

A STUDY OF MANAGEMENT OF RECURRENT ANTERIOR DISLOCATION SHOULDER BY MODIFIED BOYTCHEV PROCEDUREVelugu Prashanth¹, Ananthula Krishna Reddy², Ashok Ohatker³, B. Sudheer Kumar⁴, S. Siddhartha⁵**HOW TO CITE THIS ARTICLE:**

Velugu Prashanth, Ananthula Krishna Reddy, Ashok Ohatker, B. Sudheer Kumar, S. Siddhartha. "A Study of Management of Recurrent Anterior Dislocation Shoulder by Modified Boytchev Procedure". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 76, September 21; Page: 13212-13220, DOI: 10.14260/jemds/2015/1901

ABSTRACT: Recurrent dislocation of shoulder limits the activity of the shoulder and impairs the functional efficiency of the modern man. So far more than 150 surgical procedures were described for the treatment of recurrent dislocation of shoulder. There is no gold standard among them with each having its own advantages and disadvantages. In modified Boytchev procedure, the osteotomised and detached tip of coracoid process with its conjoint tendon attachment is rerouted deep to the subscapularis muscle, and reattached to its original anatomical location. The conjoint tendon with short head of biceps and coracobrachialis in its transferred position produces a strong dynamic buttress effect across the anterior and inferior aspects of the shoulder, when the joint is in the vulnerable position of abduction and external rotation. This is the key for the success of this procedure. Our study evaluates the results of the procedure performed at our institute in 23 subjects during the period of 2002- March 2015. We achieved good to excellent results in 87% of the cases who regained almost full range of motion. One case was noted to have screw loosening on follow up and one case developed shoulder stiffness due to improper physiotherapy.

In conclusion, Modified Boytchev procedure is an effective and a simple procedure to perform, in the management of recurrent dislocation of shoulder.

KEYWORDS: Shoulder, recurrent dislocation, modified Boytchev procedure, subscapularis, conjoint tendon.

INTRODUCTION: The shoulder by virtue of its anatomy and biomechanics is one of the most unstable and frequently dislocated joints in the body accounting for nearly 50% of all dislocations. Recurrent dislocation may limit the activity of the shoulder and impair the functional efficiency of the modern man. Modern hobbies like rock-climbing, gymnastics, and sports like Javelin throw, rugby, soccer and Cricket, increased the demand for early and prompt results, in the treatment of recurrent dislocation.

More than 150 operations were described for the treatment of recurrent dislocation of shoulder.¹ Each procedure has got its own advantages and disadvantages. But none of them is the gold standard. These include Repair of anterior capsular mechanism, Bankarts' Arthroscopic repair, Subscapular muscle shortening and transfer, Bone block procedure, Transfer of tip of coracoid process with muscle attachments, Reinforcement with fascia as free graft, Osteotomy of proximal humerus, Osteotomy of neck of scapula, tendon transfers, Anterior glenoid bone pegs etc.

The exact pathology behind the recurrent shoulder dislocation is not known but supposedly due to Bankart lesion, Hill and Sachs lesion and subscapularis laxity.²⁻⁴ In 1951, Boytchev described a surgery where the detached tip of coracoid process with its conjoint tendon attachment, along with pectoralis minor muscle is rerouted deep to the subscapularis muscle, and reattached to its original anatomical location⁵. Later, Conforty modified this by rerouting the conjoined tendon only.⁶

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MATERIAL AND METHODS: In Gandhi Hospital, Secunderabad over a period of 13 years from 2002 to March 2015, we performed modified Boytchev procedure on 23 patients. The age of the patients ranged from 20 years to 46 years. Of these 18 were on right side and 5 on left. In 4 cases, we found postero-lateral humeral osseous defect on roentgenograms.

Inclusion criteria for our study is patients with more than 4 episodes of dislocations. Patients with epilepsy and other neurological disorders were not included in our study. Detailed history and clinical examination findings were recorded.

All the cases were treated surgically by the modified Boytchev technique only, operated by three surgeons.

AGE GROUP			NO.
20-30	M	14	15
	F	1	
30-40	M	4	5
	F	1	
>40	M	3	3
	F	0	

SURGICAL TECHNIQUE: The patient in supine position with a sand bag under the shoulder which is to be operated. The upper limb is draped separately to manipulate the shoulder whenever needed.

Through Anteromedial approach of Henry, the incision extends from the tip of the corcoid down along the deltopectoral groove. It curves above laterally to the clavicle. The cephalic vein is ligated above and below. The plane between detoid and pectoralis major is developed. If more exposure is needed, the clavicular part of detoid is detached from the clavicle. The deltopectoral fascia is thus exposed. The fascia is cut and the coracoid with the muscles attached is exposed. The coracoid is then drilled in its long axis with a 2.5 mm drill bit. With a power saw, osteotomy of the corcoid process is done proximal to attachment of conjoint tendon of coracobrachialis and short head of biceps (around 1.5 cm proximal to the tip of the coracoid). The fragment of coracoid with the conjoint tendon is reflected down. It is not pulled down unguarded as musculo-cutaneous nerve could be injured. The lower border of subscapsularis tendon is identified by the leash of blood vessels. With a large curved artery forceps, a plane is developed between subcapularis tendon and joint capsule. This plane is enlarged by opening the limb of artery forceps. It is essential to keep the limb in internal rotation to facilitate this part. Two pieces of umbilical tapes are passed under the tendon to enable passing the coracoid with the conjoint tendon through it. Silk stitches are passed through the tendon leaving long limbs. By pulling the umbilical tapes, the tunnel is enlarged and the coracoid is passed deep to the subscapularis tendon from inferior to superior. Silk stitches are removed, and the coracoid is reduced and fixed with a 4 mm AO cancellous screw in the anatomical position. Haemostasis is secured. Wound is closed in layers with a vaccum drain in situ and covered

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with a sterile dressing and abundant axillary padding is applied. Shoulder is immobilized with a cuff and collar.



Fig. 1: Conjoint Tendon



Fig. 2: Coracoid Osteotomised and Detached



Fig. 3: Sutures Passed and Rerouted



Fig. 4: Fixed back with a Screw

POST OPERATIVELY: Active finger, wrist and elbow movements were started immediately. From the third post-operative day, once the pain subsides, pendulum exercises were started. Suture removal done on 10th day and patient is discharged with the advice to continue the pendulum exercises.

FOLLOWUP: At 3 weeks postoperatively, active full ROM shoulder movements were started and the shoulder is strengthened over the subsequent 3 months. Patient is followed up every 3 weeks. The patient is allowed to resume his daily activities and work 3 months post operatively and allowed for sports activities after 6 months.

RESULTS: Most of the reported series in the literature on the various types of reconstructions have yielded excellent results. However, it is very difficult to determine how each author graded his results.

The simple fact that the shoulder no longer dislocated cannot be equated to an excellent result. Although the older literature suggested that the goal of the procedure was to limit external rotation, recent literature suggests that a reconstruction should be done that not only prevents recurrent dislocation, but also allows, eventually, a full range of motion.

The criteria used for grading the results were: condition of operative scar, recurrence of dislocation following surgery, and the possible range of mobility following surgery.

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Excellent	Healthy scar	No. recurrence	Full range of movements	14
Good	Healthy scar	No recurrence	Terminal restriction of abduction & ext. rotation	6
Fair	Mild hypertrophic scar	No recurrence	Possible Abduction--90 ⁰ , ext. rotation--45 ⁰	2
Poor	Thick contracted scar	Recurrence	Stiff shoulder	1

Of the total 23 cases which were followed from 6 months to 13 years, satisfactory (excellent + good) results were found in 20 cases (87%). in one case with lack of exercise the shoulder became stiff. In one case wound gaping was noted which was managed by secondary suturing. Screw loosening was noticed in one case in a 3 months follow up. However, no musculocutaneous nerve injuries were encountered in our series.

DISCUSSION: The pathological anatomy of recurrent dislocation of shoulder is well understood, which includes detachment or tear of the anterior soft tissues (Bankart lesion) and the development of a postero-lateral head defect due to impaction of the humeral head onto anterior glenoid rim (Hill-Sachs lesion), which is both a cause and the consequence of the recurrent dislocation. The most important dynamic stabilizer of the head of the humerus, the subscapularis, is stretched after the initial traumatic dislocation. Hence its action is weakened and this leads to muscle imbalance, resulting in outward rotation of the head, leading to further stretch of the muscle and as a result recurrent dislocation. Modified Boytchev's procedure, well addresses the problem of this weakened subscapularis.

In modified Boytchev's procedure, the rerouted conjoint tendon which is passed deep to the subscapularis and reattached at its original anatomical location, acts as a dynamic brace over antero inferior aspect of the shoulder joint. In recurrent dislocations, the limb is vulnerable in the position of abduction and external rotation, when the head is pushed out of the glenoid. The rerouted conjoint tendon increases tension in the subscapularis and reinforces the anterior muscular support and it prevents the superior displacement of the subscapularis and thereby prevents the dislocation.⁶⁻¹⁵ The rerouted conjoint tendon between the head of the humerus and subscapularis, also exerts a pressure effect on the subscapularis tendon, thereby increasing the proprioceptive stimulus in the tendon, which increases the protective reflex to prevent the dislocation. The other advantages of modified Boytchev procedure are, this is an extra articular procedure, with a very low recurrence rate, lower complication rate, lower re-operation rate, less intra operative time, maintains reasonably good range of abduction and external rotation, and the procedure is easy to perform. It is also cost effective.

The disadvantage is that, since the procedure is extra-articular, the intra-articular pathology like Hill Sachs' lesion and cartilage defects cannot be visualized and addressed.

When compared to arthroscopic surgeries, the recurrence rate is low, but at the cost of loss of some range of mobility. When compared to other open procedures where longer immobilization is needed, modified Boytchev offers more range of mobility, as the pendular exercises are being started early.

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The modified Boytchev procedure, if properly performed and being followed up with early active mobilisation, yields good results. If early mobilization is not followed, scarring and fibrosis occurs with wasting of musculature.

A well-developed subscapularis muscle is a pre-requisite for good results, as recurrent dislocation may occur with a weak or wasted muscle.

Though this is a small series and requires further follow up, we would like to conclude that modified Boytchev procedure is effective in managing the problem of recurrent anterior dislocation of the shoulder.

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Fig. 5: Post op X-ray



Fig. 6: Pre-op



Fig. 6: Post-op



Fig. 7: Pre-op



Fig. 7: Post-op



Fig. 8: Pre-op



Fig. 8: Post-op

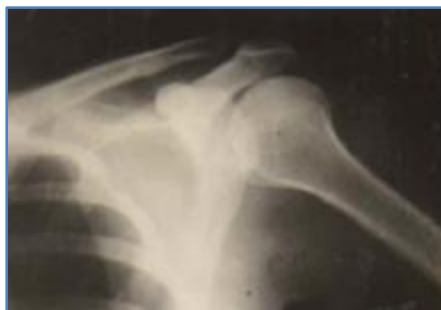


Fig. 9: Pre-op

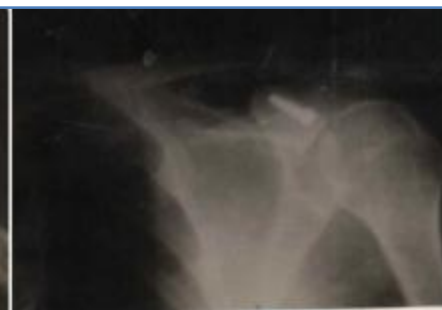


Fig. 9: Post-op

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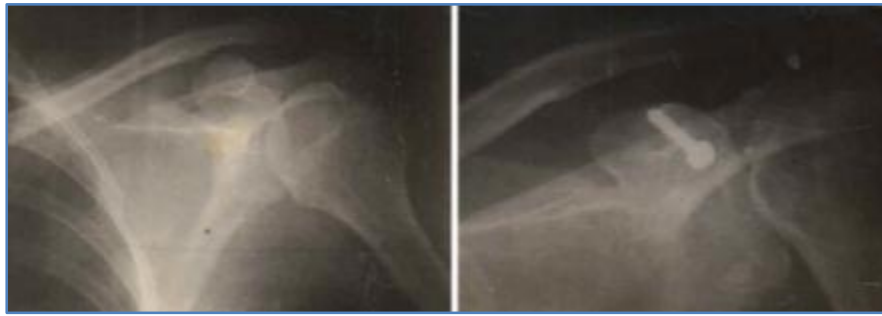


Fig. 10: Pre-op

Fig. 10: Post-op



Fig. 11: Pre-op

Fig. 11: Post-op



Fig. 12: Pre-op

Fig. 12: Post-op



Fig. 13: Pre-op

Fig. 13: Post-op

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Fig. 14: Pre-op

Fig. 14: Post-op



Fig. 15: Pre-op

Fig. 15: Post-op



Fig. 16: Pre-op

Fig. 16: Post-op

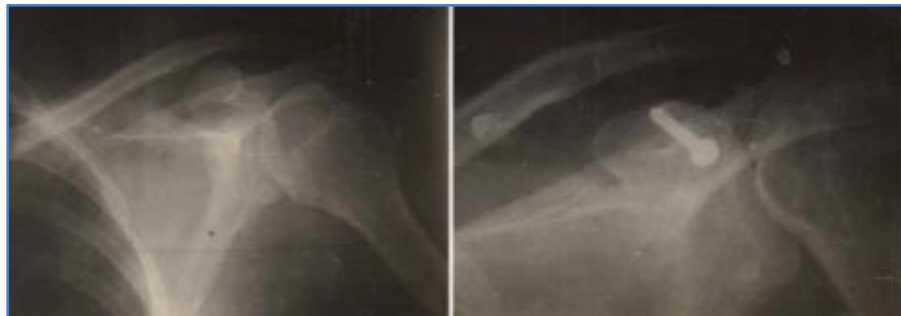


Fig. 17: Pre-op

Fig. 17: Post-op

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