



## **Our Technique in Replacement Labral Defect by Using Biceps Tendon**

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## **Abstract**

*One of the most common orthopedic pathologies that face the orthopedic surgeons is anterior recurrent shoulder, which may cause either due to trauma or recurrent abduction and external rotation. Shoulder stability depends on the labrum which is responsible for deepening of the glenoid. There are many techniques to manage anterior recurrent shoulder dislocation either through open or arthroscopic technique. Arthroscopic Bankart repair is the most popular method used to obtain shoulder stability. Using Biceps tendon as autograft is a new technique to replace the labral defect in the patients have unreconstable labrum, the purpose of this study to explain this technique.*

**Methods:** *36 patients with history of recurrent anterior shoulder dislocation involved in this study presented to our clinic at the orthopedic department in King Hussein Medical Center between January 2018 to October 2023. All the patients were evaluated clinically, they had a positive apprehension and relocation tests, and radiologically by asking for X-ray, MRI. A questioner American Shoulder and Elbow Surgeons (ASES) and Disabilities of Arm, Shoulder and Hand (DASH) scores to evaluate the activities of the patient's pre-operation and post-operation. The average age for the patients 36 years (range 17-55 years), the average follow-up period was 21 months (range 6 – 36 months).*

**Results:** *After the mean time of follow up 21 months all the patients have a negative apprehension and relocation tests, they have a free pain full range of motion. American Shoulder and Elbow Surgeons score pre- operation was (40%-58%) and post-operation (85%-95%), while Disabilities of Arm, Shoulder and Hand score pre-operation was (26.8% – 29.5%) and post-operation (4.2% – 5%). All the shoulder scores improved significantly ( $p < 0.05$ ).*

**Conclusion:** *Biceps autograft to replace the labral defect considers a good option to restore shoulder stability by gaining the bumper effect as it deepening the glenoid, it reduces the need for other procedures such as Latarjet and it reduces the rate of anterior shoulder dislocation. On other hand it has less side effect.*

**Keywords:** *Recurrent anterior shoulder dislocation, Bankart repair, Biceps tendon autograft, Latarjet procedure.*

## Introduction

Injury of the labrum is a common cause for recurrent anterior shoulder dislocation as labrum deepened 50% of glenoid, repetitive abduction with external rotation and trauma which causing labral injury is the main cause of shoulder dislocation [1]. The patients who are between 16-28 are more likely to shoulder dislocation with high prevalence of recurrence and shorter interval between the first episode of shoulder dislocation and recurrent instability [2]. Patients with shoulder dislocation is divided into three groups according to Walch, those who have a shoulder dislocation that reduced by another person is classified as group 1, group 2 those with shoulder subluxation (the shoulder is not completely dislocated), while group 3 those who have painful shoulder due to instability of the shoulder which confirmed by physical examination [3].

Outcome of management of shoulder dislocation and its difficulties due to capsuloligamentous and labral defect keened in many studies [4]. The main cause of shoulder dislocation is Bankart lesion which can be treated by arthroscopic Bankart repair by using anchors. Patients with labral tear or glenoid bone loss more than 25% have a high recurrence rate [5], Repairing the bankart lesion and capsule stretching is very important to gain stable shoulder in patients who complained of recurrent shoulder dislocation.

According to cadaveric studies 19% to 21% of glenoid defect may only need a soft tissue repair while when there is more than 25% of glenoid defect Latarjet contemplates a good solution to manage anterior recurrent shoulder dislocation [6,7].

Since 2018 we started to use our new technique which we described it by using the biceps tendon as autograft to replace the labral and glenoid defect which will restore the glenohumeral joint in those patients who complain of recurrent anterior shoulder dislocation.

The purpose of this study to explain our technique by using biceps tendon as a graft to replace the labral defect and its outcome.

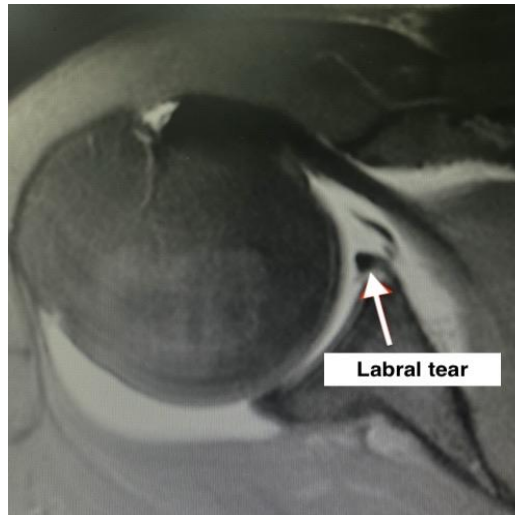
## Methods

36 patients with history of recurrent anterior shoulder dislocation involved in this study presented to our clinic at the orthopedic department in King Hussein Medical Center between January 2018 to October 2023. All the patients were evaluated clinically, they had a positive apprehension and relocation tests [8]. Patients who have a neurological or muscular abnormality were excluded from this study while patients have a Rotator cuff tear were included in this study. Patients also were evaluated radiologically by asking for X-ray AP view, internal and external views, axillary view, CT scan for any bony pathology such as bony Bankart and MRI to confirm the labral defect and if it is associated with another pathology (Figure1). A questioner American Shoulder and Elbow Surgeons (ASES) and Disabilities of Arm, Shoulder and Hand (DASH) scores to evaluate the activities of the patient's pre-operation and post-operation. The average age for the patients 36 years (range 17-55 years), the average follow-up period was 21 months (range 6 – 36 months). During the period of follow up there is no patient presented with history of shoulder dislocation post operation. All the patients who underwent this technique had unreparable labral defect.

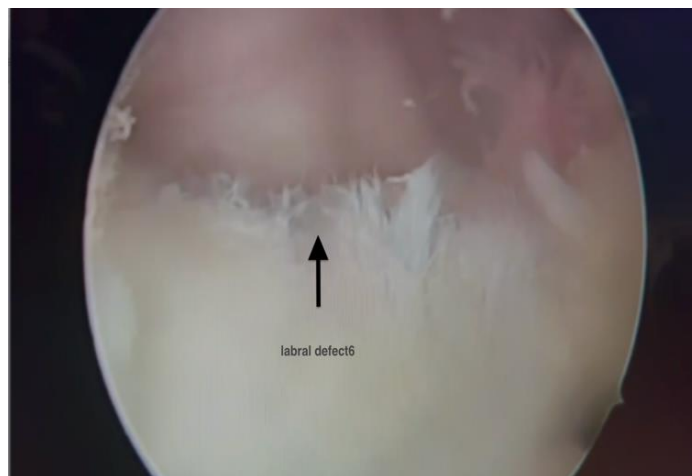
## Surgical Technique

The technique is performed by the main author, after either general anesthesia or regional block the patient is positioned in lateral position, the arm is retracted by a traction sleeve in 70 degrees abduction and 10-degree forward flexion. Two portals were used the posterior portal and the anterior superior portal using outside-in technique. Diagnostic evaluation for the shoulder joint and the labrum, we identified the situation of the labrum if it can't be repaired, we decided to use the biceps tendon as graft to replace the labral defect (figure2). The shaver is used to prepare the glenoid. A double loaded suture anchor is inserted at the inferior part of glenoid at 5 o'clock for the Right shoulder and 7 o'clock for the left shoulder 2 to 2 mm from the glenoid rim. The suture passer is inserted through the Biceps tendon (figure3), then the shuttle or PDS suture is retrieved from the anterior portal and loaded with one of the anchor sutures and then the free part of the shuttle or PDS is retrieved the loaded suture, a similar step is done for the inferior part of the capsule. The radiofrequency is used for tenotomy of the most proximal part of biceps tendon. A simple stitch is done, and knot technique is performed depend on the surgeon preference this will approximate the proximal part of the Biceps tendon to the inferior part of the capsule (figure4).

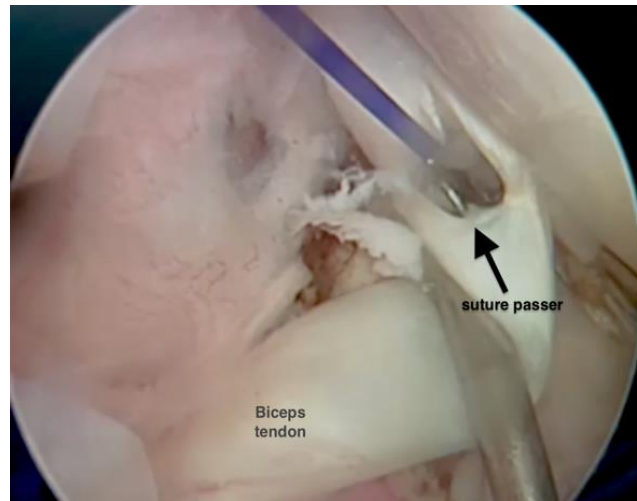
Then the suture passer (spectrum) is passed either from the capsule and under the Biceps tendon or directly pass under the Biceps tendon and then the PDS is retrieved with the second suture and the knot is performed. The same steps are performed for the second and third anchors. The patient's arm is held by the arm sling and abduction pillow 30 degrees.



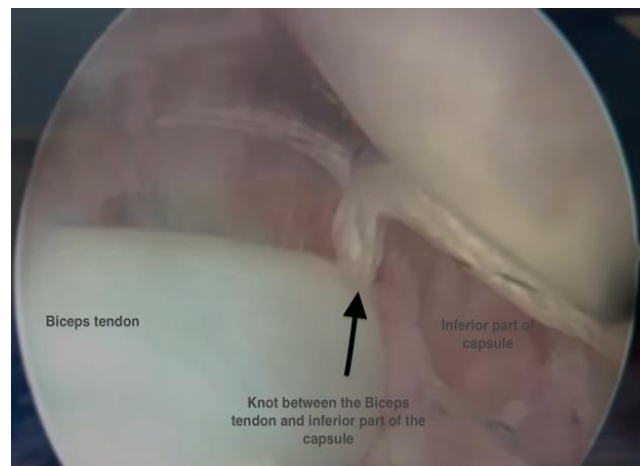
**Figure 1:** White arrow shows labral tear



**Figure 2:** Black arrow shows unrepairable labral defect



**Figure 3:** shows the suture passer passes the Biceps tendon



**Figure 4:** Shows the knot between the Biceps tendon and the inferior part of the capsule

## Results

After the mean time of follow up 21 months all the patients have a negative apprehension and relocation tests, they have a free pain full range of motion. American Shoulder and Elbow Surgeons score pre-operation was (40%-58%) and post-operation (85%-95%), while Disabilities of Arm, Shoulder and Hand score pre-operation was (26.8% – 29.5%) and post-operation (4.2% – 5%). All the shoulder scores improved significantly ( $p < 0.05$ ).

## Discussion

Recurrent anterior shoulder dislocation may affect hard worker and athletes, most of the cases were treated surgically either by arthroscopy or open. Injury which caused capsulo-labral detachment can be managed by arthroscopy. Latarjet is a procedure to restore the shoulder stability when there is bone loss in the glenoid rim by the sling effect of the conjoint tendon [9]. Patients with poor soft tissue, glenoid rim erosion or high impacted athletes have a high recurrence rate which reached up to 37% [10,11]. According to many studies which show that there are several risk factors which considered as a reason for high rate of failure in professional players who need forceful external rotation and abduction, younger age and those with soft tissue and bone defects [12,13]. Soft tissues procedure has a less complication than transfer the coracoid process to glenoid as nonunion [14], graft resorption [15,16] and graft migration [14], also destroying the coracoacromial arch which cause superior instability [17,18].

There is study which suggest transfer of the long Biceps tendon to the anterior border of the glenoid cavity through the subscapular tendon, this will reproduce a tensile effect, create an anterior barrier and increase the labral surface through augmentation with the tendon [19,20,21,22,23]. Another study which used the Biceps tendon as a sling to augment the shoulder in the anterior inferior angel of the glenoid by creating a tunnel in the glenoid and fixation of the Biceps tendon inside the tunnel [24].

In our technique Using Biceps tendon as autograft to cover the labral defect will do the same work of the labrum to form a bumper by deepening the socket so the ball will be in its place, for this reason we repair the capsule and the Biceps tendon to restore shoulder instability with less side effects when comparing with conjoined tendon transfer and it is a simple procedure.

## Conclusion

Biceps tendon when it is used as a graft to replace the labral defect will work as the same way of the labrum by deepening of the glenoid this will make the head of the humerus in its place, the labrum will be as a pumper. This technique will restore the shoulder instability with less complication and a significant result comparing with Latarjet procedure, in addition it is a simple procedure. The patients who underwent this technique had a significant improvement in ASES and DASH scores, with pain-free full range of motion and negative apprehension and relocation tests post operative.

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