial MRI Arthrogram Section, with long head of biceps tendon sitting immediately lateral to the glenoid fossa. The persisting anterior subluxation can also be appreciated.

arthrogram of the shoulder were requested. These demonstrated a massive rotator cuff tear and interposition of the long head of biceps tendon (LHB) within the gleno-humeral joint, which had dislocated from the intertubercular groove. This trapping of the tendon between humeral head and glenoid was causing severe pain radiating distally into the biceps muscle belly, and persistent incongruity of the gleno-humeral joint on radiographs (Fig. 2, 3).

An arthroscopy was performed which confirmed the MRI findings. The LHB insertion on the labrum was macroscopically tendinopathic (Fig. 4). Manipulation of the tendon using a probe via the anterior portal was attempted, but was resistant to reduction into the groove. A proximal tenotomy was therefore performed, and the tendon remained trapped within the inferior recess.



**Figure 4:** Arthroscopy demonstrating humeral head (right), LHB (middle), and glenoid surface (left). There is injection and tendinopathic changes at the LHB insertion at the superior labrum.



**Figure 5:** Tenotomised intra-articular section of LHB tendon, measuring 30mm.

Therefore, a more distal tenotomy was also made, and a 30mm length of tendon removed (Fig. 5). A large SLAP lesion was also noted from 9-3 o'clock on the glenoid rim, which reduced following tenotomy. Immediate and Short term post-operative recovery was uneventful, with immediate relief of the severe pre-operative pain.

#### Discussion

This case identifies an important yet seldom seen cause of persistent pain and dysfunction of the shoulder following a traumatic first-time anterior shoulder dislocation. Dislocation and interposition of the Long Head of Biceps within the gleno-humeral articulation can cause ongoing severe pain, which radiates into the biceps muscle belly anteriorly in the upper arm. The patient in question duly demonstrated extremely poor

rehabilitation with the physiotherapists. No radiographs taken post-operatively were able to demonstrate a fully congruent gleno-humeral joint, and each axillary view indicating some anterior subluxation. Importantly, a CT scan was unable to demonstrate the displaced biceps tendon. Any of the above signs post dislocation should be treated therefore as red flags, indicating a third body within the joint space. This is a rarely reported phenomenon. One previous Case Report in 1982 reported three irreducible anterior shoulder dislocations, due to interposition of the long head of biceps, the labrum, and a greater tuberosity fragment in the gleno-humeral joint [4]. In contrast, the humeral head in our reported case could be reduced, despite the displaced biceps tendon. Otherwise this rare post-dislocation phenomenon has only been seen following a posterior dislocation in isolation [5], with concurrent tuberosity fracture [2], or in addition to Subscapularis tendon avulsion and humeral neck fracture [1]. One further case reported a rare 'supero-lateral' dislocation, associated with a Massive rotator cuff and longitudinal deltoid split, which also demonstrated interposition of the biceps tendon as a block to reduction [6]. Musculocutaneous nerve interposition post anterior dislocation has also been cited [3]. This case indicates that this phenomenon is also possible with the more common acute anterior dislocation, and is an important cause of persisting severe pain, with subtle subluxation of the humeral head demonstrated on imaging.

**Conclusion**

It is crucial that interposition of structures not visible on plain radiographs be considered in (a) both isolated anterior and posterior dislocations which demonstrate ongoing joint incongruity post reduction, (b) those patients who complain of persisting

severe pain which fails to settle post reduction or (c) pain radiating anteriorly into the biceps muscle. It would be worthwhile evaluating whether gentle testing of the long head of biceps via passive and resisted supination exacerbates the pain. Our case demonstrates that neglected entrapment of the long head of

biceps can lead to a macroscopically tendinopathic and irreducible tendon on arthroscopy, which requires tenotomy for symptom relief.

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