



Chiropractic Treatment of Temporomandibular Dysfunction: A Retrospective Case Series



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Abstract

Objective: The purpose of this study is to describe chiropractic treatment of 14 patients who presented with signs and symptoms of temporomandibular joint dysfunction (TMD).

Methods: This is a retrospective case series of 14 patients, including 13 adults and 1 child. The majority of these patients were undergoing chiropractic care for spine-related conditions when they presented with additional TMD signs and symptoms. They were evaluated and treated with Activator Methods International published protocols relative to the temporomandibular joint before the addition of treatment to the suprahyoid muscles.

Results: All pre- and postadjustment assessments were recorded using a numeric pain scale. The resulting average showed a reduction in the patients' pain scores from the initial visit of 8.3 ± 1.6 to the last visit at 1.4 ± 1.1 with an $80.9\% \pm 15.4\%$ improvement. The average number of visits was 13.6 ± 8.2 .

Conclusion: All patients selected for this case series showed a reduction of temporomandibular dysfunction symptoms.

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Introduction

Temporomandibular dysfunction (TMD) is a set of conditions affecting the temporomandibular joint (TMJ) and/or the surrounding masticatory musculature. Temporomandibular joint and muscle disorders are a group of conditions creating pain and dysfunction in

the jaw joint and the muscles controlling jaw movement. The National Institute of Dental and Craniofacial Research reports that as many as 10 million people have TMJ disorders.¹

Temporomandibular dysfunction may be present as 1 or more of the following symptoms: (1) pain in the jaw joint or in the muscles of mastication; (2) audible popping, clicking, or crepitus accompanying jaw movement; and (3) aberrant movement upon opening or closing the jaw joint.² The involvement of the temporomandibular disk has been reviewed and

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implicated as the cause for the audible crepitus or clicking during mandibular movement.³ Head or neck trauma may put a person into a higher risk category, and factors including skeletal malformations or occlusal abnormalities can alter the mechanics of TMJ function.⁴ Other proposed causes of TMD include nutrition, psychosocial factors, and disturbed sleep patterns involving clenching, teeth grinding, and bruxism.⁵ Sex seems to be a factor in reported cases of TMD; the proportion is 2 or 3 times more prevalent in females than in males.⁶

At present, published studies on TMD chiropractic treatment do not address the suprahyoid musculature. We suggest that the muscles involved with TMJ function could develop imbalances and trigger points that may contribute to the complex of TMD symptoms. The purpose of this case series is to describe chiropractic treatment of 14 patients who presented with signs and symptoms of TMD, which included evaluation and treatment of the muscles of the suprahyoid region.⁷

Case Series

Patients

The medical records of 14 patients with signs and symptoms of TMD were selected for this case series, 13 female and 1 male. The average age was 42.6 ± 14.5 years. The presenting signs and symptoms are illustrated in Fig 1. All patients reported in this study provided informed consent to have their anonymized clinical information published in this paper.

Treatment Procedure

Below is the description of the standard evaluation and treatment procedures used for these 14 patients.

1. Follow published Activator Methods International (AMI) basic and advanced protocols, including the 5 TMJ Isolation Tests.
2. Apply digital pressure to the suprahyoid muscular area (Fig 2) under the mandible on the side of the functional short leg or pelvic deficiency, and recheck the leg length. If the leg shortened in the prone position, then move to 3. If no change occurred in leg lengths, apply digital pressure on the side opposite of the functional short leg or opposite pelvic deficiency. If leg length reactivity occurs, continue to #3.

inability to open mouth correctly with right ear pain
clicking of the jaw upon opening the mandible
clicking, locking and stiffness upon mouth opening
jaw and ear pain with frequent clicking
popping when opening jaw, and increasing pain on chewing
clicking on the left side of the jaw, when opening mouth to full extent
pain in jaw from clenching and a temporal headache
jaw pain from clenching with occasional headache
headache and chronic jaw clicking
clicking and pain upon jaw opening
clicking and pain upon jaw opening and jaw clenching
various joint pains, including jaw pain
jaw pain from palate expander and malocclusion
jaw pain from clenching

Fig 1. TMD signs and symptoms.

3. Patient is repositioned into the standing or supine position for the adjustment using the Activator II Adjusting Instrument with the 1-ring setting. The adjustment is applied to the same area identified in number 2, making 1 to 2 thrusts in a posterior, slightly superior line of drive (Fig 3). Note if the

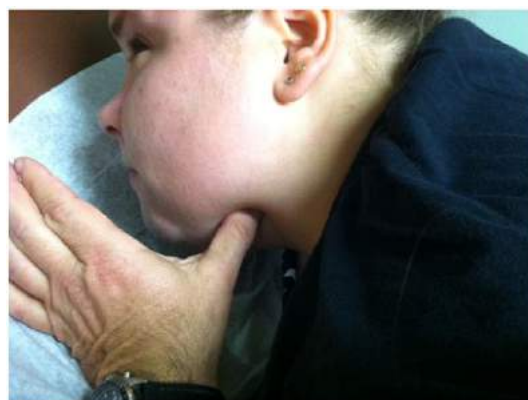


Fig 2. Suprahyoid pressure test. Digital pressure is applied to the suprahyoid muscles, trying to locate areas of tenderness and spasm which create change in the prone leg length. Test the short leg side (pelvic deficient) first; if no reactivity, test the opposite leg (opposite pelvic deficiency) (note that for photographic illustration, patient's head is turned out of the neutral, prone posture). (Color version of figure appears online.)



Fig 3. Adjustment with the Activator II Adjusting Instrument on the 1-ring setting at the point of tenderness and leg length reactivity (shortening) change. Line of drive is in a posterior and slightly superior direction in the anatomical position. (Color version of figure appears online.)

area is sensitive and tender to the patient; the adjustment is performed through the doctor’s digit. Postadjustment analysis is performed, and if the area was corrected, it should reveal balanced leg lengths in the supine position.

4. If the main symptom is a “clicking jaw,” the patient is in the standing position, and the clinician applies digital pressure to the suprahyoid region while the patient actively depresses the mandible (Fig 4). The patient is instructed to open the jaw several times until the point of elimination or reduction of the “clicking” is observed.
5. The adjustment is produced at the exact point of contact which eliminated the clicking; the line of drive is in a posterior, slightly superior direction (Fig 3).
6. As a postadjustment test, the patient is asked to reopen the jaw, and the outcome is reported by the patient. If the symptoms improve or are absent, the procedure ends. If the symptoms persist, further points in the suprahyoid region can be investigated using digital pressure, as we did in number 4.
7. Treatment ends with a balancing of leg lengths in positions 1 and 2 or the elimination or reduction of the clicking jaw.

Twelve of the patients were under care for non-TMD complaints before they presented their TMD signs and



Fig 4. In the case of clicking upon mandibular depression, the patient is asked to open his or her mouth while the doctor applies pressure to the suprahyoid muscles until the symptomatology reduces. (Color version of figure appears online.)

symptoms, and 2 patients presented with TMD difficulties as their primary complaint. The number of chiropractic visits for the presenting complaints with the Activator protocol only was 5.57 ± 9.7 . The number of visits with the Activator protocol and the suprahyoid treatment was 13.6 ± 8.2 . The total number of visits was 18.9 ± 15.3 . The details for each participant are illustrated in Table 1.

Table 1 Number of Chiropractic Treatment Visits for the Presenting Complaints, Number of Visits With TMD Treatment Protocol, and Total Number of Visits Including Average and SD

Patient	No. of Visits With Activator Methods Protocol	No. of Visits	
		With Activator Methods Protocol and Suprahyoid	Total No. of Visits
1	24	25	49
2	0	3	3
3	0	12	12
4	28	15	43
5	0	18	18
6	15	30	45
7	3	6	9
8	0	19	19
9	8	16	24
10	0	11	11
11	0	7	7
12	0	6	6
13	0	19	19
14	0	3	3
Average \pm SD	5.57 ± 9.7	13.6 ± 8.2	18.9 ± 15.3

All pre- and postadjustment assessments were recorded using a verbal numeric pain scale. The resulting average showed a reduction in the patients' pain scores from the initial visit of 8.3 ± 1.6 to 1.4 ± 1.1 on the last visit, resulting in an $80.9\% \pm 15.4\%$ improvement. For individual results, see Table 2.

In the cases for this article, the practitioner palpated the general area and felt for tenderness and muscle tonicity. Also, in the cases of audible "clicking" of the jaw upon opening, slight digital pressure was applied to different points in the suprahyoid region in an attempt to find the exact location of reduction or elimination of the clicking. In almost every case, there was a point of digital pressure on the suprahyoid muscle that eliminated or reduced the audible nature of the "clicking" sound along with associated aberrant motion. This immediate response permitted us to treat the area with confidence. Because the suprahyoid region and anterior neck contain critical soft tissue structures, namely, the carotid arteries and the baroreflex receptors, we felt that the Activator instrument is ideally suited for treating this area.

Discussion

This case series describes the reduction of symptomatology in 14 TMD cases. To our knowledge, there is no previously reported chiropractic management of TMD that includes consideration of the suprahyoid musculature.

Table 2 Verbal Numeric Pain Scale for Each Patient Pretreatment and Posttreatment; the Average, SD, and the Percentage of Improvement

Patient	Pain Pretreatment	Pain Posttreatment	Improvement Percentage
1	9	0	100
2	10	1	90
3	10	0	100
4	10	1	90
5	10	3	70
6	9	1	88.9
7	8	3	62.5
8	8	2	75
9	7	2	71.5
10	7	1	85.7
11	10	0	100
12	6	1	83.3
13	6	3	50
14	6	2	66.8
Average \pm SD	8.3 ± 1.6	1.4 ± 1.1	80.9 ± 15.4

0 = No Pain and 10 = Worst Pain

The literature includes treatment considerations to reduce TMD symptoms including warm compresses on the area of pain, anti-inflammatory medication, and a diet of soft foods. One study used static stretching and global postural reeducation which equally reduced pain intensity and decreased electromyographic activity.⁸ In addition, various medical and dental treatments include custom bite guards (oral splints),⁹ invasive interventions with the injection of botulinum toxin,¹⁰ medications such as hydroxyline,¹¹ and even surgical replacement of the TMJ joint.¹² Orthodontic treatments, in long-term follow-up studies, concluded neither a treatment nor preventive option for TMD. In a literature review, 20 articles relating orthodontics to TMD found positive effects of orthodontic treatment on signs and symptoms of TMD; however, none showed a statistically significant difference.¹³

This case series reports specific trigger point treatment of the suprahyoid muscle with an Activator adjusting instrument. It was demonstrated that the Activator adjusting instrument was a tool that could be used to address trigger points.^{14,15} Other technology used to treat trigger points could also be used.^{16,17} Other studies have demonstrated the usefulness of trigger point therapy, acupuncture, and laser therapy.^{8-13,18}

According to *The Activator Method, Second Edition*, "the protocols and procedures used, seek to establish normal, or as near normal as possible, biomechanics of the TMJ in order to restore jaw function that are as normal as possible. This, in turn, relieves many of the symptoms associated with aberrant jaw mechanics."¹⁸ The authors stated that "these adverse effects may involve accessory structures such as muscles, tendons, ligaments, and secondarily involved joint complexes (e.g. the cervical spine)."¹⁸

The anterior neck muscles involved with depression of the mandible are critical to the movement of mouth opening. The movements of the mandible include elevation, depression, abduction (combined movements producing lateral motion of the jaw), retraction, and protraction. Elevation of the mandible is created by the temporalis, masseter, and medial pterygoids muscles. Depression of the mandible is produced by the lateral pterygoid and the anterior belly of the digastric. In addition, forced opening includes the suprahyoid and infrahyoid muscles. Abduction is associated with the posterior fibers of the ipsilateral temporalis, and the contralateral medial and lateral pterygoids. Retraction is associated with the posterior fibers of the temporalis and possibly some fibers of the masseter. Protraction is created primarily by the lateral pterygoid with support from the medial pterygoids and the masseter.

Muscles attaching to the hyoid bone include the digastric, mylohyoid, stylohyoid, geniohyoid, sternohyoid, thyrohyoid, and omohyoid. These muscles are considered for this project because they are involved in the voluntary movement of the TMJ.

The anterior belly of the digastric muscle runs from the inferior-medial portion of the mandible to the upper surface of body of the hyoid bone. The digastric muscle is essential in maximal depression of the mandible² its posterior belly is especially active in swallowing and chewing. It is considered secondary to the lateral pterygoids in mandibular depression. Other infrahyoid muscles, the sternohyoid, sternothyroid, and thyrohyoid, act as antagonists to the suprahyoid group, functioning to stabilize the hyoid bone by exerting an inferior pull on it, thus rendering the suprahyoid muscles able to depress the mandible.

The approach in this case report targets the musculature of the TMJ that aims to balance neuromusculoarticular function. As it states in *The Activator Method, Second Edition*, “Restoring balance removes or minimizes the adverse effects of unequal load distribution on the TMJs, in effect improving function, motion, and the reduction/elimination of pain.”¹⁸ Our aim is to introduce structure balance and symmetry, thus, the consideration of a global entity composed of the head, neck, and jaw, as they are considered a functionally interrelated unit.¹⁷

Limitations

The information used in this case series was from patients in a private office setting, and therefore the findings are not part of a controlled study. Patients sought chiropractic treatment for other areas of spinal symptomology, whereas TMD was the primary complaint for 2 patients. The clinician did not use a specific TMJ Oswestry or other TMJ-specific outcome measure tool. This could have improved the patients' subjective reporting of their functional changes in a more objective way.

It is not prudent for the authors of this article to comment on any other type of trigger point treatment utilization for this sensitive area. Manual techniques should be used with caution in this area of the neck. Further studies and discussion will be needed to test the reliability of this work. Hopefully, this case series presentation will expand the knowledge acquired for TMD treatment for further discussion to promote better treatment of TMD conditions.

Conclusion

The patients selected for this retrospective case series showed a reduction of their temporomandibular dysfunction symptoms by adding treatment to the suprahyoid musculature.

Funding Sources and Conflicts of Interest

No funding sources were reported for this study. Dr Fischer is a contributing author to *The Activator Method, Second Edition*; is an Independent Contractor for Curriculum Development for Activator Methods International; and has served as a previous Advisory Board member of Activator Methods International.

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