

Case Report:

Effectiveness of Gong's Mobilization on shoulder abduction in adhesive capsulitis: A Case Study

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Abstract:

We reported a case of 50 year old male patient accountant by occupation with right hand dominance came with complaints of pain around right shoulder with difficulty in overhead activity since five months. He first approached to the orthopedic OPD five months back where he was diagnosed as a case of adhesive capsulitis. He was on medication since last five months (NSAIDS, and Muscle relaxants) initially the pain was severe and patient also had sleep disturbances due to pain, and was not able to carry out self care activities (Hair combing, dressing etc.) with right shoulder. Then patient was referred to physiotherapy department for further management, where patient was thoroughly examined. A single case study design was used to achieve the objectives of this project. The present study was designed to determine the use of Gong's Mobilization on shoulder abduction range of motion in adhesive capsulitis over two week period thus reducing the pain and improve normal abduction range of motion. From present study we may conclude that Gong's Mobilization is useful in improving shoulder abduction range of motion in a patient of adhesive capsulitis.

Keywords : Gong's Mobilization , glenohumeral joint

Introduction

The glenohumeral joint is a ball and socket variety of a synovial joint with three rotational and three translational degrees of freedom. Flexion and extension occur around coronal axis, abduction/adduction occurs around an A-P axis passing through the humeral head center whereas medial and lateral rotation occur about a long axis parallel to shaft of humerus and passing through centre of the humeral head. The articulation is composed of the large head of humerus and smaller glenoid fossa. Anatomically the humeral head is placed slightly

medially, posteriorly and superiorly, and the glenohumeral joint capsule is twisted forward and medially. The range of abduction of the humerus in the frontal plane (whether done actively or passively) will be diminished if the humerus is maintained in neutral or medial rotation because of impingement of greater tubercle on the coracoacromial arch¹.

In order to achieve normal abduction through elevation the humerus must rotate 35-40° laterally. If the humerus rotates laterally it reduces the risk of impingement. However in pathological condition like adhesive capsulitis where there is presence of

capsular pattern of glenohumeral joint, in such a condition it is not possible to achieve full abduction through elevation because of marked limitation of external rotation². Adhesive capsulitis a term coined by Codman in 1934 is an orthopaedic condition that is commonly encountered in general practice³. It is characterized by an insidious and progressive loss of active and passive mobility in the glenohumeral joint presumably due to capsular Contracture.

Various orthopedic manual therapy approaches are considered for the management of adhesive capsulitis. Yang et al. (2007) reported that after they applied end-range mobilization (ERM), mid-range mobilization (MRM), and mobilization with movement (MWM) to frozen shoulder patients for 12 weeks; the ROMs of ERM and MWM increased more than MRM, and the scapulohumeral rhythm improved after 3 weeks of MWM⁴. Teys et al. (2008) measured the shoulder ROM after applying Mulligan's mobilization with movement (MWM) technique once to patients with painful shoulder conditions and found that it increased by 15.3%⁵. Guler-Uysal and Kozanoglu (2004) reported that they applied the Cyriax approach of deep friction massage and mobilization exercises, three times a week, to patients with adhesive capsulitis, and their ROM increased after two weeks⁶.

But the Mulligan's concept has disadvantage in which it requires the external rotation of humerus to restore normal abduction through elevation. Recently one study carried out by Wontae Gong et.al on Korean population reported that the disadvantages of Mulligan's concept can be minimized by Gong's mobilization. Wontae Gong is a professor at department of physical therapy, Gumi College from republic of Korea. The result of their study showed that the shoulder abduction range of motion can be

improved by mobilizing the shoulder with internal rotation⁷.

However there is lack of evidence of effectiveness of this mobilizing technique in adhesive capsulitis. Hence this study aims to investigate the effectiveness of this mobilizing technique in adhesive capsulitis.

Case report

We reported a case of 50 year old male patient accountant by occupation with right hand dominance came with complaints of pain around right shoulder with difficulty in overhead activity since five months. He first approached to the orthopedic OPD five months back where he was diagnosed as a case of adhesive capsulitis. He was on medication since last five months (NSAIDS, and Muscle relaxants) initially the pain was severe and patient also had sleep disturbances due to pain, and was not able to carry out self care activities (Hair combing, dressing etc.) with right shoulder. Then patient was referred to physiotherapy department for further management, where patient was thoroughly examined.

Examination

Patient was thoroughly assessed by therapist: Patient's pain and functions were assessed with help of shoulder pain and disability index scale (SPADI). The shoulder pain and disability index has a two dimensions, first dimension consists of five questions regarding the severity of pain, and second dimension consists of eight questions which were designed to measure degree of difficulty with activities of daily living.

Range of motion:

The range of motion was assessed with the help of Universal Goniometer using standardized protocol and it was found that the range motion (active and passive) was significantly less than normal and followed a capsular pattern. The external rotation was

20° actively and 25° passively (normal 90), abduction 70° actively and 75° passively (normal 180), and flexion 100° actively and 110° passively (normal 180), internal rotation 65° actively and 70° passively (normal 80), extension 45° actively and 50° passively (normal 60) and adduction 25° actively and 35° passively (normal 45).

Manual Muscle Testing:

The strength of the muscles (group) of right and left shoulder was assessed with patient in supine lying for flexors, adductors and rotators, and for abductors patient was positioned in sitting and for extensors in prone lying. The muscle strength was measured within the available range using the oxford scale.

Resisted Isometric Contractions (RIC):

For assessment of flexors and rotators patient was positioned in supine lying, and was asked to perform the respected movement against the therapist's resistance. For assessment of abductors patient was in sitting position and for extensors in prone lying position.

The RIC for abductors, external rotators and flexors were strong and painful where as for extensors, adductors and internal rotators were strong and painless.

Passive accessory movements:

The movements were assessed with Kalternborn's scale by applying inferior, anterior and posterior glides and lateral glide and the result of this examination showed that posterior, inferior and lateral glides were slightly hypo mobile (Grade-2) and was painless whereas for anterior glide it was normal (Grade-3) and painless.

Outcome measures:

Before and after interventions the following outcome measures were noted.

1. Range of Motion on Universal Goniometer.
2. Pain and functions on SPADI⁸.

Treatment

Research design

A single case study design was used to achieve the objectives of this project. A-B-A design which was already described for single case study was modified as A-B-C design for this study⁹. This approach has been used previously to study the effectiveness of manipulative physiotherapy in the treatment of cervicogenic headache and tennis elbow¹⁰.

Protocol

The study was divided into three phases

Phase (A): pre treatment assessment: baseline outcome measures: Range of Motion with Universal Goniometer and pain and functions were measured on SPADI scale, on the first day. Treatment was not given during this phase (A).

Phase (B): Intervention period: The intervention was given for two weeks in morning session. For Gongs Mobilization the participant sits on a stool with no backrest, keeping spine straight and arm extended at the side. The therapist stands on non-affected side and places one hand on the head of humerus and the other on the scapula, the therapist then applies an anterior to posterior glide to head of humerus and posterior to anterior glide to scapula. With the sustained glide the participant is asked to perform abduction with glenohumeral joint medially rotated and elbow flexed to 90° in coronal plane. Two sets of 15 repetitions were given with five minutes of rest period between the sets.

Phase (C): Post-treatment: Home exercise programme. In the final phase, Home exercises in the form of active assisted, Codman's pendular, and finger ladder exercises was given to patient.

Results

CATEGORY	ROM												SPADI /130
	Flex.		Ext.		Abd.		Add.		I.R.		E.R.		
	AR	PR	AR	PR	AR	PR	AR	PR	AR	PR	AR	PR	
Pre -intervention	100°	110°	45°	50°	70°	75°	20°	35°	65°	70°	20°	25°	64.61%
Post -intervention	110°	115°	55°	60°	130°	140°	35°	45°	75°	80°	40°	45°	30%

Table-1: Pre and post intervention range of motion and shoulder pain and disability index score.

*ROM= range of motion

*SPADI= shoulder pain and disability index

*Flex. = Flexion

*Ext. = Extension

*Abd. = Abduction

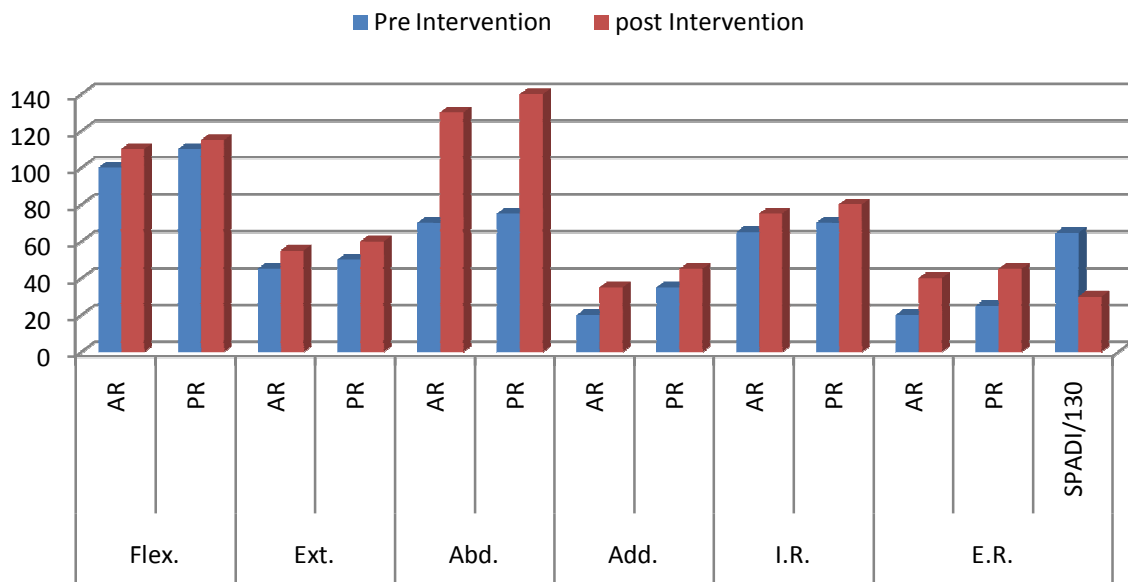
*Add. = Adduction

*I.R. = internal rotation

*E.R. = External rotation

*AR= Active range

*PR= passive range



Graph 1: Pre and post intervention range of motion and shoulder pain and disability index score.

The shoulder abduction range of motion and the level of pain and disability taken before and after the intervention over a two week period and the values obtained after two weeks showed that there was significant improvement in shoulder abduction range of motion.

Discussion

The present study was designed to determine the use of Gong's Mobilization on shoulder abduction range of motion in adhesive capsulitis over two week period thus reducing the pain and improve normal abduction range of motion.

In this study the increase in shoulder abduction range of motion occurred because with Gong's Mobilization, the abduction of the shoulder joint occurs when the humeral head was in normal position and the normal muscular contraction occurs with the rolling and sliding occurring at the articular surface when the tension of posterior joint capsule is reduced.

The main advantage of Gong's Mobilization is that it can be done in sitting position, and it provides immediate effect and it does not require external

rotation to improve abduction which can be helpful in a adhesive capsulitis patients where marked limitation of external rotation is present but this advantages need to be confirmed in future studies with larger sample size. Hence Gong's Mobilization can be considered as a useful manual therapy tool in the management of adhesive capsulitis. The values obtained after the interventions showed improvement in the range of other movements that might be the result of home exercises which was given to the patient. The reduction in the intensity of pain is the result of stimulation of mechanoreceptor located within the joint. The combined effect of reduction in the intensity of pain and improvement in the range of motion led to overall increase in functional activity which was proved by reduction in the score of SPADI.

Conclusion

Gong's Mobilization is useful in improving shoulder abduction range of motion in a patient of adhesive capsulitis.

PHOTOGRAPHS:



1: Pre-intervention shoulder abduction range of motion.



2: Post- intervention shoulder abduction range of motion.

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