Journal of Orthopaedics 14 (2017) 313–318

Contents lists available at ScienceDirect

Journal of Orthopaedics

journal homepage: www.elsevier.com/locate/jor

Original Article

Clinico-radiological evaluation of retear rate in arthroscopic double row versus single row repair technique in full thickness rotator cuff tear

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ARTICLE INFO

Article history:
Received 2 January 2017
Accepted 6 January 2017
Available online 3 May 2017

Keyword:
Rotator cuff tear
Single row repair
Double row repair
Retear

ABSTRACT

Background: Rotator cuff tear is most troublesome issue in shoulder surgery. Retear is seen in arthroscopically repaired rotator cuff tear.
Purpose: The functional outcome and retear rate in primary full thickness rotator cuff tear operated by single and double row repair technique.
Methods: 56 cases with full thickness tear of rotator cuff operated by single or double (28 each) were studied. Retear rate is evaluated after at least 6 months after surgery.
Results: There was a statistical difference in retear rate between double row and single row repair (p value <0.01).
Conclusion: Retear rate is low in double row repair technique.

1. Introduction

The purpose of surgery in full thickness rotator cuff tear is to achieve anatomical footprint of the rotator cuff and to relieve pain and restore shoulder function. The integrity of repair site is shown to correlate with clinical improvement, particularly return of strength. Open repair was commonly practiced but recently arthroscopic repair is widely accepted with equal or better results.[1] Retear may occur even after arthroscopic rotator cuff repair due to poor quality of tissue, poor pull out strength of anchor, suture breakage and inappropriate rehabilitation. In 2004, Galatz[24] reported high incidence of retear rate in arthroscopically repaired rotator cuff. The double row repair method has shown to restore anatomical footprint of rotator cuff and also achieves better healing.[9] The purpose of this study is evaluate retear rate in single and double row repair method. The purpose of this study is to evaluate retear rate and to assess functional outcome of both repair techniques.

2. Methods

Among patients who had undergone arthroscopic repair for the treatment of full thickness rotator cuff tear 56 patients were enrolled for the study.

Computer based randomization of cases was done which consisted of 28 cases of each single and double row repair method. All patient had routine follow up for 6 months after surgery. Preoperative clinical scoring and MRI of affected shoulder is done which is a routine part of management in our hospital. Post surgery clinical scoring at 3 and 6 months is done by UCLA and ASES.[10] Post op MRI is done at the end of 6 months. It is a prospective type of study. All patients in 30–70 year age group with full thickness rotator cuff tear who have undergone single or double row repair technique and willing to participate in study are included. Patient with SLAP tear, revision surgery, symptomatic acromioclavicular joint arthritis, cuff tear arthropathy, biceps tendon pathology and adhesive capsulitis are excluded. History was elicited from patients regarding age, sex duration of pain, side, hand dominance and loss of function. Patients were clinically examined for range of movement, strength of rotator cuff muscles, etc. Preoperative UCLA and ASES were documented for all patients. Physical examination consisted of measurements of range of motion and manual muscle strength test. The range of motion assessment included measurement of forward flexion in sagittal plane and strength of forward flexion. Jobe's empty can test was used for assessment of supraspinatus: In this test, the arm is placed in 30° of forward flexion and 90° of abduction in plane of scapula with the elbow fully extended and thumb pointing down (empty can) towards floor. The patient is asked to raise the arm against resistance applied by the examiner over the forearm. If the arm flops down with pain, it is indicative of rotator cuff tear. This is often referrred to as "Drop arm sign" and though diagnostic of full

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http://dx.doi.org/10.1016/j.jor.2017.01.001
0972-978X/

thickness rotator cuff tear. It is occasionally seen severe inflammation of cuff and large partial cuff tear. Jobe's full can tear was also used for assessment of supraspinatus. In this, the same test is repeated with the thumb pointing up towards ceiling. The deltoid shares the load of the supraspinatus and it is performed with ease. In the presence of a full thickness tear both the empty can and full can test will be positive. In supraspinatus tendinitis, calcific tendonitis and partial tears of rotator cuff full can test will be negative. The full can test is more specific for the diagnosis of a full thickness tear. Resisted external rotation tests were used for infraspinatus and teres minor together. In this test, patient is asked to tuck the elbow near his waist in 90° of flexion at the elbow and rotate the forearm externally against the resistance. Radiological evaluation consists of pre-op radiological evaluation involved true AP view and MRI of involved shoulder. Final diagnosis was done on the basis of intraoperative findings. Repeat MRI is done at the end of 6 months for retear. Assessment scores consists of UCLA and ASES scores (Figs. 1 and 2).

Surgical technique:

1. Double row repair
2. Single row repair

2.1. Operative procedure

All the procedures are performed by the same surgeon under regional or general anesthesia, with the patient in the floppy lateral position. In both groups posterior, anterior and 2 lateral portals are established for each patient. The posterior portal is used as the viewing portal; the anterior portal and the lateral portals are used as the working portals. Posterior portal is used to locate position of tear with scope. Shoulder joint is visualized through anterior portal. Shaver is used for freshening margins of tear. Briefly, for single row repair knotless suture anchor are placed in the greater tuberosity. Sutures are passed through the cuff with a suture passer and tied with a simple knot and a mattress knot for each anchor. Double row repair is performed according to the "double row pulley technique". Briefly, suture anchors are placed very close to the articular cartilage to form the medial row. Then, threads are passed through the cuff with a suture passer, and thread of one color are tied together with a simple knot and an outside-in knot. One thread of the other color is retrieved from each anchor, placed into a self-locking anchors and fixed to the anterolateral part of the greater tuberosity.

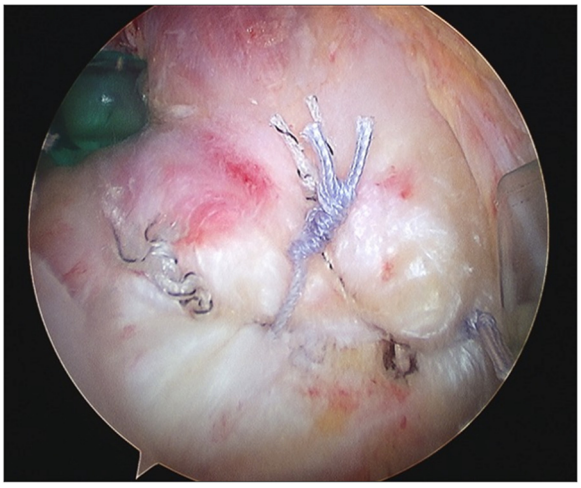

Fig. 1. Arthroscopic image of double row rotator cuff repair.

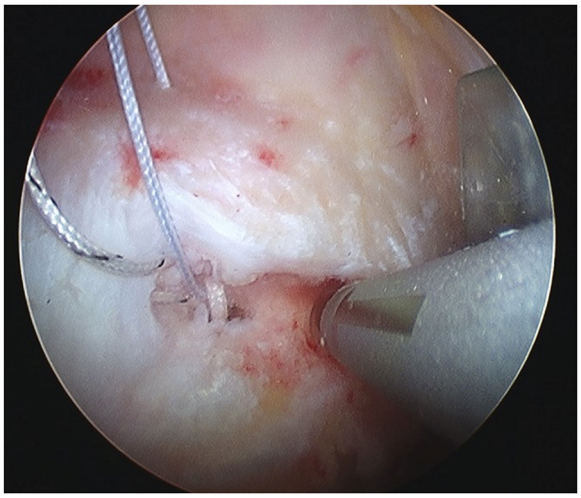

Fig. 2. Arthroscopic image showing placement of anchors.

The same procedure is repeated with the last two thread that are fixed with a self-locking anchors to the posterolateral aspect of the greater tuberosity. For both single row and double row repair, only one strand of the suture is passed on the tendon at each time so as to avoid creating large holes through the cuff.

2.2. Postoperative protocol

All the patients followed the same postoperative protocol lasting about 6 months. Briefly, they wore a brace 24 h a day with the operated shoulder at 15° of abduction and in neutral rotation. During this early phase, bracing was discontinued only for bathing or taking a shower. Subsequently, a scheduled program of passive physical therapy 2–3 times a week was started. Only after complete passive range of motion had been achieved, active assisted exercises and progressive muscle strengthening were begun. Patients returned to their normal activities of daily living 3–6 months after surgery.

2.3. Consent

Consent will be taken a day before surgery. Patient will be explained about the study procedure orally and in writing, in a language best understood by them, and signed consent obtained. Details shall be collected according to a defined format of questions and examination, administered by the investigator.

3. Results

3.1. Sample size

The sample size is calculated using method described by DuPont and Plummer (1990) for continuous response measures in 2 independent groups. We are planning a study of a continuous response variable from independent control and experimental subjects with 1 control(s) per experimental subject. In a previous study the response within each subject group was normally distributed with standard deviation 5. If the true difference in the experimental and control means is 5, we will need to study 22 experimental subjects and 22 control subjects to be able to reject the null hypothesis that the population means of the experimental and control groups are equal with probability (power) 0.9. The Type I error probability associated with this test of this null hypothesis is 0.05.