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Case Study

Upward pulling plus exercise improves scapulocostal pain and scapular position

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Abstract. [Purpose] To investigate the effect of upward pulling combined with shoulder retraction (upward pulling plus exercise) on scapulocostal pain and scapular position. [Subject and Methods] A 22-year-old woman with severe pain in the right and left scapulocostal areas. The horizontal distance from the inferior angle to the spinal process was measured. The tester assessed scapulocostal pain after stretching and massage. The tester assessed pain after upward pulling plus exercise. [Results] Left and right scapulocostal pain reduced to 2/10 after the upward pulling plus exercise. The horizontal distance from the inferior angle to the spinal process also decreased. [Conclusion] Upward pulling plus exercise might be recommended as a primary therapeutic approach to treat scapulocostal pain or scapulocostal syndrome.

Key words: Computer worker, Pulling plus, Scapulocostal pain

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INTRODUCTION

Scapulocostal pain affects the major and minor rhomboids and levator scapulae muscles. It usually occurs in working people who use the scapular muscles continuously for several hours a day, such as those who work on computers or office-seated workers[1)]. Normal scapular positioning and mechanics can be altered due to weakness of the scapular musculature[2)]. This study developed an upward pulling exercise with shoulder retraction exercise and investigated its ability to reduce scapulocostal pain and improve scapular position.

SUBJECT AND METHODS

A 22-year-old woman reported severe persistent pain for eight months in the right and left scapulocostal areas. An examination revealed her shoulders were rounded anteriorly. The purpose and methods of the study were explained to the participant before her inclusion, and she provided informed consent. The study adhered to the principles of the Declaration of Helsinki. The patient's Visual Analog Scale (VAS) score for pain was 7/10 and 6/10 at the left and right scapulocostal areas, respectively, on palpation. A palpation meter (PALM; Performance Attainment Associates, St. Paul, MN, USA) was used to measure the horizontal distance (HD) from the inferior angle to the spinal process. The HD was determined by placing one caliper arm at the inferior angle of the scapular and the other arm at the spinal process directly horizontal to this point, with an inclinometer reading of zero degrees[3)]. The subject's initial HD was 10.5 cm. The first session of treatment lasted four weeks and included stretching to decrease the tension of the levator scapulae muscle, massage for the rhomboid muscle, and push-up plus for the serratus anterior muscle. The second session lasted two weeks and concentrated only on the selective strengthening exercise of the rhomboid muscle. The existing pulling exercise was transformed to an upward pulling exercise, which involved pulling from beneath to the upper side of the shoulder. Scapular retraction was combined with the last step of the shoulder movement, in which Thera-Band is pulled and then the shoulder is pulled. The tester measured the VAS and HD after each session.

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RESULTS

The VAS score, initially, was 7/10 and 6/10 for the left and right scapulocostal areas, respectively.

The left and right scapulocostal area VAS scores were both 6/10 after the first session and dropped to 2/10 and remained at this value after the second session. The HD was 10.5 cm initially, increased to 11.5 cm after the first treatment session, and then decreased to 8.3 cm after the second session.

DISCUSSION

The stretches and exercises used in the first session are the most commonly used treatment of scapulocostal pain. In this study, these three treatments were applied in combination during the first session, but scapulocostal pain resolution was minimal with these treatments[4]. The scapular downward rotation position did not recover, there was no improvement in shoulder depression. The second session concentrated only on a selective strengthening exercise of the rhomboid muscle, by upward shoulder pulling with shoulder retraction. For this purpose, the existing pulling exercise was transformed to upward pulling which involved pulling from beneath to the upper side of the shoulder, and the upward pulling plus exercise in which the last step of the upward pulling exercise (Thera-Band is pulled and the shoulder is pulled in the last step) is combined with the shoulder retraction exercise was developed and applied. We found that scapulocostal pain significantly decreased after the second session, and the scapular downward rotation position and shoulder depression greatly improved[4]. Scapulocostal syndrome can be caused by various scapular muscles, but the main cause of pain appears to be the weakness or overstretching of the rhomboid muscle. Therefore, stretching exercise and massage only temporarily relieve pain and cannot be fundamental treatments of scapulocostal pain. The pain experienced in scapulocostal syndrome seems to be strongly associated with muscle overstretching due to improper posture. Baskurt et al. reported that increasing muscle strength and correcting scapula positioning corrected the position of affected scapular muscles, which lead to decreases in muscle tension and pain[2]. Kadi et al. found that strengthening exercises stimulated an increase in the number of capillaries around the fibers, leading to increased blood flow and decreased pain intensity[5]. Selective strengthening exercise is the most effective method for restoring the muscles lengthened by overstretching to their normal length[1, 4]. Furthermore, the daily treatment time of the second session took half the time of the first session. The upward pulling plus exercise proposed in this study has been found to be an effective method that can selectively strengthen the rhomboid muscle in a short period of time. Therefore, it might be recommended as a primary therapeutic approach to treat scapulocostal pain or scapulocostal syndrome.

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