The effects of Myofascial techniques on shoulders for postural imbalance and associated pain: a case study

ABSTRACT

Background: Shoulder disorders are not only painful, but also impair a person's ability to perform basic tasks at home or work. They are frequently linked to postural imbalances, which may stem from working in artificial positions for extended periods of time. Numerous shoulder disorders present with similar symptoms, making them difficult to diagnose. Treatments for various shoulder disorders range from rest and analgesics to surgery.

Objective: To study the impact of Myofascial techniques on undiagnosed shoulder pain using a numerical rating scale to measure pain throughout the study.

Methods: The subject, a 21 year old male, presented with undiagnosed shoulder pain, forward head posture and medially rotated shoulders. The goal was to improve posture and ease the associated pain. The study period consisted of 4 consecutive weekly sessions, using myofascial techniques and stretching to target the muscles found to be locked short on the upper body. Progress was measured with a range of motion and postural analysis before and after every session as well as with a numerical rating scale for the pain before and after each session and on a daily basis for the duration of the study period. Functional limitations were also monitored.

Results: Pain decreased after each session and daily pain levels were reduced over the course of the study period. Range of motion and posture were improved as well as some functional limitations. A 12 week follow-up revealed the client's pain levels were still reduced and range of motion was beginning to become impacted again, though the functional limitations were still greatly improved.

Conclusion: The results suggest that Myofascial techniques and stretching can be used to improve range of motion and postural imbalances in addition to easing associated pain, but more research is needed.

Keywords: Shoulder disorders, Myofascial, Range of motion, Posture, Massage

INTRODUCTION

Pain, weakness, and loss of motion in the shoulder joint can drastically hinder someone's ability to work as well as perform daily tasks such as dressing, eating and brushing their hair.\textsuperscript{1} Studies have shown that work that involves repetitive motions, extended periods spent in artificial positions, or poor posture can cause neck pain and shoulder disorders.\textsuperscript{2,3} Self-reported shoulder pain is the third most common cause of consultation with a primary care physician for a musculoskeletal condition\textsuperscript{1,3}; about 1% of adults consult a general practitioner with new shoulder pain each year. Because several shoulder disorders present in similar ways, the criteria for diagnosis aren't always agreed upon, making it difficult to determine the best options for treatment.\textsuperscript{1}

Postural imbalances such as forward head and forward shoulder have been linked to chronic shoulder disorders.\textsuperscript{3} Carpal Tunnel Syndrome (CTS), Mouse Shoulder and Cervical Pain Syndrome are frequently associated with jobs that involve extensive computer work because of the working position's strain on the
The client has had no related injuries or surgery. A family history was unavailable to look for similar shoulder disorders. The client attributes his symptoms to his job, which he had just begun 3 months before the pain started. His job involves driving 3 to 8 hours a day and repairing machines, which consists of frequent lifting as well as reaching over head for extended periods of time.

During the intake, the client indicated that he is left handed and while his issue is in both shoulders, his left is usually slightly more affected. He described his pain as dull, aching, intermittent, deep and recurring, and noted that the pain is sometimes also felt in his lower neck (he gestured to the upper trapezius region). He specified that the pain is like a sore muscle after working out, and his pain level is usually a 7 on a 0-10 pain intensity numerical rating scale (NRS), and has occasionally reached a 9. He experiences pain on average 8 hours a day, with the intensity getting progressively worse from Monday through Friday, then easing over the weekends. He stated that pain is not always present, however his shoulders constantly feel tense. He also experiences weakness and feels his range of motion is limited in both flexion and extension of his shoulder. He has had to modify the way he performs daily activities such as driving, using a computer, reaching overhead, reaching in front of him (shoulder level), carrying in front of him, and lifting in an effort to alleviate pain or compensate for his loss of motion. He identified driving, reaching overhead and lifting as the tasks that are most affected by the pain as well as the ones that aggravate the pain the most. He experiences pain after driving for 10 minutes, reaching overhead for 2 minutes, and immediately after lifting.

A posture analysis revealed drastic medial rotation in both shoulders, his right shoulder is elevated and both scapulae appear winged, the left more so than the right. His left arm rests in a slightly abducted position with his left forearm more pronated than the right. He maintains a head-forward position with his head tilted to the right. I also assessed his passive range of motion (ROM) and noticed several limitations. He compensated his passive range of motion (ROM) and noticed several limitations. He compensated quickly when demonstrating flexion with each shoulder. Extension seemed slightly impacted for both shoulders, with the right shoulder having less movement than the left. Medial rotation of both shoulders was moderately restricted and he reported that any lateral rotation was painful. Flexion of the neck was moderately restricted while extension did not seem impacted. Lateral rotation and lateral flexion to either side was very limited and painful.

Treatment

The chosen treatment method was intended to help correct postural imbalances with myofascial release and some light stretching. Since the client's new job required him to hold uncomfortable positions for extended periods and that seems to be what causes the pain, the theory is that by treating the posture and the muscles that had become locked short, the pain should ease. The treatment plan consisted of four consecutive weekly sessions of 60 minutes each. Each session would begin and end with the client demonstrating his ROM in front of a posture grid, with pictures being taken of his posture and each action to show the changes in his ROM and posture over the course of the study.

The first session began with a thorough intake and assessment, pictures of the client's ROM and posture, passive touch and 25 minutes of myofascial work on pectoralis major, upper trapezius and anterior deltoid along with ironing the upper trapezius and stretching the neck. More pictures were taken at the end of the first session. The 3 following sessions consisted of 50 minutes of a predetermined
treatment routine with 5 minutes at the beginning and end of each treatment period designated to taking pictures of the client. Before and after each session, the client also answered a short questionnaire about his pain, rating it with a NRS and marking on a diagram where the pain was.

To begin the treatment, the client was asked to lie in a supine position with appropriate bolstering throughout the treatment. Passive touch was used to introduce touch to the client and to help him relax. Using palms, the shoulders were depressed alternately for two minutes in order to stretch the upper trapezius. Myofascial stretching techniques were then performed bilaterally, using the palm of the hand, on the sternum and subclavius for 10 minutes, on the upper trapezius for 5 minutes, on the anterior deltoids for 4 minutes, and 10 minutes on serratus and subscapularis which also used a loose fist. 4 minutes were spent stripping along subclavius with reinforced fingers and raking pectoralis major with thumbs. 5 minutes were then spent on an active resisted stretch for Pectoralis major: with the heels of the hands placed against the superior border of pectoralis major, the client was instructed to slowly raise his arms (flex the shoulder) to a 90° angle to his body. As he raised his arms, more pressure was placed against the pectoralis major. Then with fingers hooked under the inferior edge of pectoralis major to hold the muscle in place, the client was instructed to slowly lower his arms (extend the shoulder) until his arms were once again resting on the table. This was repeated for the duration of 5 minutes. 5 minutes were spent on the neck: using a modified petriassage on the posterior neck, circular friction with fingertips on the suboccipital region, and applying traction to the occipital ridge with fingertips. The final 5 minutes were spent ironing over the shoulders, upper trapezius and sternocleidomastoid, with a loose fist.

Passive touch concluded the treatment to reconnect with the client.

The client’s primary goals were to decrease the average pain level for each day and to increase the amount of time he could drive without pain. He also wanted to generally improve his range of motion, but focused on flexion of his shoulder. During the second, third and fourth treatments, in order to access his serratus and subscapularis muscles, the client’s arm was abducted approximately 90° and his elbow flexed. The first time he was put into that position, he stated that he was uncomfortable because his hand couldn’t rest on the table, so a pillow was placed under his arm. This issue was only with the left arm, the right rested on the table with no problems. After the session, he requested to add another treatment goal: to be able to lay his left arm flat by his head without a pillow to support it.

Several measures were taken to analyze the client’s progress. An intake questionnaire and interview assessed his level of pain, how he described the pain, what caused it, and what his limitations were. As mentioned before, pictures were taken before and after each treatment to demonstrate posture and ROM. Before and after each session, he was given a short questionnaire regarding his pain level and indicated on a diagram where he felt pain. He was also given a series of questions to answer each day throughout the case study regarding his average pain level for the day, his worst pain, and how long he could perform his three most affected tasks (driving, reaching over head and lifting) until he experienced pain. Another interview was conducted 3 months after the last session to reassess his pain level. Throughout the case study, the client was instructed to drink plenty of water and try to be more aware of his posture throughout the day. He was also asked to try to take breaks when driving for long periods of time and to stretch regularly.
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RESULTS

The pictures of the client's posture and ROM showed drastic improvements. His shoulders were still medially rotated, but did show moderate improvement. His right shoulder no longer appeared elevated, and the winging of his scapulae was mildly reduced. His left arm's abducted position was almost completely corrected, though his left forearm still rested in a pronated position. He still held a forward head posture, but it had been moderately reduced. His head still tilted to the right very slightly. The client's range of shoulder flexion was significantly improved and there was no compensation. Extension had improved only slightly, the right shoulder still being more limited than the left. Medial rotation of both shoulders showed mild improvements, and the client was able to perform lateral rotation without pain, though it was moderately restricted. Flexion of the neck was significantly improved, and extension still did not appear affected. Lateral rotation and lateral flexion to either side was no longer painful and had greatly increased range of motion.

The client's pain level consistently decreased after each treatment. His pain level dropped an average of 2.9 points after treatments, the biggest improvement being 4 points after Treatment 3. His average daily pain level also showed notable improvements. Since the client indicated that the pain got progressively worse throughout the week, it could be useful to look at the data by the weekdays; comparing the four Mondays of the study to each other, the four Tuesdays to each other, etc, to look for improvement from one week to the next. All days showed an improvement ranging from 1 to 3 pain levels, the average pain level decrease from week 1 to week 4 was of 1.89.

The time the client could spend performing those three main tasks showed great improvements as well. At the beginning of this study, the client complained of pain after driving for 10 minutes. During week 4, he reported driving 25 minutes without pain. From week 1 to week 4, most days had improved by 10 minutes, the average increase being 9.17 minutes. Since the client did not drive on Sundays, this was calculated with only 6 days in the week. The time he could spend reaching overhead increased from 2 minutes to 10 minutes. Where lifting previously caused immediate pain, he was able to lift for 5 minutes during the final week of this study.

The client was re-interviewed 12 weeks after the final session. He indicated that some pain has returned, but it is not as severe as it was before treatments. His average daily pain is a 2 and he is able to drive 30 to 45 minutes without pain. He also stated that reaching overhead and lifting are no longer as painful for him. He feels that he may have lost some range of motion again, but not to the point of causing pain. He explained that since the treatments, he hasn't had to drive as much and the rest has really helped reduce the everyday pain. Also, he is now very mindful of his posture, drinks plenty of water, and when he is driving for long periods he stops at least every half hour to stretch.
DISCUSSION

The client did not drive on Sundays, so it is not a zero, but rather a lack of data for those days. I left a gap in the chart in order to better show the progression of the week.
This case study has demonstrated that massage can be an effective treatment for postural imbalance and related shoulder pain. The client's goals were met with a decrease in pain level an average of 1.89, an increase in the length of time for pain-free driving by 9.17 minutes and his overall range of motion was increased, shoulder flexion significantly so. As for his final treatment goal, to eliminate the need for a pillow supporting his arm in treatment, the pillow was discarded in only the second treatment. By the final treatment, his arm rested comfortably flat on the table.

The treatment plan originally consisted of 5 sessions; however the client cancelled the final session. In order to keep the sessions consistently on consecutive weeks, rather than rescheduling, the study was completed after the fourth treatment. Throughout the study, the client was reminded to drink water, stretch regularly and take breaks when driving for an extended time. He did not comply with any of these. However, upon checking back with the client 12 weeks after the treatments, he stated that he had begun doing all of those things and found them to be beneficial. Finally, as was mentioned several times throughout this report, pictures were taken of the client's posture and ROM. The client had originally agreed to have the pictures taken and included in the report. At the conclusion of the case study, however, he requested that the photographs not be released.

Throughout the course of this study, the client voiced that he felt the treatments were extremely beneficial. After the final treatment, he enthused about his increasing range of motion. When he looked over the before and after pictures, he was surprised at how limited his motion was in the beginning. He stated that he just couldn't believe that he had just accepted those limitations. During the 12 week re-interview he attributed his low pain rate primarily to the treatments. He also expressed an interest in seeking out massage regularly to prevent his pain from increasing.

Much of the research I came across was focused on a certain disorder. Since the client's condition has not been diagnosed, I cannot compare my results to those of other studies. Many studies agree that treatment should be multimodal, and massage is gaining recognition as a viable approach. However, more research is needed.

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