

# Arthroscopic Side-to-Side Rotator Cuff Repair

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**Purpose:** To study the results of arthroscopic repair of full-thickness rotator cuff tears using a side-to-side suture technique without fixation to bone. **Type of Study:** Case series study of the long-term results of patients who underwent purely arthroscopic rotator cuff repair with a side-to-side suturing technique. **Methods:** A retrospective review was performed of patients who underwent arthroscopic repair of full-thickness rotator cuff defects. Patients with full-thickness rotator cuff tears repaired in a side-to-side fashion without anchoring the repair to bone were selected. Patients were evaluated using a modified UCLA shoulder scoring system. The data collected were analyzed to determine the outcome in patients with a 4- to 10-year follow-up. **Results:** A total of 105 arthroscopic rotator cuff repairs were performed in 104 patients between February 1990 and February 1996. Forty-two patients had a full-thickness tear of the rotator cuff that was repaired using a purely side-to-side suturing technique. The mean UCLA score of all patients in this group was 33; 23 patients reported excellent results, 18 good results, and 1 poor result according to the UCLA scoring system. **Conclusions:** In this series, 98% of patients qualified as a good to excellent result according to the UCLA shoulder score. This study shows that patients with a full-thickness defect of the rotator cuff tendon with anatomy amenable to side-to-side closure may be effectively treated with a purely arthroscopic repair using only a side-to-side suturing technique with excellent long-term clinical results. **Level of Evidence:** Level IV. **Key Words:** Side-to-side suture repair—Rotator cuff tear.

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Other surgeons have reported the results of arthroscopic repair of full-thickness defects of the rotator cuff.<sup>1-7</sup> These studies support the use of arthroscopy in the treatment of symptomatic rotator cuff tears recalcitrant to nonsurgical management. As a result of these reports of successful postoperative outcomes, purely arthroscopic methods to repair full-thickness tears of the rotator cuff are being increasingly used. Proponents of the arthroscopic treatment of rotator cuff pathology cite less morbidity to the surrounding soft-tissue envelope, no deltoid detachment, better visualization of the pathology of the rotator cuff, and an accelerated postoperative rehabilitation period with a lower incidence of postoperative stiffness.<sup>6,7</sup>

Surgical treatment of full-thickness rotator cuff defects has focused on recreating the anatomy of the intact rotator cuff with reinsertion and fixation of the tendon to the greater tuberosity of the humerus. Previous authors have presented open and arthroscopic repair techniques that involve recognition of the tear configuration and use a side-to-side repair as a component of the rotator cuff repair.<sup>2,3,8,9</sup> To date, all reports of purely arthroscopic repair of the rotator cuff have involved securing the repair to the proximal humerus with either suture through bone tunnels or with anchor-based fixation. This article is unique in that we report the results of repairs of full-thickness defects of the rotator cuff with a purely arthroscopic side-to-side technique without anchoring the repair to bone. This repair technique was performed in tears that appeared amenable to this type of repair after thorough arthroscopic visualization and evaluation.

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## METHODS

The results of 105 consecutive arthroscopic rotator cuff repairs in 104 patients performed by the senior

author (E.M.W.) over a 6-year period between February 1990 and February 1996 were evaluated. Initially, a retrospective clinical chart review was performed for each case. Nine patients were lost to follow-up, leaving 96 shoulders in 95 patients available for evaluation with an average follow-up of 73 months (range, 48 to 120 months). Forty-two of these patients who underwent repair of a full-thickness rotator cuff tear in a side-to-side fashion without anchoring the repair to bone were selected for this study. There were 24 male and 18 female patients, and the average age at the time of surgery was 59.8 years (range, 42 to 79 years). All patients had been recalcitrant to conservative therapy and continued to experience unacceptable pain and weakness in the affected shoulder.

All patients were clinically evaluated by the senior author. Final outcome assessment was performed by an independent surgeon (W.T.P.) by telephone. Each patient was contacted to assess for pain, function, range of motion, strength, return to work date, and perceived success of the procedure. Outcome was evaluated using a modified UCLA shoulder rating scale<sup>10</sup> (Table 1). This scale designates 10 points each for pain and function and 5 points each for active forward flexion, strength of forward flexion, and patient satisfaction, for a total possible score of 35. Good and excellent results (total UCLA score 28-35 points) are considered satisfactory and fair and poor results (less than 28 points) are considered unsatisfactory.

Eighty-one percent of patients had repairs of their dominant shoulder, with 33 right and 9 left repairs. All patients also had arthroscopic subacromial decompressions. Seven patients had other procedures performed concurrently, including 3 arthroscopic Mumford procedures, 1 SLAP lesion debridement, 1 debridement of a biceps tendon rupture, and 2 os acromiale excisions.

### Surgical Technique

Routine shoulder arthroscopy was performed with the patient in the lateral decubitus position. Initially, the glenohumeral joint was inspected to evaluate for any significant intra-articular pathology. The cuff was inspected from the articular side and the defect in the rotator cuff tendon was debrided of all frayed, devitalized tissue. The arthroscope was reconfigured into the subacromial space and a decompression was performed using a cutting-block technique. It is important to remove all bursal tissue covering the rotator cuff to be able to evaluate the extent of the tear. The bursectomy was also necessary to provide enough visualiza-

**TABLE 1.** *Modified UCLA Shoulder Rating Scale*

Patient satisfaction	
0	Patient feels procedure was not successful
5	Patient feels procedure was a success
Active forward flexion range of motion	
0	Less than 30°
1	30°-45°
2	45°-90°
3	90°-120°
4	120°-150°
5	Greater than 150°
Strength of forward flexion	
0	No active contraction
1	Evidence of slight muscle contraction, no active elevation
2	Complete active forward flexion with gravity eliminated
3	Complete active forward flexion against gravity
4	Complete active forward flexion against gravity with some resistance
5	Complete active forward flexion against gravity with full resistance
Pain	
1	Present always and unbearable, strong medication frequently
2	Present always but bearable, strong medication occasionally
4	None or little at rest, present during light activities; salicylates frequently
6	Present during heavy or particular activities only, salicylates occasionally
8	Occasional and slight
10	None
Function	
1	Unable to use limb
2	Only light activities possible
3	Able to do light housework or most activities of daily living
6	Most housework, shopping, and driving possible; able to do hair and to dress and undress, including fastening brassiere
8	Slight restriction only, able to work above shoulder level
10	Normal activities
Total	
	Excellent: 34-35
	Good: 28-33
	Fair: 21-27
	Poor: 0-20

tion of the cuff and of the suture hooks used in the repair. The region of the greater tuberosity of the humerus was abraded with a full-radius shaver and burr to create a bed of bleeding bone to promote healing of the cuff to the tuberosity. The mobility of the rotator cuff was evaluated with a grasper or nerve hook. Each tear was assessed individually and repaired with "L" or "V-Y" techniques. All repairs in this report were performed arthroscopically using a side-to-side technique without fixation of the repair to bone. All tears in this series were evaluated with a nerve hook with an attempt to evaluate the anatomic relationship between the margins of the torn cuff

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