Adhesive Capsulitis Management: A Case Study

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ABSTRACT

Objective: To report the case of a 53-year-old male post-Comprehensive Arthroscopic Management (CAM) surgery for adhesive capsulitis and describe the rehabilitation process, including all phases of rehabilitation.

Clinical Features: A 53-year-old male presented to the clinic with visible bruising on the left medial humerus. MRI before the CAM procedure revealed severe degeneration and evidence of a previous labral repair. Positive examination findings included significantly reduced range of motion (ROM) in all planes and pain with specific movements.

Intervention and Outcome: The initial treatment, post-surgical clearance, involved passive range of motion (ROM) exercises, pendulum swings, chiropractic adjustments, and manual therapy. Subsequent sessions incorporated active ROM exercises, core stability training, and neuromuscular exercises. ROM improved progressively, enabling the patient to lift his arm unassisted. Pain decreased significantly, and functional activities improved.

Conclusion: This case demonstrates the successful post-surgical rehabilitation of adhesive capsulitis using a multimodal approach, including chiropractic adjustments, targeted exercises, and manual therapy.

Key Indexing Terms: Adhesive Capsulitis; Chiropractic Adjustment; Rehabilitation; Core Stability; Shoulder Exercises; Reactive Neuromuscular Training

INTRODUCTION

Adhesive capsulitis, commonly known as "frozen shoulder," is a condition characterized by stiffness, pain, and restricted ROM in the shoulder joint. This condition often results from injury, surgery, or prolonged immobilization leading to inflammation and capsular tightening.[1] Patients with adhesive capsulitis typically experience insidious onset shoulder stiffness, moderate to severe pain that worsens at night, and near-complete loss of passive and active external rotation of the shoulder.

Adhesive capsulitis follows a three-stage process which starts with the freezing stage. The freezing stage is a reactive process from either a trauma or a lack of movement in the joint itself that tends to elicit pain and discomfort.[2] The second stage of the process is the frozen stage which is typically less painful. However, the range of motion for the shoulder decreases and the thickening of connective tissue begins to develop during this stage. The last stage is the thawing stage in which the patient has a gradual increase of ROM in the shoulder joint.

If conservative non-surgical treatments are not providing relief for someone with adhesive capsulitis such as NSAIDs, chiropractic, physical therapy, ultrasound and passive modalities, there are various surgical options that are available. NSAIDs can be helpful in reducing pain and improving mobility in the early short-term stages for adhesive capsulitis due to their nature of decreasing inflammation and pain. However, NSAIDs are not a long-term solution for the underlying cause of adhesive capsulitis. Ultrasound therapy for adhesive capsulitis treatment may help to reduce associated pain by decreasing inflammation. The high-frequency sound waves produced by the ultrasound device can penetrate the skin and tissues, producing a deep heat effect that can relax the muscles, improve blood flow, and reduce pain.[3] The goal for chiropractic care for adhesive capsulitis is to focus on relieving pain, improving range of motion, and enhancing the overall function of the glenohumeral joint/scapular movement through manual therapies, adjustments to the shoulder girdle, and soft tissue work.[4]

Surgical options for shoulder conditions include arthrographic distension, total shoulder replacement (anatomical or reverse), and partial shoulder replacement. Arthrographic distension involves injecting fluid - such as saline, corticosteroids, or a combination - into the shoulder joint to treat adhesive capsulitis (frozen shoulder). This helps expand the joint capsule and break up adhesions, thereby improving mobility and reducing pain and stiffness.[5] Anatomical total shoulder replacement involves replacing both the ball and socket of the shoulder with implants that replicate the joint's natural anatomy. This procedure is commonly performed for patients with osteoarthritis, rheumatoid arthritis, or severe fractures. In contrast, reverse total shoulder replacement also replaces the ball and socket but switches their positions: the ball is attached to the scapula, and the socket is attached to the upper humerus. This technique is often used when the rotator cuff is irreparably damaged and unable to support shoulder function. Partial shoulder replacement involves replacing only the head (ball) of the humerus. It is typically indicated for patients with damage or arthritis isolated to the ball portion of the shoulder, often resulting from a fracture.[6]

Comprehensive Arthroscopic Management (CAM) surgery is often employed in severe cases to release capsular adhesions and restore mobility, providing a joint-preserving option for patients with advanced conditions. CAM is an arthroscopic procedure where a surgeon uses a small camera and surgical instruments to access the shoulder joint to release the tight, scarred capsule tissue causing the restricted movement.[7] This report highlights the rehabilitation strategies employed in the case of a 53-year-old male post-CAM surgery.

CASE PRESENTATION

History

A 53-year-old male sought care at a chiropractic office for significant reductions in ROM, weakness and pain following CAM surgery for adhesive capsulitis of his left shoulder. He had begun physical rehabilitation as ordered by his surgeon the previous week with a local establishment. The patient also wanted to add chiropractic care to his care management plan due to positive outcomes with previous care experiences. Pre-surgical MRI findings demonstrated severe degeneration and previous surgical labral repair which was reported by the patient to have been performed ten years previously. Post-surgical initial examination revealed obvious visual bruising on the left medial humerus and decreased ROM in all planes and pain exacerbated by specific movements. The patient was actively being co-managed with physical therapy exercises twice per week through a rehabilitation facility concurrently with chiropractic care which included spinal and scapulothoracic manipulation, instrument assisted soft tissue mobilization, proprioceptive neuromuscular facilitation (PNF) and pin and stretch techniques.[8]

Diagnosis

The patient was diagnosed with adhesive capsulitis based on clinical findings and imaging results, consistent with established diagnostic criteria.[9]

Clinical findings included decreased ROM in all planes of motion, both active and passive. Initial exam findings discovered left shoulder flexion 110 degrees, extension 40 degrees, abduction 110 degrees, external rotation 30 degrees, and internal rotation 30 degrees. Orthopedic exam findings of the left shoulder revealed positive Neers (Impingement), Hawkins (Impingement), Lift Off (Subscapularis), Adduction/Internal Rotation (Infraspinatus), and Jobe Tests (Supraspinatus), with Belly Press (Subscapularis) and Drop Test (Rotator Cuff Tear) demonstrating negative results.

Management and Treatment Plan

The treatment strategy for adhesive capsulitis involves addressing capsular tightness and inflammation to improve ROM and reduce pain.[2] Arthroscopy is an excellent additional tool for addressing the shoulder with adhesive capsulitis and has become well-accepted in treating this process,[9] while CAM surgery specifically has been validated as an effective joint-preserving surgical option for addressing adhesive capsulitis and advanced osteoarthritis.[7] Therefore, CAM surgery was utilized to release capsular adhesions and restore shoulder function, aligning with evidence supporting its efficacy in advanced cases.[7]

Post-surgical intervention consisted of physical therapy exercises, tailored to the patient's condition, which were pivotal in improving ROM and reducing pain, consistent with established approaches.[10,11] Chiropractic adjustments utilized focused techniques to address joint restrictions involving the medial scapulothoracic region and cervicothoracic junction. Manual therapy was employed to target the rotator cuff, triceps, deltoid, and bicep musculature. Additionally, passive modalities such as laser therapy, shockwave therapy, and TENS (transcutaneous electrical nerve stimulation) were applied to the treatment areas. Neuromuscular training consisted of band-assisted arm extensions for reactive neuromuscular control.[8] To lengthen the constricted rotator cuff and surrounding musculature, stretching exercises were performed in office and recommended as part of his home exercise program (HEP). Gradual progression to active exercises with active ROM and strengthening exercises were later added to his HEP.

Phase 1: Pain Relief & Mobility (Weeks 1-4)

Pendulum Stretch: Stand and lean forward with one arm hanging down. Hold onto a stable surface with the other hand (like a chair). Swing the affected arm in small circles, gradually increasing the size of the circles. Perform for 30 seconds to 1 minute. Repeat 2-3 times per day.

Finger Walk: Stand facing a wall with your fingers at waist height. Slowly walk your fingers up the wall as high as possible, then lower them back down. Do this for 10-15 repetitions. Repeat 2-3 times per day.

Towel Stretch: Hold a towel with both hands behind your back, one hand over your shoulder and the other at your lower back. Use your unaffected arm to pull the towel upwards, gently stretching the involved shoulder. Hold for 20-30 seconds and repeat 5-10 times. Perform 2-3 times a day.

Chiropractic Adjustments (Weeks 2-4)

Spinal Adjustments: Focusing on the thoracic (upper back) spine. Misalignments in these areas can cause muscle tension, poor posture, and nerve compression that can exacerbate shoulder pain. Adjustments to these areas may improve overall posture, reduce muscle tension, and enhance nerve function.[4]

Shoulder Girdle Adjustments: Adjustments to the posterior scapulothoracic region focusing on scapular retraction. The goal is to target the affected shoulder blade to improve movement, which can help alleviate pain and stiffness.[4,12]

Phase 2: Gradual Mobility & Restoring Range of Motion (Weeks 4-8)

Cross-Body Stretch: Bring the affected arm across your chest. Use the unaffected arm to gently pull the affected arm closer to your chest. Hold for 20-30 seconds and repeat 5 times. Perform 2-3 times a day.

Active Assisted Shoulder Flexion: Sit with your back against a chair and use your unaffected arm to help lift the affected arm overhead. Hold the position for 5-10 seconds, then lower it slowly. Repeat 10-15 times. Perform 2-3 times a day.

Shoulder Extension Stretch: Stand or sit tall and hold a long object like a bar/stick behind you with both hands. Use your unaffected arm to gently push the affected arm backward. Hold for 20-30 seconds, repeat 5 times. Perform 2-3 times a day.[13]

Chiropractic Adjustments & Trigger Point Treatment (Weeks 4-6)

Spinal and Shoulder Joint Mobilization*:* Grade 3 and 4 mobilizations were used to improve joint mobility in the scapulothoracic region, acromioclavicular joint, and glenohumeral joint. Gentle, controlled grade 3 and 4 mobilizations can help increase flexibility without overstretching.[4,12]

Soft Tissue Therapy*:* Techniques like myofascial release and trigger point therapy can be used to reduce tightness in the muscles around the shoulder, upper back, and neck. This can help reduce pain and improve blood flow to the affected area.[7]

Phase 3: Strengthening & Stabilization (Weeks 8-12 and Beyond)

Isometric Shoulder Exercises: Stand with your back straight and your arm at your side. Press your hand against a wall or object without moving your shoulder. Hold for 5-10 seconds and repeat 10 times. Perform 2-3 times a day.[13]

External Rotation: Stand with your elbow bent at 90 degrees. Hold a resistance band in both hands. Keep your elbow at your side and rotate your forearm outward, away from your body. Perform 10-15 repetitions. Repeat 2-3 times per day.[13]

Shoulder Press: Hold light weights (1-3 pounds) in both hands. Press the weights overhead and lower back down slowly. Perform 10-15 repetitions. Repeat 2-3 times a day.

Wall Push-Ups: Stand a few feet away from a wall and place your hands on it at shoulder height. Slowly lower your body toward the wall, then push back up. Perform 10-15 repetitions. Repeat 2-3 times a day.

Chiropractic Adjustments & Postural Shoulder Strengthening (Weeks 6-12)

Spinal Adjustments: Focusing on the cervicothoracic region to alleviate stiffness/pain in the brachial plexus region. Adjustments in this area may help alleviate any compensatory patterns in the neck and upper back that might be causing additional strain on the shoulder.[4,14]

Strength exercises: The last phase is to strengthen the rotator cuff and scapular stabilizers. These muscles are key for shoulder stability and proper movement. Resistance band exercises to improve external rotation and scapular retraction. Shoulder presses and rows to strengthen the deltoid, rotator cuff, and upper back muscles.

Intervention and Outcome

During the first session, the focus was on gently mobilizing the patient's shoulder with passive range of motion exercises and pendulum swings. Manual therapy was also applied to relieve tightness in the surrounding muscles. This approach led to noticeable pain relief and an improvement in mobility.

As treatment progressed, the patient transitioned to active range of motion exercises, including wall slides and overhead reaches, to promote greater muscle engagement. Core stability work, such as planks and side-lying rotations, were introduced to improve overall function and support shoulder movement. To enhance stability and control, neuromuscular training with resistance bands was added. Soft tissue techniques, including instrument-assisted soft tissue mobilization, proprioceptive neuromuscular facilitation, and targeted stretching, were applied to the latissimus dorsi, pectoralis minor, subscapularis, teres minor, and deltoid to further increase mobility and reduce muscular restrictions.

Over time, the patient showed significant improvements in shoulder mobility. Flexion increased from 110 to 132 degrees, extension improved from 40 to 53 degrees, and abduction rose from 110 to 135 degrees. External rotation expanded from 30 to 65 degrees, while internal rotation improved from 30 to 63 degrees. Pain levels dropped by more than 75%, going from 4/10 to 0-1/10 on the visual analog scale. With these gains, the patient was able to carry out daily activities with minimal discomfort, only experiencing mild pain in certain positions.

DISCUSSION

This case highlights the importance of a structured, individualized rehabilitation program following CAM surgery for adhesive capsulitis. Combining chiropractic adjustments, manual therapy, and targeted exercises proved effective in reducing patient pain, improving shoulder ranges of motion in all planes and enhancing functional abilities while returning the patient to better than pre-surgical function for all shoulder-related activities. **Figure 1** demonstrates the severity of pain and ROM in respect to time in the stages of adhesive capsulitis. The "freezing" stage shows that pain is severe, with significant limitations in motion. Durations of the severity can last from 6 weeks to 4 months. The "frozen" stage is characterized by severe loss of range of motion. This is also associated with a decrease in pain, resulting in a scenario where ROM is decreased for 4 to 12 months. Lastly, the "thawing" stage shows pain is minimal, but stiffness can linger. Full mobility returns gradually in 6 months to 2 years and can be accelerated with physical therapy, NSAIDs and other conservative treatments.[15] Overall, the faces on the graph show time (x-axis) and severity (y-axis) with three emotional states. The emotional states are angry/sad face (freezing phase - high pain, low mobility). Neutral face (frozen phase - reduced pain but still restricted movement). Happy face (thawing phase - recovery and increased mobility).

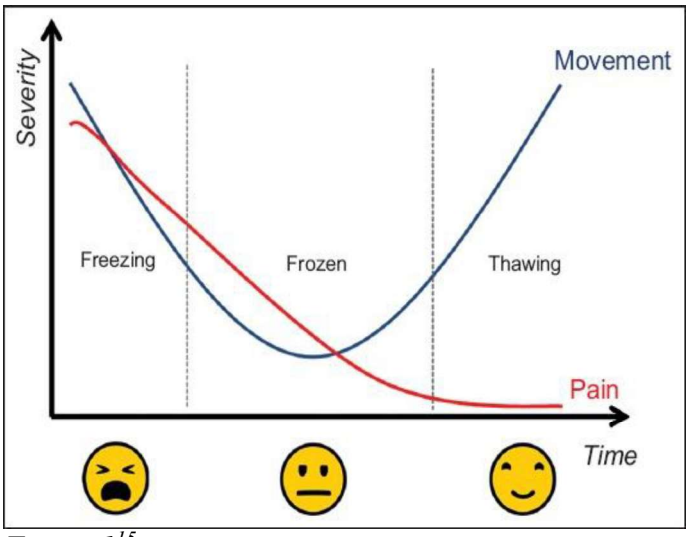

Figure 1[15]

The primary goals were to focus on stretching and joint mobilization, normalized scapular kinematics,[2] periscapular strengthening with isometrics or against gravity, and to implement a home exercise program for shoulder stretching 2-3 times daily. Physical therapy exercises were provided in combination with home stretches.[10] The patient's at home stretches/exercises included shoulder ROM exercises in all planes of motion using both concentric and eccentric emphasis. These planes of motion include forward flexion, internal and external rotation, lateral abduction, and cross body adduction.

Alternative Research Outcomes

Physical therapy remains a cornerstone of adhesive capsulitis treatment, demonstrating significant improvements in pain and function compared to passive modalities.[10] Alternative treatment options to use in frozen shoulder therapy include passive treatment modalities such as local heat, ice, ultrasound, shockwave, and dry needling.[2] There are also options of NSAIDs, local steroid injection, hydrodistension, and manipulation under anesthesia.[9] NSAID studies to treat frozen shoulder show that reduction of pain in early stages may benefit better than rehabilitation or placebo but this is not shown/maintained for the long term.[16] NSAIDs are typically recommended for short-term use to manage acute pain and inflammation in the early stages of frozen shoulder. Over-the-counter doses of NSAIDs like ibuprofen or naproxen can be taken for pain relief. Interarticular injections can be poorly tolerated due to the procedure not requiring anesthetization. This can cause significant pain during the procedure making it slightly less desirable.[16] These injections are powerful anti-inflammatory agents that help reduce swelling, pain, and inflammation in the shoulder joint. They are especially beneficial during the freezing stage when inflammation is high. Manipulation under anesthesia (MUA) has the drawback of stretching tissues while the patient is unconscious, which can lead to pain upon waking and potentially delay recovery. When surgical release is combined with MUA, it introduces additional trauma to the shoulder, which may further slow rehabilitation. Despite these concerns, many patients experience notable improvements in range of motion and pain relief shortly after the procedure, with some regaining up to 80–90% of shoulder function.[9]

The procedure can provide long-lasting relief, particularly when combined with a comprehensive physical therapy program post-procedure. Arthroscopy is a valuable tool in the management of adhesive capsulitis and is widely accepted as an effective treatment approach. The primary pathology involves tightening of the coracohumeral ligament, the rotator interval, and contraction of the joint capsule, including the axillary pouch. These structures can be released using arthroscopic instruments, helping to restore range of motion - often supplemented by manipulation when needed.[9] Overall, most of these studies demonstrate various degrees of improvement in pain scores, ROM, and function regarding treatment options.

Limitations

The findings are based on a single case and may not generalize to all patients. Additionally, long-term follow-up was not conducted to assess sustained improvements.

Implications

This case emphasizes the need for multidisciplinary approaches in managing adhesive capsulitis, integrating surgical intervention with comprehensive rehabilitation strategies and chiropractic care.

CONCLUSION

This report demonstrates successful post-surgical management of adhesive capsulitis using chiropractic adjustments, manual therapy, and targeted exercises. Reactive neuromuscular training was particularly beneficial in re-establishing shoulder stability, while core exercises supported overall kinetic chain functionality.[8] The outlined care plan provides a valuable reference for clinicians in managing similar cases, underscoring the importance of individualized, multimodal rehabilitation programs.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

COMPETING INTERESTS

The authors declare no competing interests.

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