



REVIEW ARTICLE

RECURRENT DISLOCATION OF SHOULDER: BOYTCHEV PROCEDURE – A REVIEW ARTICLE

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ABSTRACT

The management of recurrent dislocation of shoulder extends from the anterior scarification procedure of Hippocrates to the joint reconstruction. Here we used 2 tendons, excluding pectoralis minor, from the conjoint tendon of the shoulder and tunneled it through the upper 2/3rd and lower 1/3rd junction of subscapularis muscle which is attached to the coracoids process itself. The procedure showed awarding outcomes.

Key words:

Recurrent Dislocation
Boytchev Procedure
Modified Boytchev Procedure
Subscapularis Muscle
Conjoint Tendon

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INTRODUCTION

The management of recurrent dislocation of shoulder extends from the anterior scarification procedure of Hippocrates to the joint reconstruction. Several operative procedures with various results were published in the literature. "Eight cadaveric shoulders were tested with the arm in 90 degrees abduction and 90 degrees external rotation. A constant 1.5 kg anterior translation force was applied to the proximal humerus, combined with 0, 1.5, 3.0 kg of load applied to the conjoint tendon sequentially. Anterior displacement of the humeral head relative to the scapula was recorded before and after an imitation of Bankart lesion which was created, and after treated with the modified Boytchev procedure. According to L.S Jiang, Department of Orthopedic Surgery, Shanghai Jiaotong University, China. Application of load to the conjoint tendon significantly reduced anterior displacement of the humeral head either with the capsule intact or with Bankart lesion simulated (Lei-Sheng Jiang, 2007). Shibata Yozo (Yozo Shibata, 2004) and colleagues studied the pressure between the humeral head and subscapularis after modified Boytchev procedure with the help of a microtip catheter transducer. The modified Boytchev procedure increases the pressure between the humeral head and subscapularis.

The investigators postulated that this increased pressure increases proprioceptive stimuli in the subscapularis tendon and thus accelerates the protective reflex needed to prevent shoulder dislocation.

Operative (modified boytchev) procedure

The surgery is done under general anaesthesia. Patient is placed supine and the affected shoulder is elevated by placing a sand bag under scapula. The operating field was prepared with povidon iodine and spirit and carefully draped. The limb to be operated was separately draped to allow easy manipulation. Shoulder joint is approached through deltopectoral approach. Conjoint tendon of coracobrachialis and biceps are freed from coracoid process either by osteotomising the coracoid process or by resecting the conjoint tendon near to the coracoid process. Subscapularis muscle is identified and a tunnel is made through its upper 2/3rd and lower 1/3rd. The conjoint tendon is then passed through this tunnel and reattached to the coracoid process either with the help of a 4mm cancellous screw and a washer or sutured to the coracoid process with OS vicryl. Wound is then closed in layers over a suction drain after attaining haemostasis.

Boytchev Procedure

Boytchev (1902-1971) (Lei-Sheng Jiang, 2007) was a Bulgarian orthopaedic surgeon, who described his technique in

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1951 (Helfet, 1958). A musculotendinous flap, obtained by disinserting the origin of the short head of the biceps, the pectoralis minor and the coracobrachialis from the coracoid process, is passed under the subscapularis muscle and then reinserted with a screw. So the Boytchev technique is an active "belt" which prevents anterior displacement of the head of the humerus. Boytchev's technique comprises rerouting of the coracoid process with its attached conjoint tendons (short head of biceps and coracobrachialis) along with the pectoralis minor muscle deep to the subscapularis and reattachment to its anatomical location. Conforty used the conjoint tendons of the short head of biceps and coracobrachialis only, omitting the pectoralis minor muscle. Satisfactory results were reported in 1980 and later by Ha'Eri, but none reported their long term follow-up. The objective of this study is to evaluate the modified Boytchev procedure (Hill, 1940).

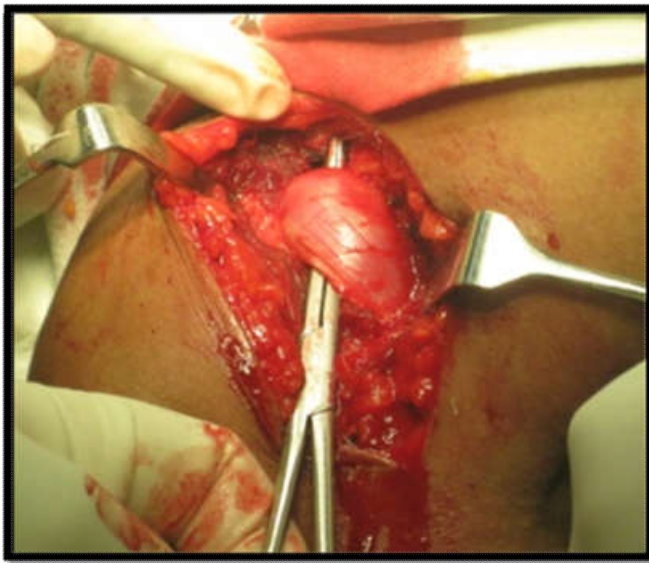


Fig. 1. Conjoint tendon is identified released and separated

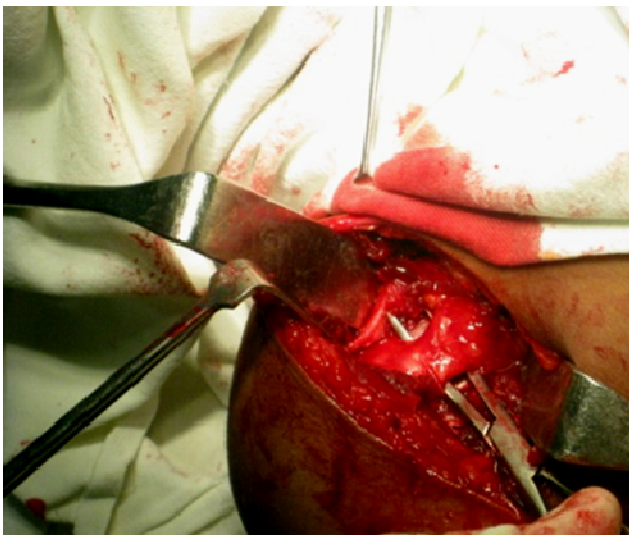


Fig. 2. Split in Subscapularis muscle created

Modified Boytchev procedure

Our team limited the rerouting to the coracobrachialis and to the short head of the biceps, so that only muscle fibers with a single direction were used. We also made a tunnel through the upper 2/3rd and lower 1/3rd of subscapularis muscle through

which the conjoint tendon is passed and reattached to the coracoid process with a 4 mm cancellous screw or OS vicryl. Whereas in original Boytchev technique the conjoint tendon is passed posterior to the whole, subscapularis muscle. This may result in anterior displacement of subscapularis muscle, which is an important stabilizing structure of shoulder, hence, our modification. Jiang and colleagues investigated the dynamic contribution of the conjoined tendon in both stable and unstable shoulders.

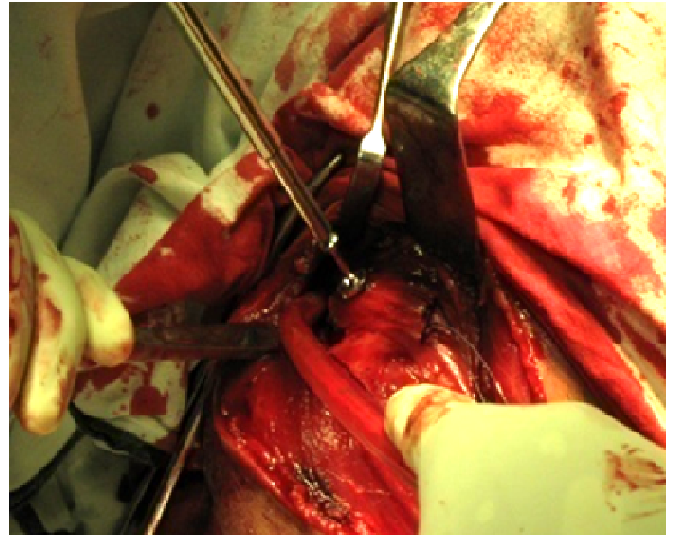


Fig. 3. Fixed with 1, 4mm cancellous screw and washer



Figure 4. Post op 6 weeks – screw with washer in situ

DISCUSSION

Conservative Measures

The mainstay of conservative measures in recurrent dislocation of shoulder is to prevent excessive abduction, external rotation and extension. Nicole (1984) and Moseley (1959) described various supports in this regard.

While wearing such supports a definite programme of exercises is necessary to maintain the musculature in the best possible condition.

Operative Procedures

The surgical procedures for recurrent anterior dislocation of shoulder are based on two principles : either passive control of humeral head with capsular repair, like in the Bankart procedure, or active control, in which the muscle power prevents redislocation, as in the Bristow procedure / Boytchev procedure. More than 150 operations and many modifications of some have devised to treat recurrent anterior dislocation of the shoulder. The pathologic condition varies from person to person so also the needs and demands of the patients.

Bankart Operation

In Bankart operation the detached glenoid labrum and anterior part of the capsule are reattached to the rim of the glenoid cavity with sutures passed through holes in the glenoid rim. The subscapularis muscle is separated from the anterior capsule by blunt dissection. It is then divided near its musculotendinous junction. Expose the joint by making an incision in the capsule about 5 cm long, 6mm lateral to the rim of the glenoid. With an osteotome roughen rim of the glenoid. Four drill holes are made over the glenoid rim. Suture the free margin of the lateral part of the capsule to the roughened glenoid rim with shoulder in internal rotation. This brings the edge of the capsule to the raw bone of the glenoid rim. The medial part of the capsule may be overlapped and suture in place. Then suture the subscapularis tendon (Helfet, 1958).

Putti-Platt Repair

This repair leaves the patient with less external rotation, which if forced, may damage the repair. In the Bankart procedure, the subscapularis muscle and tendon are separated from the underlying joint capsule. In the Putti-Platt procedure, the incision is carried down directly through the subscapularis muscle and capsule into the joint. Overlapping and double-breasting are then carried out by internally rotating the arm and attaching the lateral stump of the subscapularis muscle and capsule to the anterior rim of the glenoid or the periosteal tissue of the scapular neck. The medial stump of the subscapularis muscle is then double-breasted over this repair and attached to the lesser tuberosity or bicipital groove (Campbell's.).

Gallie-le mesurier procedure: It is based on the construction of a "new ligament" using fascia lata to reinforce the anterior capsule and Glenohumeral ligament.

Hybbinette-eden procedure: Initially tibial autografts were filled in the glenoid fdefects but noe cortico cancellous bone autografts harvested from iliac crest is used. It is fixed to the the glenoid defects with the help of screws. The technique can also be used effectively on the posterior glenoid rim for recurrent posterior dislocations of the shoulder.

Magnuson-Stack Repair: The repair was designed to form a "cup of muscle or tendon around the lower and anterior part of the head of the humerus" and to eliminate the imbalance of the subscapularis muscle when the arm is elevated at the shoulder. Stability of the shoulder after this procedure may depend on limitation of external rotation.

Nicola Procedure: Here by transplanting the long head of the biceps through the humeral head a suspension is produced.



Fig 5, 6, 7 and 8 showing the range of movements after 6 months of follow up

Dickson Procedure: The Dickson procedure is another technically easy procedure amid may be used for the same indications described for the Nicola operation. Reports to date vary as to its long-term effectiveness.

Mosely's Vitallium Prosthesis: Mosely devised a vitallium rim usually fixed with 2 screws to reconstruct the damaged anterior glenoid rim. the prosthesis is extra articular in position and in no way should impinge on the humeral head.

Bristow Procedure: Helfet (1958) described the Bristow procedure. May (1970) modified the Bristow operation. In this procedure, the coracoid process is transplanted with the attached conjoined tendons of the short head of biceps and coracobrachialis to the anterior rim of glenoid and fixed with a screw. It is also utilized to reinforce the anterior capsulomuscular wall in combination with other procedures, usually stapling of the detached anterior capsule and labrum (Inman, 1944 and Ivar,, 1940).

Conclusion

In the original Boytchev procedure 3 tendons (coracobrachialis, short head of biceps and pectoralis minor) are rerouted posterior to the whole subscapularis. Where as we modified the procedure by using only 2 tendons, excluding pectoralis minor, so that only unidirectional tendons are used. Then tunneling of conjoint tendon through the upper 2/3rd and lower 1/3rd junction of subscapularis was used here making use of the advantage of preventing anterior displacement of subscapularis which is an important anterior stabilizing structure of the shoulder.

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