Effects of Gong’s Mobilization Applied to Shoulder Joint on Shoulder Abduction

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Abstract. [Purpose] The purpose of this study was to verify the effects of Gong’s Mobilization on shoulder abduction range of motion (ROM). [Subjects] In this study, 57 male and female adults whose shoulder abduction ROM was limited to 120 degree or less were selected and separated into a Gong’s Mobilization group (n=28) and anterior to posterior gliding group (n=29). [Methods] Gong’s Mobilization and an anterior to posterior gliding were repeated 10-15 times. A goniometer was used to measure the shoulder abduction ROM. [Results] Both Gong’s Mobilization and anterior to posterior gliding were effective in increasing shoulder abduction ROM, but the effect of Gong’s Mobilization was greater. [Conclusion] Gong’s Mobilization is a useful treatment alternative in the clinical setting because it has an immediate effect and it can be done in the sitting position.

Key words: Gong’s Mobilization, Anterior to posterior gliding, Shoulder abduction ROM

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INTRODUCTION

Joint mobilization is a manual therapy that applies passive traction and gliding motion to the articular surface to maintain free mobility of joints or to restore the normal condition of joints. Joint mobilization can be effectively used for pain reduction and improvement of joint mobility1,2).

During shoulder abduction, the rolling and sliding of the humeral head must occur harmoniously. However, normal rolling and sliding is difficult because the humeral head is often medially rotated and dragged forward due to excessive tension of the pectoralis major and the subscapularis muscles: the part between the glenoid cavity and the humeral head changes from the normal position to an abnormal position because the tension of the posterior joint capsule increases3). In such cases, anterior to posterior gliding is applied for joint mobilization with the patient in the supine position4). However, even though anterior to posterior gliding puts the humeral head in the normal position when the patient is static in a supine position, it cannot maintain the normal position of the humeral head during dynamic motion by the patient, such as shoulder abduction. This study was performed to verify the effect of Gong’s Mobilization on shoulder abduction ROM as Gong’s Mobilization, which effects shoulder abduction while the humeral head is in the normal position to the glenoid cavity of the scapula.

SUBJECTS AND METHODS

Out of 150 normal college students, 57 male and female students, whose shoulder abduction ROM was limited to 120° or less, were selected and randomly assigned to the Gong’s Mobilization group (treatment group: 12 males and 16 females; 10 right and 18 left shoulders) or the anterior to posterior gliding group (control group: 13 males and 16 females; 10 right and 18 left shoulders). The shoulder abduction ROM of the subjects was limited to 120° or less probably because of their busy college life. Even though they were normal college students without problems in musculo-skeletal and nervous systems that might limit the shoulder abduction ROM, it was limited because the measurement was performed maintaining the shoulder medial rotation strictly in terms of anatomical position. Those who had problems in the musculo-skeletal and nervous systems, who felt pain during shoulder abduction, and who had limited ROM due to burns or postoperative scars were excluded. We thoroughly explained the purpose of this study and the details of the experiment to the subjects and received their voluntary consent to participation.

The mean age, height and weight of the treatment group were 22.0±3.8 years, 166.0±9.9 cm, and 60.2±11.5 kg; those of the control group were 21.6±3.1 years, 165.6±7.5 cm, and 57.3±9.9 kg. Between groups, gender was tested with the chi-squared test, and age, height and weight were tested with the independent t-test. As there were no
statistically significant differences found in these tests (p>0.05), the homogeneity of the two groups was established. Both shoulders of each subject were measured and the shoulder with the least shoulder abduction ROM was measured and mobilized. For measurement of the shoulder abduction ROM, the subjects performed shoulder abduction in a standing position on a wide, flat wall with the elbow joint extended while lateral flexion of the trunk was restricted and the ulnar side of the forearm and fifth finger remained in contact with the wall. The ROM was measured with a goniometer (USA).

For Gong’s Mobilization, the subjects sat on knee-high chairs with no back with the spine in a neutral position and comfortably extended both their arms. A physical therapist stood on the side opposite to the affected side. The therapist pushed the scapula of the affected side in a posterior to anterior direction with one hand, and pushed the humeral head in an anterior to posterior direction parallel to the joint plane with the other hand. This restored the humeral head, which had been pushed forward, to its normal position. Simultaneously, the subject was asked to quickly and powerfully perform shoulder abduction with no external rotation, with elbow flexion in the coronal plane, and with the palm facing the inside and the back of the hand facing the outside. During this time, the hands of the therapist kept pressing the humeral head with the long axis of the palm aligned with the long axis of the humerus. The therapist followed the subjects when they were performing shoulder abduction, at the same speed while maintaining a little distraction, and adding acceleration in the end range. Otherwise, no increase of ROM would occur because the pressure on the humeral head would be loosened during shoulder abduction and the humeral head would return to its original abnormal position. Gong’s Mobilization was repeated for 10–15 times.

For the anterior to posterior gliding, subjects lay down in a supine position on the treatment bed with the scapula bone on the couch and the humeral head pointing out of the couch, in the resting position, while a therapist stood between the trunk and arm of the patient. The therapist held the elbow joint and forearm of the subject. The therapist fixed the subject’s limb below the axilla while maintaining mild distraction of the shoulder joint with one hand and softly pressed the humeral head of the subject from anterior to posterior with the other hand using his or her weight. The pressing was repeated to the front and rear at Maitland’s mobilization grade III-IV and maintained for about 7 seconds at grade IV. This cycle was repeated for 10–15 times5,6). Gong’s Mobilization and anterior to posterior gliding were performed by therapists who had more than 10 years of clinical experience.

The experimental results were statistically analyzed using SPSS 12.0 KO (SPSS, Chicago, IL, USA). After the general characteristics of the subjects were determined, the paired t-test was used to compare the changes in shoulder abduction ROM pre- and post-intervention within each group. The differences between the 2 groups were tested using the independent t-test. The statistical significance level, α, was chosen as 0.05.

### RESULTS

The shoulder abduction ROMs of the Gong’s Mobilization group and the anterior to posterior gliding group before and after the intervention were compared and the differences were statistically significant for both groups (Table 1). The independent t-test for the shoulder abduction ROMs of the two groups before and after the intervention, and for the differences between the values before and after the intervention, showed that the values before intervention were not statistically significant. However, the values after the experiment and the differences between the values before and after the experiment were statistically significant (Table 2).

### DISCUSSION

Many studies have been conducted of treatments for improving shoulder abduction ROM. 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%7). Souza et al. (2008) reported that they applied Maitland joint mobilization grades III and IV on 25 persons and their ankle dorsiflexion ROM increased immediately after joint mobilization8), which showed the immediate positive effect of manual therapy.

Guler-Uysal and Kozanoglu (2004) reported that they applied the Cyrix approach of deep friction massage and mobilization exercises, three times a week, to patients with adhesive capsulitis, and their ROM increased after two weeks9). Loew et al. (2005) reported that after they applied manipulation to frozen shoulder patients under general anesthesia; patients’ ROM increased but intra-articular lesions were generated10). 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 MWM.\(^4\)

In this study, Gong’s Mobilization and anterior to posterior gliding were applied to the shoulder joint and the immediate effects of Gong’s Mobilization and general joint mobilization were compared. It was found that both Gong’s Mobilization and anterior to posterior gliding were effective at increasing the shoulder abduction ROM, but Gong’s Mobilization was more effective.

The increase of shoulder abduction ROM after application of Gong’s Mobilization, in one session was a result similar to those reported in previous studies.\(^5,6\) The fact that the ROM increased more by Gong’s Mobilization than by anterior to posterior gliding appears to be because mobilization occurs in the end range in anterior to posterior gliding but tension of the posterior joint capsule is reduced in the static position. With Gong’s Mobilization, on the other hand, the abduction of the shoulder joint occurs when the humeral head is in the normal position; thus, normal muscular contraction occurs with the rolling and sliding occurring at the articular surface when the tension of posterior joint capsule is reduced.

In conclusion, we hope that Gong’s Mobilization will be used more widely in clinical settings because it has an immediate effect. It is more effective than anterior to posterior gliding and can be done in a sitting position. We recommend that a comparative study of Gong’s Mobilization, exercise therapy, and the MWM technique is performed in the future.

**REFERENCES**