

Original article

Outcome of Arthroscopic Rotator Cuff Repair at Maharaj Nakorn Chiang Mai Hospital: A Review of the Surgery Results

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Abstract

Objective To review results the of arthroscopic rotator cuff repair at Maharaj Nakorn Chiang Mai Hospital.

Methods Forty two patients, with a median age of 57.2 years, were evaluated for daytime and nighttime pain by using the VAS score after undergoing arthroscopic rotator cuff repair with a follow up period of more than 6 months. Range of motion was recorded before and after surgery to evaluate the result. Subjective and functional outcomes were assessed by using the Simple Shoulder Test (SST) and UCLA score. Patients were interviewed also for their satisfaction of the surgery results.

Results The VAS score for daytime pain reduced significantly from 7.35 to 0.92. Forward elevation significantly improved from 136.79° to 171.31°, postoperatively. Abduction also improved from 117.74° to 166.45° after surgery. The mean UCLA and SST score was 29.33 and 9.55, respectively at six months. When using the criterion of UCLA score ≥ 27 , 80.90% of the patients were classified as having good to excellent results. After 6 months, all of the patients (100%) were satisfied with the results of surgery.

Conclusion All endoscopic rotator cuff repair at Maharaj Nakorn Chiang Mai Hospital had favorable outcomes with comparable results to other series. Due to its advantageous ability to assess the articular pathology, improve rotator cuff release, improve visualization of subacromion space, and create faster recovery compared to the conventional open technique, this method should become one of the standard treatments of rotator cuff conditions. **Chiang Mai Medical Journal 2011;50(4):105-114.**

Keywords: Rotator cuff tear, Arthroscopic surgery, Arthroscopic rotator cuff repair, shoulder pain

Shoulder pain is one of the most common presenting symptoms of patients referred to orthopedic surgeons. In the past, it was thought of as the dark side of the moon. Most cases were diagnosed as frozen shoulder and treated conservatively. Codman⁽¹⁾ described the pathology and treatment for diseases of the rotator cuff tendon. Since then, various methods of treatment have been developed.^(2,3) With the subtle physical examination and modern investigation, such as magnetic resonance (MR) imaging, accurate diagnosis can be achieved. Rotator cuff tear is one of the most common conditions causing shoulder pain in the elderly. Surgical treatment should be conducted in a full thickness retracted tear or cases that failed to respond to conventional conservative treatment. Choices of surgical treatment range from conventional open surgical repair to arthroscopic assisted repair combined with mini-open repair or that which can be performed as full arthroscopic repair. With the innovation of equipment and new surgical techniques, full arthroscopic repair is feasible. We hereby report the first series of all arthroscopic rotator cuff repairs at Maharaj Nakorn Chiang Mai Hospital.

MATERIALS AND METHODS

Between January 2006 and June 2010, forty nine patients diagnosed as rotator cuff tear were operated on by the first author (CP). The inclusion criteria for this review were as follows:

1. Patients diagnosed as rotator cuff tendon (supraspinatous, infraspinatous and subscapularis tendon) tear.
2. Complete medical records available for review.

3. Patient compliance for subjective evaluation and answers to the questionnaire.

4. Follow up period of at least 6 months.

Patients with osteoarthritis and labral lesion were excluded from this study, and those who had a follow up period of less than 6 months or needed to convert to open surgery were also excluded. We used the classification by Deorio and Cofield⁽⁴⁾ to classify the pathology.

Surgical technique

All procedures for inpatients of the first author (CP) were performed under general anesthesia. Patients laid in a semilateral decubitus position (Fig. 1). Skin traction was applied to the side involved with a weight of 3-5 kilograms. Standard posterior, anterior, posterolateral and lateral portals were used routinely (Fig. 2). On occasions, an extra portal was made for the purpose of placing a suture anchor, in order to obtain a proper angle to the bone for the optimal stability of the anchors. The posterior portal was used initially for evaluating intraarticular patho-



Figure 1. Showed the patient lying in semilateral decubitus with the approach of shoulder arthroscopy through posterior portal.

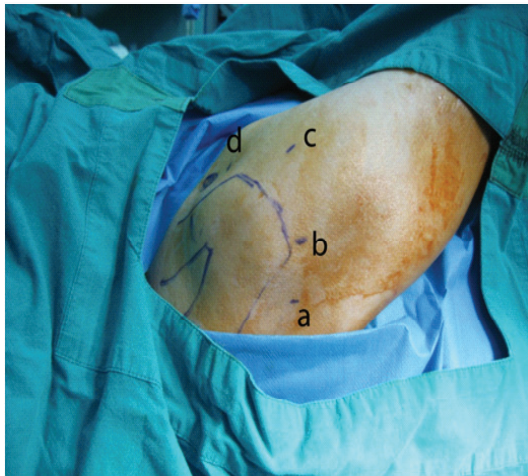


Figure 2. Portals for routine procedure of arthroscopic rotator cuff repair (a) posterior portal, (b) posterolateral portal, (c) lateral portal and (d) anterior portal

logy. An arthroscope was then moved to the subacromial space in order to perform subacromial decompression. A shaver was used to debride the subacromial bursa. The coracoacromial ligament was released from the anterior edge of the acromion. If a hooked acromion was found, it would be smoothed by using a motorized blur. After the subacromial decompression, the arthroscope was switched to posterolateral portal position for viewing during rotator cuff repair. This portal increased visualization to more 3 dimensional appearances, as observed from an oblique rather than true posterior view. For better healing, we refreshed the tendon by debriding the end of the tendon. We also used the blur to create a bleeding footprint on the humerus. Suture anchors were then placed into the footprint. Tendon end was sewn and pulled back to reattach to its original insertion on the humeral bone (Fig. 3a, 3b).

Postoperative management

The arm was placed in an armsling. In some cases, when some residual tension remained after repair, an abduction sling was applied to keep the arm at approximately 20-30 degrees abduction. Passive forward elevation and external rotation were started the day after surgery. The exercise program was changed to active assistive exercise three weeks after surgery. Patients were allowed to perform active motion of the shoulder after 6 weeks and on until the twelfth week, at which point strengthening exercises began. Patients were scheduled to follow up after 3, 6, 12, 18 and 24 weeks. Annual follow up was scheduled for long term assessment.

During follow up, the patients were assessed for pain (daytime and nighttime) using the Visual analogue score (VAS), function and range of motion as well as their level of satisfaction with the Simple Shoulder Test (SST)⁽⁵⁾ and UCLA score.⁽⁶⁾ No routine ultrasound or MR imaging was performed unless there was suspicion of a re-tear. The SST comprised a series of 12 yes-no questions to measure the pain and function of the shoulder through assessing the patient's ability to perform 12 simple tasks with the affected shoulder. The maximum total score was 12 points, with the higher the score, the better the function. The UCLA score was used to evaluate the patient's pain, function, forward flexion, strength and satisfaction. These five items were rated on ordinal scales of different lengths and scoring points. The maximum total score was 35, with the higher the score, the better the shoulder function. The UCLA score and SST were chosen based on reproducibility, practicability, ease of use and ease of incorporation in clinical practice. We believed that they were the most responsive scoring systems, which accurately reflect the outcomes of surgery by

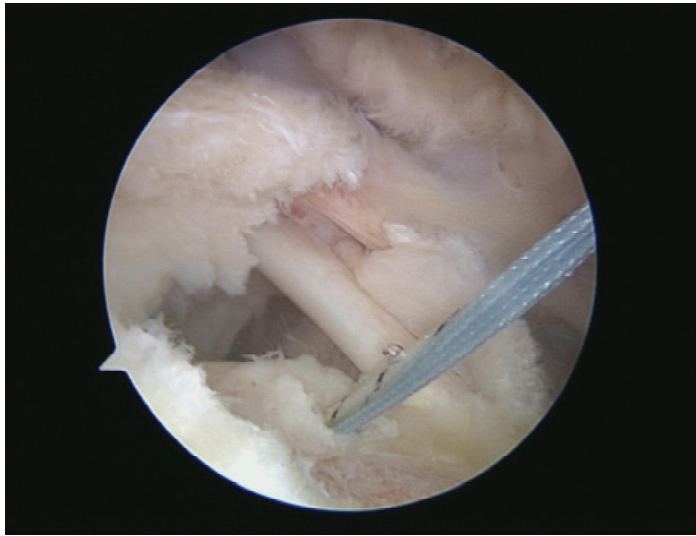


Figure 3a. Demonstration of suture anchor placed into humerus bone

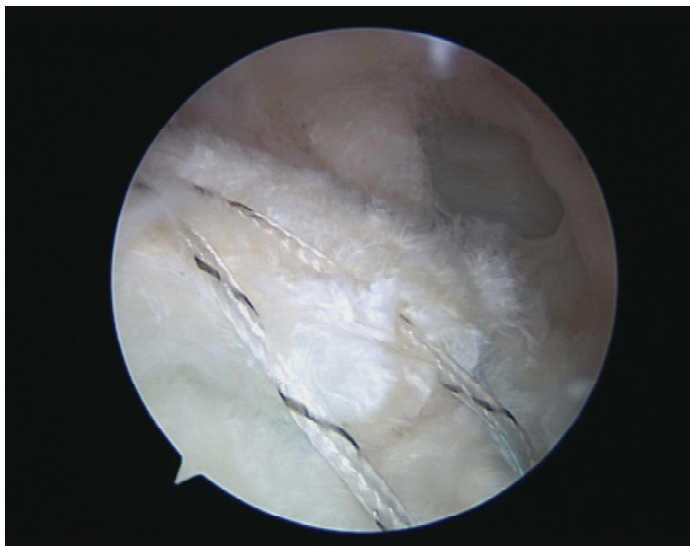


Figure 3b. Demonstrated picture of supraspinatus tendon after repaired

assessing the tasks patients are able to perform with the shoulder. At the final follow up, patients were asked if they were right in choosing surgery and whether they might have changed their mind from obtaining such treatment.

Statistical methods

All data including subjective evaluation were reported as mean (range, minimum-

maximum). Wilcoxon signed-rank test was used to analyze the preoperative and post-operative level of pain (VAS score) and motion range of the shoulder. The analysis was considered significant when p-values were less than 0.05. All statistical analyses were performed with STATA software version 10.0 (Stata Corp. LP, college station, Texas, USA).

RESULTS

Forty two of forty nine patients met the above criteria and were included in this study. Two patients with labral lesion, 2 with less than 6 months follow up and 3 who needed mini open incision to assist the repair were excluded from this review.

Twenty eight of 42 patients (66.7%) were female and 14 (33.3%) male; and their mean age was 57.02 ± 9.66 years (range 32-78 years) at the time of surgery. Arthroscopic repair was performed in 26 right shoulders and 16 left ones, i.e. 30 dominant and 12 nondominant arms. (Table 1)

Size of the tendon tear was categorized according to the classification by Deorio and Cofield⁽⁴⁾ as 1 small tear (< 1 cm), 32 medium tears (1-3 cm), 7 large tears (3-5 cm) and 2 massive tears (> 5 cm). All 42 cases had a torn supraspinatus tendon. Eight cases had an infraspinatus tear and 5 had a subscapularis tear. (Table 2)

Pain and VAS score

Overall, the patients experienced marked pain relief after the arthroscopic rotator cuff repair. The VAS score improved from 7.38 (± 1.83) preoperatively to 0.92 (± 1.34) postoperatively. Nighttime pain improved from 7.46 (± 2.04) preoperatively to 1.57 (± 1.63) postoperatively, which showed a statistically significant difference between preoperative and postoperative periods (p -value < 0.001).

Range of motion

There was a statistically significant improvement in range of motion (forward elevation and abduction) (p -value < 0.001). Overall, preoperative the mean forward elevation was 136.79° (± 35.37 ; range, 70-180),

Table 1. showed general geographic data of the patients

Characteristic	Data (N =42)
Age at surgery (years)	57.02 ± 9.66 (32-78)
Mean duration follow-up (months)	20.81 ± 3.55 (6-53)
Sex	
Male	14 (33.33%)
Female	28 (66.67%)
Dominant side involvement	
Yes	30 (71.43%)
No	12 (28.57%)

Table 2. showed operative findings: size of the tear and the involved tendon

Size of the tear*	
Small	1 (2.38%)
Medium	32 (76.19%)
Large	7 (16.67%)
Massive	2 (4.76%)

*Tear size groupings based on classification of Deorio and Cofield

Tendon torn	
Supraspinatus	42 (100.0%)
Infraspinatus	8 (19.05%)
Subscapularis	5 (11.90%)

which increased to 171.31° ($\pm 11.95^\circ$; range, 140-180) postoperatively. There was also a significant change of abduction from the preoperative 117.74° (± 39 , 54; range, 50-180) to the postoperative 166.45° ($\pm 15.47^\circ$; range, 130-180). External rotation showed no statistically significant change from 62.14° (± 18.01 ; range, 20-80) before surgery to 67.86° ($\pm 15.43^\circ$; range, 30-80) after surgery, with a P value = 0.055.

Simple Shoulder Test and UCLA score

The mean UCLA score was 29.33 (± 3.55 ; range, 23-35) at six months after surgery, and the SST score was 9.55 (± 1.9 ; range, 5-12) (Table 3). Thirty-four patients (80.95%) were graded as good to excellent outcome with a UCLA score ≥ 27 . Forty-two patients (100%) was satisfied with results of the surgery. All of them would not have changed their mind about choosing surgery as their treatment. There was no complication reported during the study.

DISCUSSION

In the past, rotator cuff tear was treated by the conventional open method with simple, unsophisticated instruments. It did not require arthroscopic equipment and arthroscopic skill. Conventional open surgery requiring detachment of the deltoid muscle from the acromion process for easy access slowed the recovery.^(7,8) With the current arthroscopic technique being developed, surgeons have started to use the arthroscope as a diagnostic tool to perform procedures such as subacromial decompression. Then

a mini incision is used to repair the torn rotator cuff tendon by splitting the deltoid muscle. However, the mini-open technique still had to split the deltoid muscle, which ran the risk of axillary nerve injury. After the evolution of new equipment, all arthroscopic rotator cuff repairs became standard procedure, which provided better access to intra articular lesions that were commonly associated with rotator cuff lesions,⁽⁹⁾ such as the superior anterior labral lesion (SLAP lesion), biceps tendon lesion or partial tear of the articular side of the supraspinatus tendon (PASTA Lesion). These conditions could be treated at the same time using the arthroscopic technique without having to open the shoulder joint. This procedure facilitates surgeons with better performance of subacromial decompression by improving visualization. In our case of retracted tendon, this procedure allowed release of the tendon from the deep medial part, which thus obtained better mobilization of the retracted tendon.

Arthroscopic procedure yielded favorable cosmetic results in terms of smaller wound and less postoperative pain.^(7,8) Patients had shorter hospital stay and faster rehabilitation. The procedure the decreased incidence

Table 3. showed the outcomess of arthroscopic rotator cuff repair.

Parametes	Preoperative	Postoperative	P-Value
Range of motion			
Forward elevation	136.79° ($\pm 35.37^\circ$)	171.31° ($\pm 11.95^\circ$)	<0.001
Abduction	117.74° ($\pm 39^\circ$)	166.45° ($\pm 15.47^\circ$)	<0.001
External rotation	62.14° ($\pm 18.01^\circ$)	67.86° ($\pm 15.43^\circ$)	0.055
Visual analogue scale			
Day time pain	7.38 (± 1.83)	0.92 (± 1.34)	<0.001
Night time pain	7.46 (± 2.04)	1.57 (± 1.63)	<0.001
Simple shoulder test		9.55 (± 1.9)	
UCLA score		29.33 (± 3.55)	

of postoperative stiffness, which was 11-20% when using the mini-open method.^(10, 11)

Results of all arthroscopic surgery were good to excellent, with results at 71-92%.⁽¹²⁻¹⁶⁾ This procedure has been performed in Maharaj Nakorn Chiang Mai Hospital since 2006. Our results have shown a significant improvement in daytime and nighttime pain, with comparable results to previous studies⁽¹⁷⁻²⁰⁾

Range of motion improved significantly in the direction of forward elevation and abduction, but not in external rotation. Previous reports showed varying improvement. Gartsman *et al*⁽¹⁷⁾ reported a significant improvement of motion range in all directions. Verma, *et al*⁽²⁰⁾ had similar results to our study, with external rotation not significantly improved. Lee⁽¹⁹⁾ reported better range of motion in all directions, but without any statistical significance.

The high satisfaction rate (100%) of our patients was similar to that in other studies with 90-94.3%.^(12, 17, 20) In our study, 80.95% of patients with UCLA ≥ 27 could be classified as having good to excellent results. The average score of 29.35 ± 3.55 (range 23-35) was slightly lower than the series of Gartsman⁽¹⁷⁾ and Severud.⁽⁷⁾ Gartsman *et al* had good/excellent results of 84%, with a UCLA score of 31.1 ± 3.2 . Severud *et al*, reported good to excellent results of 91% with a UCLA score of 32.6. This study evaluated the outcomes by using the UCLA score, which was originally reported in English and had not been translated or validated in the Thai language. This might have caused some inconsistencies in interpretation, but it was felt that using this score would still be the best standard. Our patients had less UCLA score in the questionnaire when asked whether they needed medication for pain relief. This was probably due to those who

took medication only for preventing pain during rehabilitation. Some of our patients had a low VAS score, but still took medication, causing no correlation between these parameters. The Simple Shoulder Tests in our patients were comparable to those in the report of Verma *et al*.⁽²⁰⁾

This study was retrospective with a limited number of patients. A prospective study with a larger series in terms of patient number and longer term follow up is underway to elucidate the benefits and outcomes of patients who undergo arthroscopic rotator cuff repair surgery.

SUMMARY

Repairing the rotator cuff tendon can be performed with the arthroscopic technique. In our hands, we had comparable results to other studies, as confirmed by the data and satisfaction of the patients. Due to its high success rate without significant complication, arthroscopic rotator cuff repair is one of the standards treatments for treating this condition.

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ผลการรักษาภาวะเส้นเอ็นหัวไหล่ฉีกโดยวิธีการผ่าตัดเย็บซ่อมผ่านกล้องใน โรงพยาบาลมหาราชนครเชียงใหม่

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จังหวัดเชียงใหม่, ³ภาควิชาออร์โธปิดิกส์ คณะแพทยศาสตร์ มหาวิทยาลัยบูรพา

บทคัดย่อ

วัตถุประสงค์ เพื่อศึกษาผลการรักษาภาวะเส้นเอ็นข้อหัวไหล่ฉีกขาดในรพ.มหาราชนครเชียงใหม่

วิธีการ ทำการศึกษาในผู้ป่วยที่ได้รับการผ่าตัดเย็บซ่อมเส้นเอ็นข้อไหล่ผ่านกล้องการศึกษา 42 รายที่มีอายุเฉลี่ย 57.2 ปีที่ได้รับการติดตามผลการผ่าตัดไปนานมากกว่า 6 เดือน โดยผู้ป่วยทั้งหมดจะได้รับการศึกษาถึงอาการปวดกลางวันและกลางคืนโดยทำการวัด Visual analogue score นอกไปจากนั้นยังได้ทำการศึกษาพิสัยการเคลื่อนไหวของข้อไหล่เปรียบเทียบกับกันทั้งก่อนและหลังการผ่าตัด การประเมินผลการรักษาจะใช้ Simple shoulder test และ การให้คะแนนข้อไหล่ของมหาวิทยาลัย UCLA ในสุดท้ายผู้ป่วยจะได้รับการสอบถามถึงความพอใจของผู้ป่วยต่อผลการรักษา

ผลการศึกษา ภายหลังจากการรักษาอาการปวดในกลางวันได้ลดลงอย่างมีนัยสำคัญจาก 7.35 ก่อนผ่าตัดเป็น 0.92 หลังผ่าตัด ในส่วนของการวัดพิสัยการเคลื่อนไหวนั้น การวัดการยกไปข้างหน้า (forward elevation) ได้เพิ่มขึ้นอย่างมีนัยสำคัญจาก 136.79° ก่อนผ่าตัดเป็น 171.31° หลังผ่าตัด การยกออกด้านข้าง (abduction) ได้เพิ่มขึ้นอย่างมีนัยสำคัญเช่นกันจาก 117.74° ก่อนผ่าตัดเป็น 166.45° หลังผ่าตัด ส่วนการประเมินผลของ UCLA score และ Simple shoulder test ที่เวลา 6 เดือนค่าเฉลี่ยอยู่ที่ 29.33 และ 9.55 ตามลำดับ หากใช้เกณฑ์การประเมินของ UCLA score ที่ว่า ≥ 27 ถือว่าให้ผลดีนั้น พบว่าร้อยละ 80.90 ของผู้ป่วยให้ผลการรักษาที่ดีถึงดีมาก และผู้ป่วยทุกราย (ร้อยละ 100) พอใจผลการรักษาที่ได้

วิจารณ์ การรักษาภาวะเส้นเอ็นข้อไหล่ฉีกขาดโดยวิธีผ่าตัดผ่านกล้องในรพ.มหาราชนครเชียงใหม่ นั้นได้ผลการรักษาเป็นที่น่าพอใจ โดยผลที่ได้สามารถเปรียบเทียบกับรายงานอื่นๆ นอกไปจากนี้ข้อได้เปรียบของการผ่าตัดด้วยวิธีนี้นั้นผู้ผ่าตัดสามารถมองเห็นพยาธิสภาพที่เกิดขึ้นในข้อไหล่ได้ชัดเจน และหากมีการหดรัดของเส้นเอ็นก็สามารถใช้วิธีนี้ในการเลาะเส้นเอ็นได้ดี ส่วนในขณะทำการผ่าตัด subacromion decompression นั้นการผ่าตัดด้วยวิธีใช้กล้องก็ทำให้มองเห็นพยาธิสภาพที่ต้องทำการตัดได้ชัดเจนกว่า และท้ายที่สุดการฟื้นตัวของผู้ป่วยหลังการผ่าตัดด้วยวิธีนี้เร็วกว่า จึงสรุปว่าวิธีการรักษาภาวะเส้นเอ็นข้อไหล่ฉีกขาดโดยการผ่าตัดผ่านกล้องเป็นหนึ่งในวิธีการมาตรฐานสำหรับการรักษาโรคนี้ เชียงใหม่เวชสาร 2554;50(4):105-114.

คำสำคัญ: เส้นเอ็นข้อไหล่ฉีกขาด การผ่าตัดส่องกล้องข้อไหล่ การผ่าตัดส่องกล้องเย็บซ่อมเส้นเอ็นข้อไหล่

Original article

Prevalence of and Factors Associated with Depression in Patients with Schizophrenia in a University Hospital: A Post-hoc Analysis

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Abstract

Objectives This study was aimed to assess the prevalence of depression and identify factors associated with depression in patients with schizophrenia in a university hospital.

Methods This was a post-hoc analysis of a cross-sectional study conducted in 75 patients with schizophrenia. Major depressive episodes were diagnosed according to DSM-IV-TR. The six social support deficits (SSDs) scale was used to identify social support deficits. Chi-square and logistic regression were used to determine factors associated with depression.

Results The prevalence of depression was 16.0%, with only 25.0% of them previously being recognized and treated with antidepressants. Age, sex, marital status, income, duration of illness, type of antipsychotic drugs and number of side effects were not significantly associated with depression. Three out of six social support deficits were associated significantly with depression, including living alone, reciprocity in the family, and dissatisfaction with family support, with odds ratios of 10.0, 4.9 and 8.6, respectively. Those with at least one social support deficit were 9.3 times more likely to be depressed than those without one ($p=0.002$).

Conclusion This study suggested that depression in patients with schizophrenia was still under recognized by Thai psychiatrists. The findings do not support the hypothesis that depression is more common in patients receiving typical antipsychotic drugs. Psychosocial factors such as social support deficits were found to have a higher impact on depression than biological ones in Thai patients with schizophrenia. **Chiang Mai Medical Journal 2011;50(4):115-122.**

Keywords: depression, schizophrenia, prevalence, antipsychotic drugs, side effect, social support

Schizophrenia is a chronic psychotic illness characterized by delusions (fixed false believes), hallucinations (perceptions without sensory stimuli), disorganized speech, and dis-

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