



Short communication

Functional outcome of partial arthroscopic repair for massive rotator cuff tears

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ABSTRACT

Background: Despite advancement in arthroscopic techniques, surgical management of massive, irreparable rotator cuff can be difficult and demanding. Hence different surgical options like debridement, cuff augmentation, partial repair, tendon transfer, reverse shoulder arthroplasty or in space balloon spacer following failure of non-operative treatment have been described in literature.

Aim: To evaluate functional outcome following arthroscopic partial repair in patients with pseudo paralysis as result of massive irreparable rotator cuff.

Material and Methods: Retrospective review 19 patients with arthroscopic partial repair for massive rotator cuff tear performed. The diagnosis of massive cuff tear was confirmed in all patients during arthroscopic evaluation. Arthroscopic partial cuff repair was performed if watertight repair not possible in all cases to restore the insertion of the cuff above the equator. The postoperative scores were recorded by a postal questionnaire.

Results: There were 13 male and 6 female in this group with an average age of 60.4 years. Average follow up was 10.42 months (3–24 months). At follow up 14/19 (73%) had more than 90° forward flexion, abduction and 4/19 had external rotation greater than 45°. Postop scoring was available in 11 patients with average oxford score 33.3 (19–44) and Quick DASH score of 22.16 (2.3–63.6). Pain levels were improved in all 11 patients who completed the questionnaire. Preoperative pseudo paralysis was improved in 82.3% patients (14/17). We had 2 patients presenting with re rupture 8 and 20 months respectively. None of the patients had reoperation within 2 years of primary procedure.

Conclusion: Functional partial repair can restore the shoulder biomechanics. The Partial cuff repair along with robust deltoid rehabilitation is a reliable procedure with good functional outcome.

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1. Introduction

The aim of rotator cuff repair is to re-establish the attachment of the torn tendon to the humeral tuberosity. When this is achieved via a complete repair, favorable outcomes have been documented.^{1–5} However even with a complete repair, some series report failure occurring in up to 90% of cases.^{6,7}

Approximately 1 in 25 patients undergoing rotator cuff repair surgery undergo revision surgery in the following year.⁸ Despite this potentially high number of failed repairs, several studies have found that patient reported outcome were improved whether or not the repair successfully maintained the integrity of the rotator cuff.^{9–13}

The demonstration of improved pain and function despite lack of cuff integrity is an important factor to consider when managing patients with large, irreparable tears. According to literature several treatment options including simple debridement, partial repair, tendon transfer, biologic augmentation and reverse shoulder arthroplasty have been widely used for an irreparable large to massive cuff tear. Management options take into account the patient's age, comorbidities, activity level, and general physical demand. Massive tears, severe retraction combined with poor tendon quality and fatty infiltration occasionally preclude complete repair of the torn tendon to its native footprint. Attempting to mobilise laterally and repair the apex of a retracted tear to a lateral bone bed will often result in high tensile overload and subsequent failure.¹⁴ Hence if complete watertight repair cannot be accomplished then a functional partial repair may be possible.^{2,15–18}

Burkhart coined the phrase 'functional rotator cuff tear' which describes a tear that is anatomically deficient yet biomechanically

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intact, resulting in a more balanced shoulder with resultant improved function.¹⁵ He described the biomechanical rationale of the 'suspension bridge system'. This model describes how partial rotator cuff repair attempts to re-create the transverse force couple of the rotator cuff through the concept of margin convergence. This can reduce the overall tension of the anterior and posterior tear leaves and provide a stable fulcrum for the glenohumeral joint. Thus patients with functional rotator cuff tears may have near normal function despite persistent defects in the rotator cuff.^{14,15}

2. Materials and methods

In this retrospective study, we included 19 consecutive patients treated with arthroscopic partial repair for massive cuff tear. All the procedures were performed under supervision of the senior author over a period of three years (2011–2014). Following approval by trust audit committee, we retrieved patient information from electronic database, hospital records. Preoperative scores in the form of Quick DASH and Oxford were available for six patients while postoperative scores were obtained from ten patients. Pre and postoperative ROM were recorded from clinic records. Preoperative radiographs were assessed to identify any element of gleno-humeral arthritis. Pre-op MR scans were available in fourteen patients while five had an ultrasound scan to identify the nature of tear. Massive cuff tears with absence of arthritis who failed three months of pre-operative rehabilitation and were unable to forward flex and abduct beyond 90° were listed for arthroscopic cuff repair. We used postal questionnaire to evaluate the satisfaction and functional outcome following partial repair.

2.1. Surgical technique

All patients underwent arthroscopic procedure in a beach chair position under the care of the senior author. Following assessment

of cuff tear, thorough mobilisation of cuff was performed including release of adhesions and appropriate dermal slides. Standard preparation of footprint was performed with the help of shaver (Fig. 1). The partial repair was performed only if tension free watertight repair could not be achieved. The partial repair was performed to get the anterior and posterior cuff above the equator (Fig. 2 and 3).

2.2. Post-operative rehabilitation

Patients were discharged on the same day with a sling for comfort. Early mobilisation was carried out with closed chain exercises commenced on the same day and a deltoid rehabilitation programme.

3. Results

There were thirteen male and six female patients in this cohort with an average age of 60.4 years (42–81). Dominant side was involved in 71% of patients. Out of those, fourteen patients with pre-operative MR scan, Goutellier stage IV was identified in eight and III in six patients.

At a mean 10.42 months follow up fourteen of nineteen (73%) patients had more than 90° forward flexion and abduction and of these five (36%) achieved abduction and forward flexion beyond 145°. Four patients (21%) achieved external rotation greater than 45°. Pre-operative pseudo paralysis improved in 82.3%. The average oxford score was 33.3 (19–44) and Quick DASH 22.16 (2.3–63.6). Pain levels were improved in all eleven patients who completed the questionnaire. All patients felt better than the pre-operative state, 16% returned to the same occupation and 67% had no pain at night. There were no repair related complications recorded. None of these patients had further procedure within the follow-up period. Two patients presented with re-rupture 8 and 20

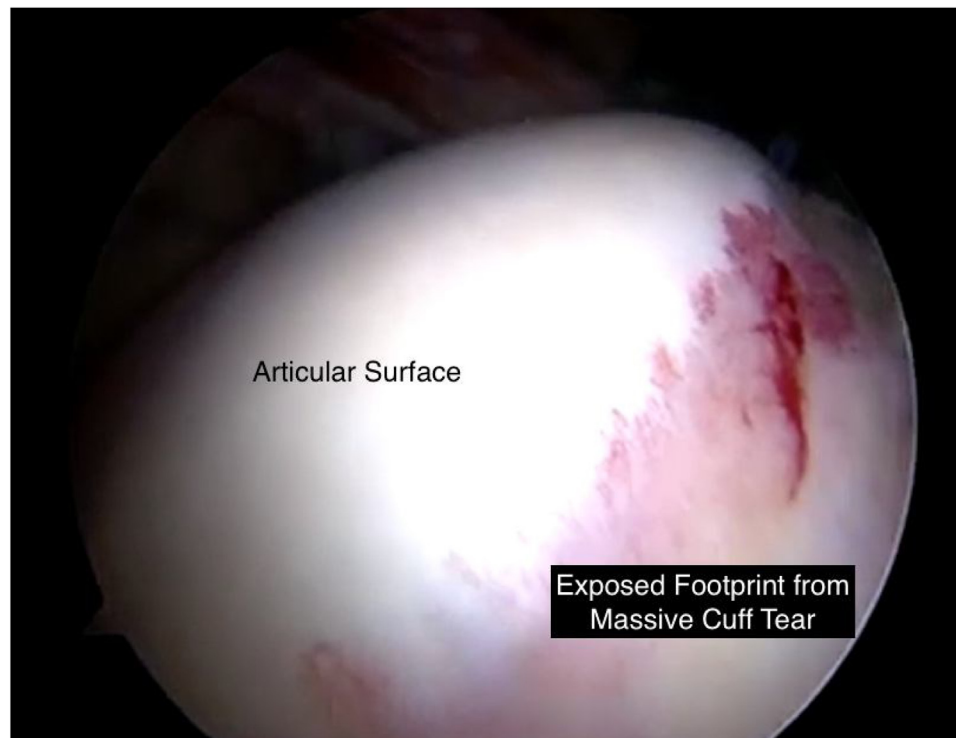


Fig. 1. Intra-op Arthroscopic view of massive cuff tear with exposed footprint.

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