

The Impact of Mobilization with Movement (MWMs) on Chronic Shoulder Immobility Associated with Functional Deficits: A Case Report

James Achatz II, MPT

Purpose...

- The purpose of this case report is to demonstrate the effectiveness of Mobilizations with Movement (MWMs) to the shoulder girdle in a single case with chronic immobility secondary to traumatic dislocation.

Objectives

- To increase one's knowledge concerning shoulder instability.
- To reveal the value of the DASH outcome measure tool.
- To describe the effectiveness of MWMs to the shoulder girdle in an individual with chronic immobility.
- To add to the current body of knowledge concerning MWMs.

Shoulder Instability

- Due to the amount of mobility of the shoulder complex it is the most common joint to demonstrate instability¹ (Oatis 2004).
- Acquired instability: Traumatic 96%, Atraumatic 4% ² (Carr 1996).
- Most common direction of instability is anterior, followed by posterior and lastly inferior dislocations.
- Pathologies resulting in instability are due to motions or forces that overwhelm the constraints of stability¹ (Oatis 2004).

The Case

- **Primary Diagnosis:** Anterior/Inferior Glenohumeral Dislocation confirmed by emergency room radiographs.
- **Secondary Diagnosis:** Rotator Cuff Tear, Subacromial Impingement
- **Age:** 72 years old
- **Gender:** Female
- **Hand Dominance:** Right
- **PMH:** Hypertension
- **Current Medication:** Patient denied any use of prescription of over the counter medications
- **Subjective Complaints:** Pain 5-6/10 on Visual Analog Scale, decreased right shoulder ROM, decreased functional ability of right upper extremity; such as driving, dressing herself, and lifting/reaching for overhead objects due to pain and weakness located in the right shoulder complex. The patient also complained of sleep interruption secondary to pain.

- **Mechanism of Injury:** Fall on Outstretched Arm; three attempted reductions before successful reduction in emergency room.
- **Patient's Goals for Physical Therapy;** included driving independently using her right UE and returning to other functional activities such as dressing herself independently.
- **Special Test:** Positive Apprehension as described by Magee³
- **Palpation;** revealed increased tenderness at the anterior and posterior joint line of the humerus in the glenoid fossa, the supraspinatus tendon insertion, and the long head of the biceps tendon.
- **ROM limitations**

Objective Measurements

Shoulder ROM	Passive ROM	Active ROM
Flexion	75	89
Abduction	60	85

In Summary...

- Preferred Practice Pattern Musculoskeletal D *Impaired Joint Mobility, Motor Function, Muscle Performance, and Range of Motion Associated with Connective Tissue Dysfunction.*
- Traumatically dislocated shoulder that was placed in a immobilizing sling for 3 weeks with AROM restrictions.
- Presented with decreased ROM and joint mobility in inferior and posterior directions.
- Pain in right shoulder 5-6/10 on VAS.

Goals for the patient

- Decrease pain to 0/10 subjectively.
- Improve right shoulder PROM to within normal limits.
- Improve right shoulder AROM to within functional limits.
- Improve right shoulder strength to 4/5 in all muscle groups.
- Return to previous functional levels; Independent in all ADL's.

Initial Treatment Interventions Treatment numbers 1-10.

- PROM all planes. AAROM all planes.
- Grade II-III Joint mobilizations; inferior and posterior directions (Kaltenborn principle)
- Functional massage to the posterior rotator cuff musculature; teres minor, teres major and subscapularis.
- Progressive resistive exercises in available AROM
- Moist heat to right shoulder

MWM Introduced; Treatment 11.

- Re-examination of patient.
- Patient completed DASH questionnaire; Subjective outcome measure related to functional tasks
- MWM to shoulder girdle for elevation in the plane of the scapula, with long axis traction.

DISABILITIES OF THE ARM, SHOULDER AND HAND

THE DASH

INSTRUCTIONS

The questionnaire asks about your symptoms as well as your ability to perform certain activities.

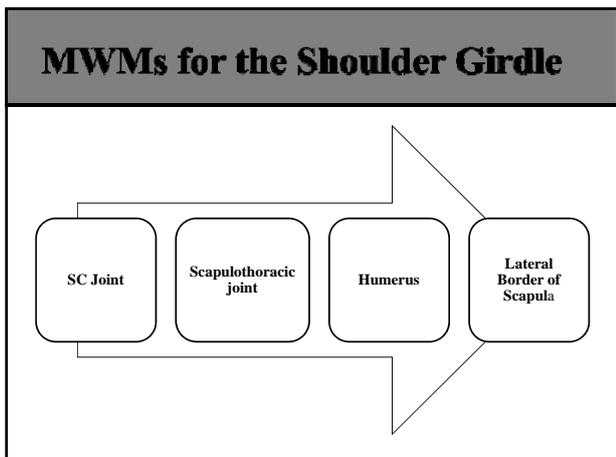
Please answer every question, based on your condition in the last week, by circling the appropriate number.

If you did not have the opportunity to perform an activity in the past week, please make your best estimate on which response would be the most accurate.

It doesn't matter which hand or arm you use to perform the activity; please answer based on your ability regardless of how you perform the task.



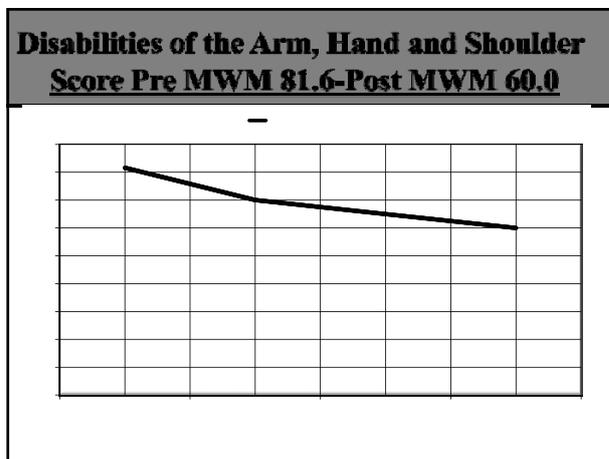
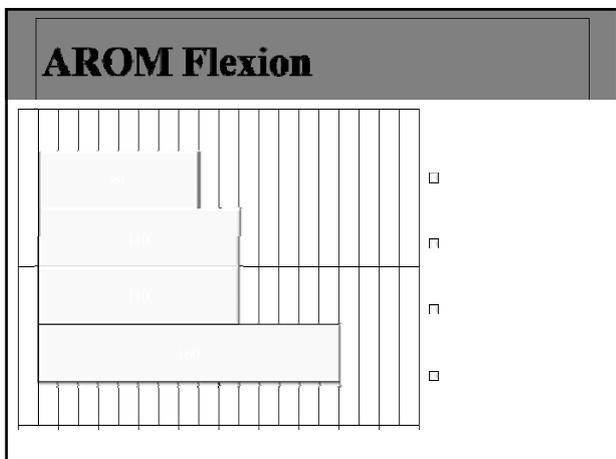
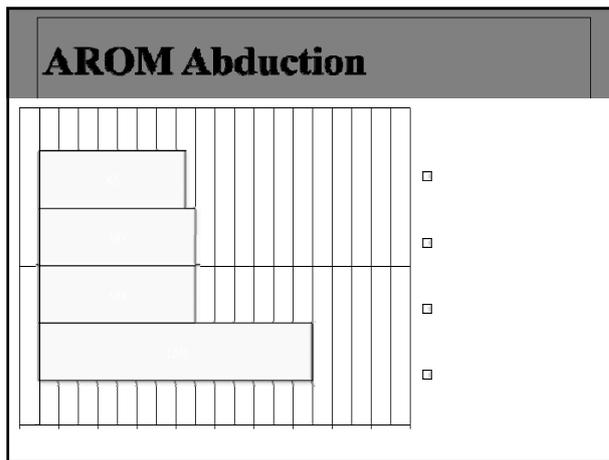
- DASH has been proven to be reliable and valid for proximal and distal disorders of the upper extremity⁵ (Beaton D. Kacz J. 2001)
- DASH chosen for ease of patient use.
- Initial DASH score: 81.6



The Technique...

- The patient was seated. The two person technique was utilized.
- The points of contact were; the lateral aspect of the spine of the scapula, medial clavicle, lateral border of scapula, and humerus.
- Traction through the humerus was utilized as well as elevation in the plane of the scapula.
- 6 Repetitions were implemented.
- Technique was pain free.

- The MWMs intervention was able to provide increased AROM to the right shoulder. The change in treatment resulted in an immediate increase of 60 degrees of abduction and 50 degrees of flexion.
- Subjective complaints of pain 1-2/10 on VAS.
- The patient was given a simple home program to reinforce ROM over the course of two days.
- She returned to physical therapy 2 days later maintaining the majority of her ROM gains.



- The ROM gains and the improvements in the DASH outcome measure illustrate the effectiveness of this technique.

Discussion...

- The positional fault that Mulligan describes is multifaceted; described as following a regular pattern of shoulder girdle elevation (the scapula is raised), internal rotation of the scapula (the inferior angle moves laterally), the scapula translates laterally, and the scapula appears to wing.
- These findings correlate with studies by Matias and Pascoal⁷ (Matias R, Pascoal AG 2006) that reveal scapular positional patterns that cause instability.

Matias and Pascoal⁷

- The results of the study revealed that “subjects with shoulder instability changes on scapulothoracic motion are restricted to protraction and spinal tilt rotations...”
- The study suggests that at a particular angle of arm elevation, changes in the scapular protraction and/or spinal tilt rotation could introduce changes on the alignment of the humeral head and the glenoid, predisposing the shoulder to instability.

- It is further suggested that these changes in scapular rhythm could be correlated to muscle imbalances, correlating with other theories proposed by Carr² (Carr AJ 1996) and Paine and Voight⁸ (Paine RM, Voight M 1993). These studies confirm that the relationship between the glenoid fossa and the humerus is crucial in maintaining a stable and yet mobile joint.

- Lippit and Masten⁹ (Lippitt S, Matsen F 1993) associate concavity depression, of the glenoid, and scapulothoracic-humeral balance with stabilizing factors throughout the ROM.
- They proposed that “as long as the scapula is positioned so that the glenoid fossa encloses, the net forces acting on the humeral head, the glenoid, the humeral joint will remain stable⁹.” In turn increasing ROM in pain free ranges.

In Conclusion...

Although the exact understanding of the MWMs is yet to be determined it is evident that the relationship between the glenoid fossa and the humerus is critical to active elevation. The pathology of traumatic dislocation further supports the theory of positional faults and the disruption of the proper force couple at the shoulder.

Limitations

- Limited due to the nature of a case study.
- The lack of special tests and a postural examination during the initial examination of the patient.
- The lack of follow up with the patient, as she was discharged from physical therapy from the referring orthopedic surgeon after the ROM gains were achieved.

Recommendations for Future Research

- Randomized controlled studies are required to more adequately understand the mechanism of position faults and correction related to the rapid ROM gains.
- Future research on the biomechanical mechanisms of the shoulder girdle in relation to MWMs is needed to understand how positional faults occur and are corrected with MWMs.
- Development of a physical examination protocol to measure positional faults of the shoulder.

References

1. Oatis CA. *Kinesiology: The mechanics & Pathomechanics of human movement*. Philadelphia, Pennsylvania: Lippincott Williams & Wilkins; 2004.
2. Carr AJ. Biomechanics of shoulder stability. *Current Orthopaedics*. 1996; 10: 146-150.
3. Magee DJ. *Orthopedic Physical Assessment*. 4th ed. Alberta, Canada; Saunders Elsevier; 1997.
4. Available at www.Dash.com. Accessed January 2008.
5. Beaton D, KaczJ, Fossel A, Wright J, TarasukV, Bombardier C. Measuring the whole or the parts? validity, reliability, and responsiveness of the Disabilities of Che Arm, Shoulder, and Hand outcome measures in different regions of the upper extremity. *J Hand Ther*. 2001; 14: 128-142.
6. Mulligan BR. *Spinal and Peripheval manual therapy treatment techniques of Brian R. Mulligan*. East Hampstead, NH: Northeast Seminars; 2007.
7. Matias R, Pascoal AG. The unstable shoulder in arm elevation: A three-dimensional and electromyographic study in subjects with glenohumeral instability. *Clinical Biomechanics*. 2006; 21: S52-S58.
8. Paine RM, Voight M. The role of the scapula. *JOSPT*. July 1993; 18:No.1: 386-391.
9. Lippitt S, Matsen F. Mechanisms of glenohumeral joint stability. *Clinical Orthopaedics and Related Research*. 1993;No.291:20-28.

Thank you!