

# Strength of External Rotator on Functional Activities in Patients with PA Shoulder

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## ABSTRACT

**Background:** Periarthritis shoulder is an inflammatory condition that causes fibrosis of the glenohumeral joint capsule is accompanied by gradually progressive stiffness and significant restriction of range of motion typically external rotation.<sup>[1]</sup>

20 people with PA shoulder of age group >30 years were recruited from the community. The strength of external rotators on functional activities in patients with PA shoulder was evaluated by MMT, ROM, and SPADI.

**Method:** 20 people with PA shoulder of age group >30 years were recruited from the community. The strength of external rotators on functional activities in patients with PA shoulder was evaluated by MMT, ROM, and SPADI.

**Result:** Correlation between ROM and MMT shows  $r=0.561$ . A significant positive correlation is found between ROM and MMT ( $p$  value  $<0.05$ ) which indicates that's the variable move in same direction.

**Conclusion:** Increment in MMT shows significant improvement on ROM.

Also this study shows a significant negative correlation between ROM and SPADI, which indicates increment in SPADI cause a significant decrement in ROM.

Therefore this study concludes overall significance in external rotators of shoulder in functional activities of patients with PA shoulder.

**Keywords:** PA shoulder, Periarthritis shoulder, external rotators of shoulder

## INTRODUCTION

Periarthritis shoulder or Frozen Shoulder Syndrome, clinically known as adhesive capsulitis, is a painful and debilitating condition affecting up to 5% of the population. Adhesive capsulitis is considered fibrosis of the glenohumeral joint capsule with a chronic inflammatory response. Patients experience pain, limited range of motion, and disability generally lasting anywhere from 1 to 24 months.<sup>[2]</sup>

Adhesive capsulitis is characterized by pain, stiffness, and limited function of the glenohumeral joint, which adversely affects the entire upper extremity. Patients typically describe onset of shoulder pain

followed by a loss of motion. The most common limitations in range of motion are flexion, abduction, and external rotation.<sup>[2, 3]</sup>

As muscle power plays a major role in preventing the decreasing range of motion in PA shoulder in these patients its observed that there is decrease in muscle power in especially the external rotators with the help of assessing tool as Manual muscle testing(MMT) and Shoulder pain and disability index(SPADI) score.<sup>[4]</sup>

We accordingly designed the present study to assess the effect of external rotators strength on functional activity in patients with PA shoulder.<sup>[5]</sup>

## METHODOLOGY

### Methodology:

- **Study Design:**

Experimental study.

- **Study Setting:**

Subjects were taken from the Bangalore city.

- **Sampling Technique:**

Purposive sampling technique was used for PA shoulder patients.

- **Sampling Population:**

20 radiological confirmed PA shoulder patients were taken.

- **Sample Size:**

20 patients.

### Criteria for selection:

#### *Inclusion criteria:*

1. Age 35 - 60 years
2. Scratch test - positive for PA shoulder
3. Shoulder pain at least for one month associated with more than one third loss of active shoulder flexion, abduction and external rotation
4. Normal antero-posterior radiograph of glenohumeral joint

#### *Exclusion criteria:*

1. Patients with cervical, neurological, dermatological, vascular, neuromuscular, cardiac, renal pathology
2. History of trauma/surgery
3. Clinical evidence of complex regional pain syndrome
4. Patients with chronic diseases and pregnancy

### Materials used in the study

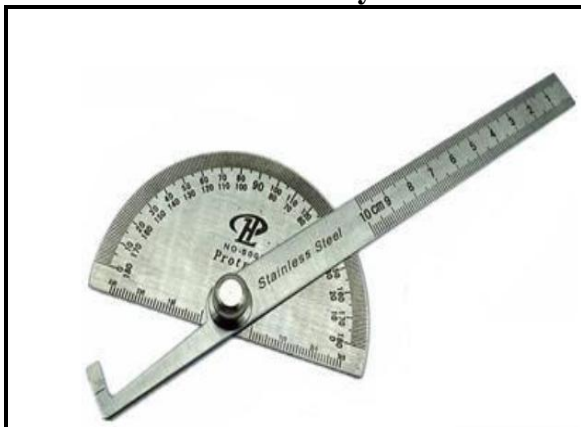


Figure: 1(a)



Figure: 1 (b)



Figure: 1 (c)



Figure: 1(d)



Figure: 1 (d)



Figure: 1(e)

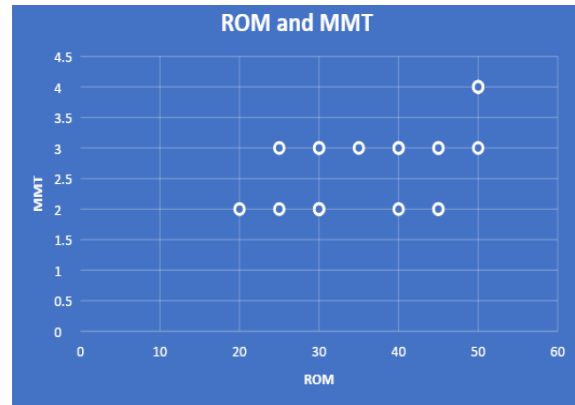


Figure: 2(a)

## METHOD

### • Preparation

Ensure the bed lighting  
ROM OF EXTERNAL ROTATORS

### • Participation

#### Testing position

Patient is supine with the shoulder abducted to 90 degrees and the length of the humerus on the test side is supported on the plinth.

Forearm is in neutral position.

#### Goniometer Placement

AXIS LOCATIONS - olecranon process of ulnar STATIONARY ARM – perpendicular to the floor (vertical) in line with the ulnar side of the forearm from the axis point to the ulnar styloid process.

### • Expected Findings

Expected range of motion for external rotators is 0°– 90°

## RESULTS

Results were interpreted that there is overall significant muscle weakness

The 20 units under study shows an average MMT of 2.75 with SD 0.716 and average SPADI score is 64.03 with SD 12.70. The average ROM is 37.75 with SD 9.66.

Table showing mean, SD of MMT, SPADI, ROM

	Mean	Std. Deviation
MMT	2.7500	.71635
SPADI	64.0330	12.70195
ROM	37.7500	9.66205

Table showing correlation

ROM	MMT	SPADI
.r value	0.561	-0.492
P value	0.010	0.028

Correlation between ROM and MMT showed  $r=0.561$ . A significant positive correlation is found between ROM and MMT ( $p$  value  $<0.05$ ) which indicates that variable move in same direction. Increment in MMT shows significant improvement on ROM.

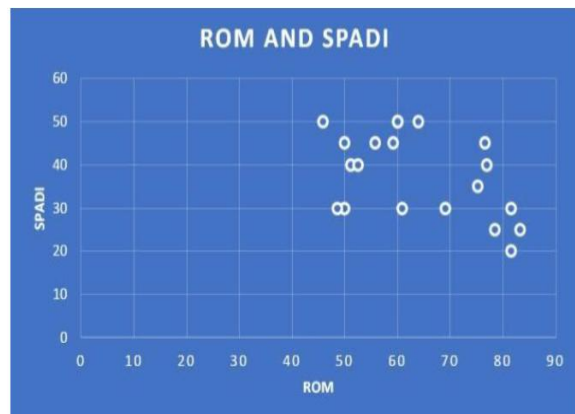


Figure: 2(b)

The correlation between ROM and MMT shows ( $r=0.56$ ). A significant positive correlation found between ROM and MMT ( $p$  value  $<0.5$ ) which indicates the value that's the increment in MMT shows improvement in ROM. The table also shows a significant negative correlation between ROM and SPADI that indicates increment in SPADI causes significant decrement in ROM; therefore this study concludes overall significance of external rotator weakness that affects the functional activities of patients with PA shoulder.

## DISCUSSION

In PA shoulder the decreased ROM especially the external rotation will result in further more weakness in external rotators.

The main objectives of this study were to assess the weakness of external rotators and its effects on functional activities in patients with PA shoulder<sup>[1,2,3]</sup>. Our current findings showed the mean MMT of the subjects with PA shoulder was 2.7, SPADI score mean value 64.03 and range of motion mean value 37.5 was reported in this study for subjects with PA shoulder. PA shoulder usually afflicts population above 35 years. Our current findings showed that the correlation between ROM and MMT p value <0.5 also showed significant negative correlation between ROM and SPADI p value <0.5. Hence, this study concluded that loss of ROM and reduction in MMT of external rotators increase the SPADI score that results in functional activity limitation in patients with PA shoulder due to weak external rotators, so the strength assessment of external rotators should be considered in clinical practice and may assess with directing targeted management strategy<sup>[7]</sup>. People with PA shoulder taken 20 showed significant external rotator weakness. In summary this study showed the correlation between the effect of muscle weakness and functional activity in patients with PA shoulder

## CONCLUSION

- Our study concluded that significant strength deficit in external rotators exists in patients with PA shoulder, so external rotators strength assessment should be considered in clinical practice.
- Manual muscle testing can be considered for strength assessment of external rotators in PA shoulder along with ROM.
- Strengthening of external rotators in PA shoulder rehabilitation can be considered in the clinical practice as strengthening of muscles increases the muscle power which in turn increases the ROM and increases the ability of functional activities in patients with PA shoulder.<sup>[5, 6]</sup>

## Limitations of the Study

Small sample size was taken for study i.e. 20

As maneuvers are to be performed by the subject, the result greatly depends on confidence level and skill of subjects.

Excessive repetitions if performed by the subject can lead to exertion which affects the results.

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