Effective Treatment of Adhesive Capsulitis Utilizing Soft Tissue and Joint Manipulation – A Case Study

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Author’s contribution
The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

Background and Purpose: Adhesive capsulitis is a common condition, but outcomes have been mixed. It is possible that Physical Therapy can be an effective intervention.

Case Description: This case study details a demographically typical patient with adhesive capsulitis who experienced full recovery with Physical Therapy.

Outcomes: External rotation improved from 45 to 95 degrees in 8 weeks, pain decreased from 8/10 to 0/10, and the patient made a full recovery of ADLs.

Discussion: Unique to this case were three aspects. First, joint mobilization, either through manual therapy or dynamic mobilization, was directed towards placing the head of the humerus into the center of the glenoid cavity. Second, soft tissue manipulation freed tight tissues, reducing pull on the humeral head, enhancing the joint mobilization. Finally, microcurrent injury detection was used to direct treatment and modalities toward injured areas. This case suggests that directed joint mobilization combined with soft tissue mobilization and guided modalities through microcurrent injury detection can be a useful protocol for treatment of adhesive capsulitis.

Keywords: Soft tissue injuries; musculoskeletal manipulations; adhesive capsulitis; shoulder pain.
1. INTRODUCTION

One of the more common and debilitating shoulder conditions is adhesive capsulitis, commonly referred to as frozen shoulder [1]. Classically, this presents as a marked loss in shoulder range of motion (ROM) especially external rotation 1, with a 2-9 month painful “freezing phase” where range is lost, a 4-12 month “frozen” phase, and a “thawing phase” where range is re-gained [2]. Demographically, the incidence rate is higher amongst women in the 5th decade of life [3], with higher incidence with diabetic subjects [4]. Unfortunately, the exact etiology of adhesive capsulitis is poorly understood [4,5]. Aside from clinical presentation, imaging diagnostic criteria is still being researched [6,7], and this condition can occur post-trauma or from idiopathic causes [3]. Treatments also vary from noninvasive therapy to injections and surgery [8-10], with varied results even for similar treatments [1,11,-16]. The purpose of this case study was to describe a demographically typical patient’s response to physical therapy with focuses on soft tissue and joint manipulation. Informed consent was obtained in writing from the subject of this case for both treatments and for the publication of this case.

2. CASE DESCRIPTION

This case involves a 48 year old female who was diagnosed with L sided adhesive capsulitis from an orthopedist. Pain began several months prior insidiously, and increased to 8/10 by faces with end range motion. Along with the pain increase, her left shoulder range of motion decreased, now with external rotation most restricted of all motions in her opinion. Patient history was unremarkable with no previous injuries to her shoulder or neck nor systemic diseases. Functionally, she presents with maximum difficulty dressing, especially with her bra. Bathing also presented maximum difficulty with towelisng, along with placing objects on shelves.

2.1 Assessment

On initial examination, left sided flexion and abduction were 165 degrees, external rotation was 45 degrees, and internal rotation was 30 degrees, functionally able to reach to L5 behind the back. Right shoulder ROM was full, with external rotation demonstrating hypermobility at 95 degrees. External rotation strength was 3/5 and scapular stabilizer strength was 4/5. The GH joint demonstrated anterior and inferior glide restrictions 2/6, with 8/10 pain demonstrated with overpressure.

Also utilized was microcurrent injury detection, which from previous research, demonstrates strong correlation to other objective measures of injury, including diagnostic ultrasound and blood tests [17-20]. This detected 60% or greater decreased conductance, consistent with tissue injury, [17,18,20] at the glenohumeral (GH) joint, long head of the triceps, and pectoralis minor during the course of treatment.

2.2 Interventions

Typical treatments included soft tissue manipulation which loosens tight soft tissue structures by addressing both physical and neurological components [21], on palpated tight tissues mostly in the anterior GH joint, therapeutic exercises to the rotator cuff and scapular stabilizer muscles, and joint mobilization and manipulation mostly inferior and posterior glide to place the head of the humerus into the center of the glenoid fossa. In early treatments, where the patient experienced significant pain, much of the manipulation was a dynamic mobilization technique where isometric exercise created the mobilization force vectors, allowing for mobilization with minimal discomfort. Specific exercises included theraband rotator cuff exercises with the red theraband, serratus anterior wall pushups, bodyblade PNF D1/D2, and others. Electrical stimulation at 7 hz at a moderate muscle contraction level, for 10 minutes, was used on the first visit and the tenth with pads placed on the GH joint and the long head of the triceps.

3. RESULTS

During early treatments, when the patient was in significant pain, a dynamic mobilization technique was employed instead of the usual joint mobilization or manipulation. Here, the affected shoulder was passively moved to a pain-free end-range, such as flexion. Then isometric exercise was applied so that the line of force would match the desired line of mobilization. For example, at end range flexion, resisted extension would create a degree of superior to inferior glide of the humeral head. Care was taken to avoid pain either through range or intensity modification. This allowed for mobilization which
would otherwise have been ineffective due to a high level of pain.

After 3 visits, active-assist range of motion (AAROM) internal rotation behind the back increased from hand at L5 to hand at T11. After 5 visits, AAROM external rotation increased from 45 to 60 and internal rotation increased to hand at T8. After 7 visits, active range of motion (AROM) external rotation increased to 80, internal rotation with hand to T7, and flexion to 175.

On the 10th and 12th visits, the patient experienced a minor exacerbation, that is an increase in symptoms and decreased progress, with AAROM ER decreased to 60, AROM flexion to 160, and IR with hand to T8. Electrical stimulation was applied in the same 10 minute duration and protocol on these visits along with the other therapies.

After the 13th visit, the patient’s condition returned to its previous progress before the exacerbation, with AROM external rotation to 80, internal rotation to T6, and flexion to 175.

On the 15th visit, a small area of injury was detected in the pectoralis minor with microcurrent conductance. After soft tissue mobilization and lengthening therapeutic exercise to the pectoralis minor, AROM external rotation improved to 90 at 90 degrees abduction and AROM flexion to 180 degrees, full range according to some schools and textbooks.

Subjectively, from the 16 to 17th visit, over one week, the patient experienced the feeling that her shoulder was doing well. She was able to do yoga and did not experience trouble with toweling or placing objects on shelves. She only noticed pain if she externally rotated over 95 degrees at 120 abduction, basically stretching back far. This improved with manual therapy to her pectorals, posterior deltoid, and infraspinatus.

Patient was treated 19 times for a period of 12 weeks, with 2 treatments per week on most weeks.

4. DISCUSSION

Adhesive capsulitis is a debilitating condition from causes not fully understood, but can respond well to both invasive and non-invasive treatment. Typical non-invasive procedures were used with great success in this case, but several items deserve to be highlighted.

Her range of motion increased quickly after treatments to place the humeral head in the center of the glenoid fossa, thus restoring biomechanics. However biomechanics could only be restored once four things occurred. First was the recovery of the injured state. This was determined by microcurrent injury detection, which shows strong correlation with diagnostic ultrasound [17,18] which demonstrates changes with adhesive capsulitis [6]. Specifically, microcurrent detected injured areas at the glenohumeral joint capsule, long head of the triceps, and the pectoralis minor. Once these areas were addressed, immediate benefits resulted, especially the pectoralis minor which allowed for the return of subjectively “normal” movement. When the injured areas were identified, electrical stimulation (7 hz, 10 min, motor level stimulus) was applied with pads directly on these areas. As electrical stimulation increases circulation [22], it would be expected that this would speed recovery, which appears to be the result in this case.

Second was the flexibility of periarticular structures, determined by myofascial techniques. Soft tissue manipulation and therapeutic exercise focused on relocating the head of the humerus into the center of the glenoid fossa, loosening the anterior structures, and strengthening the posterior structures. The soft tissue manipulation [21] was a technique developed by the author, used to palpate structures in three dimensions, myofascially stretch restrictions to their tension point, and release them with a short amplitude motion.

Next, glenohumeral joint mobility determined by palpation and joint manipulation or mobilization. Previous studies have shown benefits with posterior glide, which is similar since a majority of subjects demonstrate protracted scapula [23], and likely anterior subluxed shoulders. However, the joint mobilization was performed in various degrees of abduction, with with both inferior and posterior glide, guiding the head of the humerus into the center of the glenoid cavity throughout scapulohumeral motion. Also when pain was a limiting factor in early treatments, a dynamic mobilization technique, utilizing the patient’s own muscles to mobilize, was effective.

Finally, neurological re-education was required to regain the proper coordination of the rotator cuff
and other shoulder girdle muscles. Although full textbook range of motion was achieved on the 15th visit, it was not until the 17th visit that the patient subjectively felt that her shoulder was working normally. Some of this may be due to her natural hypermobility.

5. CONCLUSION

This case demonstrates that a protocol to relocate the head of the humerus throughout scapulohumeral rhythm, supported by electrical stimulation, and allowing a few visits after full range is achieved can result in excellent outcomes for patients with adhesive capsulitis. Also, even after full range is achieved, an additional few treatments were required before the patient experienced the subjective feel of normal movement.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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