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## Mini open versus arthroscopic repair of rotator cuff tear: A prospective and retrospective study in rural area

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### Abstract

**Background:** Rotator cuff abnormalities (including degenerative tears and those due to injury) reportedly account for up to 70% of symptoms associated with the shoulder and have significant effects on quality of life and activities of daily living.

**Material and Method:** The objective of this study was to compare the use of resources, costs and health-related quality of life outcomes associated with arthroscopic and mini open surgical management of rotator cuff tears using follow-up of 2 years data from retrospectively and prospectively.

The study was conducted at Pravara Rural Hospital, an associate hospital of Rural Medical Collage Loni during the period of 2016 to 2018.

**Results:** There are total 125 patient's data collected by retrospectively and prospectively. Among them 60 patient underwent mini open repair and 65 patient underwent arthroscopic repair of rotator cuff tear. There were, 41 % female patient and 59 % male patient in mini open repair, 53% female and 57 % male patients in arthroscopic repair.

**Conclusion:** There is no significant difference in the functional outcome in the patient operated with mini open repair and arthroscopic repair.

There is a significant difference in patient's preference for surgery according to cost effectiveness as study conducted in rural area, so cost effectiveness is really matters for the patients coming from a poor background in rural area.

**Keywords:** Rotator cuff, arthroscopic, mini open

### Introduction

Rotator cuff abnormalities (including degenerative tears and those due to injury) reportedly account for up to 70% of symptoms associated with the shoulder and have significant effects on quality of life and activities of daily living<sup>[1, 2]</sup>.

Various forms of treatment are available for the symptomatic rotator cuff tear. Conservative management includes combinations of rest, exercise, physiotherapy, and pain relief. Surgery may also be undertaken to repair the tear using either an arthroscopic or open (including "mini-open") technique. Recent studies have shown that the number of rotator cuff procedures is increasing, in part due to a preference for minimally invasive techniques<sup>[3, 4]</sup>.

However, there are not enough research about the relative costs and health-related quality of life outcomes of arthroscopic and open procedures to help justify the choice of surgery.

Our study was carried out to investigate the clinical and cost outcomes of arthroscopic and open procedures in patients with degenerative full-thickness rotator cuff tears retrospectively and prospectively.

### Material and Method

The objective of this study was to compare the use of resources, costs and health-related quality of life outcomes associated with arthroscopic and mini open surgical management of rotator cuff tears using follow-up of 2 years data from retrospectively and prospectively.

### Inclusion criteria

The patient must satisfy all the following criteria to be eligible for the study:

- Aged over 50 years
- Suffer from a rotator cuff tear
- Have a full thickness rotator cuff tear
- Rotator cuff tear diagnosed using MRI or ultrasound scan
- Patient able to consent

**Exclusion criteria**

The patient may not enter the study if ANY of the following apply:

- Previous surgery on the affected shoulder
- Dual shoulder pathology
- Significant problems in the other shoulder
- Rheumatoid arthritis/systemic disease
- Significant osteoarthritis problems
- Significant neck problems
- Cognitive impairment or language issues
- Unable to undergo an MRI scan for any reason

The study is conducted at Pravara Rural Hospital, an associate hospital of Rural Medical Collage Loni during the period of 2016 to 2018.

The data, of operated patient of rotator cuff tear at pravara rural hospital 2 years back retrospectively and operated in may 2015 prospectively, collected with two year of follow up period.

The outcome of quality of life is measured through The American Shoulder and Elbow Surgeons Shoulder Score (ASES) after 2 years of follow-up by questionnaires.

The cost of surgery is measured by the material used for surgery (Implant, Suture Material) as ours is a charitable trust hospital so there are no operative charges, medicine charges and hospital stay charges. So comparison of cost effectiveness is done by material used for repair of rotator cuff as it is the only chargeable.

The final preference of surgery by cost effectiveness and quality of life of the patient after surgery is measured by questionnaires.

**Result**

There are total 125 patient’s data collected by retrospectively and prospectively. Among them 60 patient underwent mini open repair and 65 patient underwent arthroscopic repair of rotator cuff tear. There were, 41 % female patient and 59 % male patient in mini open repair, 53% female and 57 % male patients in arthroscopic repair. (Table. 1)

**Table 1:** Gender Wise Distribution

	Mini Open Group	Arthroscopic Group
Male	35	33
Female	25	32
Total	60	65

The average age of the patient for rotator cuff tear is 58 year. (Table.2)

**Table 2:** Mean Age of the Patient in Year

	Mini Open Group	Arthroscopic Group
Male	58	57
Female	57	58

All patients showed improvement in their modified ASES scores with surgery.

The initial modified ASES score for patients in the arthroscopic group averaged 50, and this improved to an average final score of 89 (P \_ .05).

For patients in the mini-open group, the initial score averaged 43, improving to an average final score of 88 (P \_ .05).

The preoperative and postoperative modified ASES scores were not significantly different between groups (P \_ .252 and P \_ .333, respectively).

In addition, the individual scores for pain, satisfaction, and function showed significant improvement for both groups. (Table. 3)

**Table 3:** Preoperative and Postoperative Modified ASES Scores (range) for Each Group

	Mini Open Group		Arthroscopic group	
	Pre Operative	Post Operative	Pre Operative	Post operative
Pain (30 Points)	13 ( 1-22)	27 (19 -30)	15 (5 -25)	26 (18 - 30)
Satisfaction (10 Points)	3 (0-10)	9 (5-10)	2 (0 - 10)	9 (5 - 10)
Function (60 points)	27 (10 - 44)	52 (25 - 60)	33 (14 - 44)	54 (25 - 60)
Total (100 points)	43 (9 -48)	88 (50- 100)	50 (10 - 52)	89 (50 - 100)

There are 70% in patients in the study who prefers mini open repair by the cost effectiveness as majority of the patients are from poor background.

**Discussion**

Although arthroscopic rotator cuff repair is a relatively new technique, several investigators have published reports of their short-term results for arthroscopic repair of full-thickness rotator cuff tears [5-15].

Mini-open repair represented an attempt to combine the best features of arthroscopic and open repair. The ability to address intra-articular pathology and still repair the tendon with bone tunnels without taking down the deltoid origin has made mini open repair a popular technique. Short-term results of mini-open repair have been encouraging [16-18].

Gartsman *et al.* reported on a series of 73 patients who had undergone arthroscopic rotator cuff repair and were followed-up for a minimum of 2 years. Patients improved their ASES

scores from an average of 30.7 to 87.6. Based on Constant and Murley scores, 84% of patients had either a good or excellent result [6].

These results were similar to the results obtained with either open or mini-open repair and have provided a basis for the continued use of this technique [17, 19-23].

Servud and his colleagues compared 35 patients who had undergone mini-open repair with 29 patients with arthroscopic repair. At final follow-up, which averaged 44.6 months, there was no significant difference in function or range of motion. However, they reported that 4 of the 29 patients developed stiffness. Final outcome as measured by the ASES, UCLA, and SST scores were similar [10].

**Conclusion**

There is no significant difference in the functional outcome in the patient operated with mini open repair and arthroscopic repair.

There is a significant difference in patient's preference for surgery according to cost effectiveness as study conducted in rural area, so cost effectiveness is really matters for the patients coming from a poor background in rural area.

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