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Sternocleidomastoid syndrome: a case study

Babak Missaghi, BSc, DC, FCCRS(C)*

This article presents a case study of a patient diagnosed with dysfunction of the sternocleidomastoid (SCM) muscle, a condition which can result in head and face pain, nausea, dizziness, coryza, and lacrimation. In this particular case, the SCM muscle had developed tightness and weakness with presence of multiple trigger points within both heads. A combination of passive and active treatments were utilized to successfully treat this condition.
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KEY WORDS: (MeSH) chiropractic, manipulation, exercise/rehab (NonMeSH) rehabilitation, sternocleidomastoid, trigger point.

Cet article présente une étude menée auprès d'un patient souffrant d'une lésion du muscle sterno-cléido-mastoïdien (SCM), un état pouvant causer de l'algie craniofaciale, des nausées, des étourdissements, de la rhinite et du larmoiement. Dans ce cas particulier, le muscle SCM était devenu tendu et faible et présentait des zones gâchettes multiples aux deux chefs. On a utilisé une combinaison de traitements passifs et actifs pour traiter ce syndrome avec succès.
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MOTS CLÉS : chiropratique, manipulation, exercice, réadaptation, sterno-cléido-mastoïdien, zone gâchette.

Introduction

The sternocleidomastoid (SCM) muscle has a complex multidirectional pattern of movement. It is composed of clavicular (short head) and sternal (long head) divisions. Both divisions of the muscle attach to the head of the mastoid process and along the superior nucheal line.[1] The sternal division attaches below the sternum and the deeper clavicular branch attaches posteriorly and laterally onto the clavicle. Acting unilaterally, the SCM causes ipsilateral-lateral flexion, contralateral rotation, and lifts the chin superiorly. Acting bilaterally, it causes both flexion of the lower cervical spine and extension of the upper cervical spine.[2]

The SCM may develop myofascial trigger points in both heads.[3] Trigger points are typically taut bands of muscle fibers and are "ropy" and sensitive to pressure when compressed. They can create a local twitch response or "jump sign", which is due to involuntary contraction of muscle fibers.[3] Trigger points usually occur longitudinally along the length of the muscle and are more common in postural axial muscles. The referred pain is often described as deep and dull. Compressing the trigger point will commonly elicit a consistent referral pain pattern.[4] Trigger points can be classified as active or latent, with the former causing constant pain and the latter "silent" until aggravated.

The clavicular division of SCM trigger points can produce pain over the forehead and around the ipsilateral eye, over the cheek, the tip of the chin, sternoclavicular joint and deep in the throat upon swallowing. The clavicular

* Private practice. Walk Rehabilitation,
1200 Lawrence Avenue East, Suite 201, Toronto, Ontario M3A 1C1.

division[3] of SCM has also been documented to play an important role in the sense of equilibrium.[3] The sternal trigger points can cause pain over the ipsilateral and bilateral forehead, inside and behind the ear.[3] The sternal head trigger points may further produce autonomic disturbances, such as excessive lacrimation, conjunctivitis, rhinitis, blurred vision, coryza and ipsilateral eyelid droops – most likely due to spasm of the orbicularis oculi muscle.[3–6]

Case report

History

A 37-year-old, right handed mother of two preschool-aged children presented with complaints of posterior and lateral neck pain, occasional facial numbness, and tingling sensation over her left cheek, forehead, tip of her chin and left ear. These facial sensations were often accompanied by a sensation of dizziness, throat pain upon swallowing, jerking of left eyelid, and excessive lacrimation on the same side. She described these symptoms as intermittent, lasting from minutes to a few hours at a time, with a frequency of three to twelve episodes per week. There was no previous history of such symptoms, nor any other muscular or skeletal conditions. The patient appeared to be within healthy weight parameters, and had experienced no recent, unusual weight gain or loss. She had had no history of accident or blunt force impact that could be linked with the onset of symptoms.

The patient stated that her symptoms began more than three months before, during a time when her youngest child was ill and she spent long periods carrying him with her left arm while performing tasks with her right. She also often slept with her toddler in her arms. She reported that her symptoms had been gradually worsening during the course of the previous two months. The patient initially consulted her family physician in order to rule out possible pathological or systemic causes. A series of blood and urine tests were performed which reportedly all proved to be within normal limits. She was then referred to a neurologist. An MRI of her brain and cervical spine was performed and the results were also unremarkable. She was then referred to a dizziness clinic for evaluation and no specific cause for her dizziness was discovered. The patient sought chiropractic care in our office at that point, since no traditional, allopathic treatments had been offered to her.

Examination

Postural evaluation demonstrated decreased cervical lordosis, anterior head carriage, and bilateral protracted and rounded shoulders. Cervical ranges of motion indicated reduced flexion, with right and left rotation decreased by 20%. While other ranges of motion were within normal ranges, all such tests resulted in some degree of discomfort. Neurological evaluation of both upper and lower extremities was unremarkable. Deep tendon reflexes were 2+ and symmetric. Sensory response to pin prick and gentle touch tests was unremarkable. Muscle strength tests were 5/5 and symmetric throughout.

Evaluation of the cervical spine revealed moderate myofascial pain in the para-vertebral musculature. Deep tissue palpation of the upper trapezius muscle bilaterally indicated presence of multiple trigger points, which referred pain to the sub-occipital area when provoked. Palpation of the left SCM muscle also indicated the presence of myofascial trigger points, which created a significant proportion of the patient's facial pain when provoked. Palpation of left pectoralis- and levator scapular muscles also revealed the presence of trigger points.

Evaluation of the patient's respiration demonstrated a faulty breathing pattern, involving over-utilization of the scalene and SCM muscles.[7] Motion palpation end range provocative testing revealed the presence of painful intersegmental joint dysfunction at right C0–C1, left C2–C3, C5–C6 and T4 levels.[8] A cervical Davis series was requested by the patient's physician. The cervical x-rays demonstrated moderate degenerative changes at C5–C6 levels. No hyper-mobility was detected at any level, and the x-rays were otherwise unremarkable.

Head and neck flexion coordination tests revealed chin juts, meaning an altered neck flexion pattern – possibly due to weak neck flexors and overactive sub-occipitals and SCM.[9–11] Sit-to-stand test was performed, with the patient showing a faulty movement pattern by leading the move with her chin. This test is crucial in distinguishing an over active SCM verses an SCM with trigger points. This test can assist in determining if the injury is recent verses long established faulty patterns. It can also allow the practitioner to observe the SCM muscle in a dynamic setting rather than simply testing for trigger points.[12]

Muscle strength- and length tests of the pectoralis, levator scapula, upper trapezious, SCM, and suboccipitals demonstrated muscle hypertonicity. SCM muscle

length test resulted in partial facial numbness.

Stepping test was performed to assess the functional integrity of tonic neck muscle reflexes which can have an impact on the function of the entire locomotor system.[8] This test is conducted by standing the patient with eyes closed and arms outstretched, horizontal to the floor and parallel to each other. The patient is instructed to step alternately as if marching, alternately raising the knees to 45 degrees. Typically after 50 steps the patient should have rotated no more than 30 degrees. This particular patient, however, was rotated by 130 degrees. One leg standing test was also performed. The patient was able to stand on one foot an average of 20 seconds with eyes open and 5 seconds with her eyes closed. Normal results for someone her age would be a minimum of 30 seconds with eyes open and 21 seconds with eyes closed.[13,14]

Treatment

The result of the examination showed that the patient had developed multiple cervical and thoracic subluxations, poor proprioceptive sense of balance and altered neck flexion due to tightness in the SCM-, upper trapezius-, levator scapula- and pectoralis muscles, as well as weakness in deep neck flexors, lower and middle trapezius-, and serratus anterior muscles. The goals of treatment were to stretch and relax the tight muscles, strengthen the weak muscles, restore the motion of restricted spinal segments, and re-educate the sensory motor system through proprioceptive exercises. These multiple goals were pursued through a program of successive passive and active treatments.

Passive care (3x / week for 2 weeks)

The patient received passive care three times per week for the first two weeks. The treatment included diversified manipulative therapy of the affected joints; trigger point therapy (ischemic compression) of SCM and upper trapezius muscles; passive stretch of SCM, pectoralis, scalenes, suboccipitals, and upper trapezius muscles; and post isometric relaxation (PIR) of the SCM muscle.[15,16]

The SCM stretch was an essential part of the each treatment, with the patient placed in a supine position with her shoulders at the edge of the table, her head held at the base of occiput, rotated away from the affected side, laterally flexed toward the affected side, extended at the lower cervical and flexed at the upper cervical (chin tuck with neck extension). This stretch was held from five to forty-five seconds, dependant on patient tolerance. PIR was accomplished by instructing the patient to actively raise her head slightly when it was rotated. This effort was resisted by the practitioner to allow for an isometric muscle contraction. The SCM muscle was then stretched in the same fashion as before.[10]

Postural advice was provided during the course of passive care to prevent further aggravation of the region. The patient was instructed on exercises to carry out at home three to five times a day. These involved standing with her buttocks and shoulder blades gently against a wall, then slowly retracting her head backward until her skull touched the wall. This position would be maintained for thirty seconds. The goal of this exercise is to make the patient aware of their posture and over time to develop better postural habits.

Phase I Rehabilitation (3x / week for 4 weeks)

The second phase of treatment started in week three with the addition of a rehabilitation component to the passive care described above. This phase was performed at a frequency of three times per week, and lasted for four weeks. The patient was re-evaluated once every two weeks so appropriate modifications to the exercises could be implemented.

Initially the patient was trained on proper self stretch of the upper trapezius-, pectoralis major and minor-, suboccipitals, levator scapula- and SCM muscles. She was then instructed on a number of exercises designed to facilitate the lower-, middle trapezious and deep neck flexors. The muscle facilitation was accomplished through specific exercises, such as the following:

- Wall angels (shoulders abducted, elbows flexed, gradually brought back to sides, while retracting scapula)
- Bruegger exercise (sit at the edge of chair, anterior pelvic tilt, chin tuck, hands turned outward, thumbs up pointing upward and behind shoulders, fingers wide apart)
- Chin tucks
- Dead bug (supine, knees and hips bent, spine in neutral position, maintain abdominal bracing as arms and legs are moved back and forth)
- Quadruped (on hands and knees, spine in neutral position, abdominal bracing, head neutral position, arms

and legs raised)
– Upper back cat (on hands and knees, chin tuck, move buttocks toward ceiling).[7,10]

Proprioceptive exercises play an important role in retraining primary stabilizers of the spine and reprogramming subcortical connections to improve balance.[14] Both rocker and wobble boards were used for proprioceptive training with eyes open for the first week and eyes closed for the second and third week.[14] Isometric neck exercises were conducted during the first week using a medium size ball against the wall to strengthen weak neck flexors, extensors, rotators and in lateral bending. During week three the ball was replaced with surgical tubing which would allow full neck ranges of motion with resistance.[11]

Phase II Rehabilitation (3x / week for 8 weeks)

In this stage the passive treatments such as manipulation and trigger point therapy were performed only when indicated. Previous exercise programs were continued with increased intensity and free weights were introduced to continue to strengthen the lower and middle traps. This was accomplished using the Zinovieff technique for one arm rows, seated rows, shoulder shrugs, shoulder press and upright row and latismus dorsi pull downs. The Zinovieff technique is a good beginner protocol, made of three sets of ten repetitions with one minute interval rests in between, three times per week.[11] The first set is at 10 repetitions maximum (RM), second set 75% of 10 RM and the third set at 50% of 10 RM.

The patient was also trained on proper breathing techniques. Diaphragm breathing inhibits the involvement of overactive accessory breathing muscles and keeps their activity to a minimum during rest.[8] Accessory breathing muscles are designed to assist breathing only during exertion to further expand the ribs but should remain primarily silent at rest.[8]

Once the second phase of rehabilitation was completed, the patient reported experiencing relief from over 80% of her original symptoms. It was clear that the patient's physical and emotional challenges as a mother of two young children could be expected to continue to test her physical limits. Therefore, the importance of a continued self directed exercise program, coupled with occasional supportive care at our office (so as to prevent deterioration of her physical condition to a critical level once again) was discussed. The patient was open to the idea, and appeared determined to follow through with her exercises and an occasional visit to our office to monitor her progress.

Discussion

This patient was diagnosed with sternocleidomastoid syndrome. Her condition was accompanied by the presence of other hypertonic and weak muscles in the upper quadrant. She also showed cervical and thoracic facet dysfunction, faulty breathing patterns, poor proprioception and biomechanically flawed posture. Her symptoms extended beyond just an SCM trigger point, and included established faulty movement patterns in the cervical and thoracic regions. As a result, the decision was made to include an active component in her treatment in addition to passive care. The active treatment was designed to restore normal biomechanical movement pattern of the upper quadrant in order to reduce postural strain. The patient's over all treatment included a total of 44 passive and active treatments. This number does not reflect a “cookie cutter” formula for all patients with SCM syndrome, but rather, corresponds to the specific needs and preferences of this patient.

Once the patient was taught all the necessary exercises, she was given the option to continue with some of the exercises at home in order to reduce the number of office visits. However, she chose to follow through with the rehabilitation component at our centre in order to remain motivated.

Short term results of chiropractic rehabilitation in this particular case were very favorable, although long-term outcome is not known at this time. Further research is required to evaluate long term outcome for patients who have received treatment with an active and passive approach to treatment, verses passive only treatment, to gain further insight to management of SCM syndrome.

Conclusion

The fact that such an array of symptoms as facial pain, lacrimation, dizziness, blurred vision and eyelid jerking could be generated from an activated trigger point was not a diagnostic possibility entertained by any of the practitioners who previously examined the patient. This case demonstrates the pivotal role chiropractors can play in multi-disciplinary settings, working along with other

heath practitioners and sometimes, perhaps, offering not only a different but also constructive point of view. The chiropractic approach, combined with appropriate rehabilitation tools and techniques, can prove a highly valuable asset in early diagnosis and correct treatment of such conditions.

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