The Effects of Massage and Postural Correction on Trismus: A Case Report

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Abstract

Purpose: The objective of this case report was to determine the effects that massage and postural correction had on a woman with trismus and temporomandibular joint (TMJ) pain. Participant: The 42-year-old woman’s primary symptoms were trismus upon waking when she forgot to wear her bite guard with associated TMJ pain which spreads from her jaw to her head and sometimes shoulders. These symptoms were reportedly caused by stress and bruxism. Intervention: Five 2.5 hour treatments including massage therapy and a thorough initial postural assessment were given over the course of five weeks. Progress was monitored by the postural assessment, range of motion testing, pre- and post-treatment VAS for overall pain, and a daily recording of TMJ pain on a VAS including room for any relevant qualitative data. Results: The patient no longer felt the need to wear her bite guard after the third treatment and recorded no instance of trismus since that time. Maximal laterotrusion significantly increased bilaterally and the patient recorded only one instance of TMJ pain since the third treatment, compared to the seven before. Conclusion: Despite the beneficial results obtained, much more extensive studies are needed to investigate potential applications of massage to trismus and TMD in general.

KEYWORDS: TMD, trismus, massage, bruxism, temporomandibular joint, Neurosomatic Therapy
Introduction

The word trismus, from the Greek 'trismos', is defined as a prolonged, tetanic spasm of the jaw muscles by which the normal opening of the mouth is restricted. The designation was originally used only in tetanus, but as inability to open the mouth may be seen in a variety of conditions, the term is currently used in restricted jaw movement regardless of aetiology.¹ Common causes of trismus include infection, trauma, dental-treatment related, temporomandibular joint dysfunction (TMD), tumors and oral care, drugs, radiotherapy and chemotherapy, congenital, and other miscellaneous causes such as hysteria and lupus erythematosus.² Trismus may impair eating, impede oral hygiene, restrict access for dental procedures and adversely affect speech and facial appearance. In a busy (dental) practice, it is not unusual to see several patients each month with a complaint of trismus.² Treatment of Trismus is also an important issue on the global health stage, since Trismus is a potential result of Noma (when survived). Noma is a debilitating gangrenous disease of the orofacial region known as the “face of poverty.”³ Furthermore, surgical correction of post-Noma-restricted mouth opening in Africa is of special difficulty.⁴ It is the opinion of the author that a streamlined manual therapy approach could be very beneficial in areas such as third-world countries where medical supplies may be scarce.
Traditional treatment of trismus typically entails heat therapy, analgesics (aspirin is typically sufficient), a soft food diet, and muscle relaxants. However, there is considerable variance depending upon aetiology.² Night guards are commonly prescribed as a palliative measure for bruxism, TMD, and associated disorders (such as trismus). However, the use of a night guard seems to have caused unilateral migrainous headaches in one patient.⁵ One study was inconclusive on the effect of occlusal splints in treating sleep bruxism, lacking evidence to show an effect upon sleep outcomes, though it did find them beneficial for tooth wear.⁶

Trismus centers around the temporomandibular joint (TMJ), which happens to be the most frequently used joint in the body, moving 2000-3000 times per day.⁷ The TMJ’s are bilateral, compound, synovial joints, with dense, nonvascular fibrous connective tissue covering the articular surfaces, located on the mandibular condyle and the glenoid fossa of the temporal bone. Between the articular surfaces is an articular disc also composed of dense nonvascular fibrous tissue. The articular disc is tightly bound to the lateral and medial poles of the condyle and attaches anteriorly to the joint capsule. Posteriorly, the disc continues as a thick double layer of vascularized connective tissue which splits and, superiorly becomes a fibroelastic layer attaching to the posterior aspect of the glenoid fossa and inferiorly continues as a fibrous layer attaching to the posterior aspect of the
condylar neck. The disc essentially divides the joint into upper and lower compartments and functions as a third bone in the articulation allowing ginglymo-arthrodial (hinge-sliding) movements. The articular disc is a key factor in its biomechanics. The condyle articulates against disc for most hinge type movement during early jaw opening (20-30mm). The disc and condyle then function together to glide down the articular eminence for full jaw opening.⁸

**Figure 1**, by Mimi Flower, based upon Travell and Simmons,⁸ showing the articular disc displacing anteriorly, preventing the condyle from reducing over the posterior portion of the disc into the disc depression.
An opening lock or subluxation occurs when the condyle is anterior to the articular eminence; the condyle is unable to return posteriorly and the jaw cannot close. A closing lock or subluxation occurs when the disc is displaced anteriorly and the condyle cannot reduce over the posterior portion of the disc into the disc depression (see Figure 1); the jaw cannot open more than 10mm and often there is premature dental contact on the same side as the disc displacement. However, the TMJ is part of a musculoskeletal mechanism that not only has to do with jaw movement but also head position. The opening width of the mouth is also restricted by Trigger Points found in muscles that are distant from the joint itself: SCM, trapezius, the scalenes, and the pectoral muscles. TMD is the most common cause of pain in the orofacial region of non-dental origin. (Magnusson T 2000) Symptoms of TMD vary, including: spasm and/or pain in head, jaw, neck, and shoulder muscles; headache; earaches; jaw clicking, jaw deviation, limited jaw opening, clenching or grinding teeth; and dizziness. Common treatment options for TMD include: splint therapy, occlusal adjustment, analgesic medications, surgery, acupuncture, trigger point injections, hydrotherapy, therapeautic ultrasound, electromyopathy, hypnorelaxation, cognitive-behavioral therapy, massage therapy, stress management, and biofeedback. Middle aged females are most likely to identify and seek treatment for TMD. One study
found massage to be the most frequently used of all CAM therapies for TMD and related conditions, as well as the most helpful and satisfactory.\textsuperscript{14}

One case report investigated the effect of massage therapy upon a patient whose primary symptoms were pain, decreased range of motion, clicking, and crepitus. Positive results were obtained including an overall increase in neck range of motion, a decrease in stress, an increase in maximal interincisal opening, and a decrease in pain from 7/10 to 3/10 using a numerical pain scale.\textsuperscript{15} Although this patient presents a different set of symptoms, the results are inspiring. The objective of this case report is to determine whether implementing specific massage therapy techniques can decrease the incidence of a 42 year old woman’s Trismus and TMJ Pain.

**Methods**

**Profile of Client**

The patient is a 42 year old woman with trismus and TMJ pain. Her dentist diagnosed her with TMD 15 years ago. She has been told that the cause of her pain is stress and bruxism, and was given a molded bite guard for the upper molars to use each night. If she forgets to use it one night she usually wakes with trismus and TMJ pain the following morning, which spreads to her head and sometimes shoulders. She also had a car accident approximately eleven years ago
(while pregnant) in which the car she was driving was hit from the front/right side while she was stopped and the other car was going approximately 45 MPH. She was also diagnosed with degenerative cervical disc disease by her doctor 3 years ago and has been doing physical therapy to address this condition once per week, on and off for the past two years. She enjoys going to a general relaxation massage therapist once or twice per month.

The patient is married, a mother of two, and currently finishing up a program of training in the Mental Health field. Often when she wakes with trismus the discomfort and associated TMJ pain keeps her from taking care of her children and furthering her career nearly as well as she otherwise could. Her primary method of obtaining relief is to take an afternoon nap, cutting into her time to carry out her normal activities of daily living. The patient’s goals for the treatment were to no longer require the use of a bite guard and eliminate her associated TMJ pain and facial tension. The client was instructed not to make any large changes in her routine.

**Treatment Plan**

The massage therapy treatment consisted of an initial assessment and five treatments, once per week. The first three occurred on Friday, the last two occurring on Tuesday. Each treatment lasted approximately two and a half hours, the first half hour being used for postural analysis in which bony landmarks such
as the anterior superior iliac crest (ASIS), humeral head, greater trochanter, external auditory meatus of the temporal bone, and clavicular head (among others) were measured in the superior-inferior and anterior-posterior dimensions (among others). The clinical supervisor was asked to check any measurements of which the practitioner felt unsure. Five minutes at the beginning and end were used to fill out a VAS for overall pain level and take the TMJ range of motion (ROM) measurements using the TMJ Triangle. Each treatment was focused on addressing the postural distortion evidenced by the chart taken that day (and compared with earlier charts) as well as treating musculature which could be active in creating the trismus itself and associated TMJ pain, especially those housing trigger points with referral patterns matching her pain. The following tools were used in assessment, data collection, and treatment:

- massage table
- massage star
- bolster
- pillow
- goniometer
- TMJ triangle
- plumb bob
- chopsticks
The table below outlines which techniques were used each treatment to address the various dysfunctions deemed most important.

Key: l= left, r=right, bl=bilateral, g=gliding, sc= static compression, f=friction, xf=cross-fiber friction, k=kneading, m*= massage star.

<table>
<thead>
<tr>
<th>Postural Distortion</th>
<th>Treatment, day 1</th>
<th>Treatment, day 2</th>
<th>Treatment, day 3</th>
<th>Treatment, day 4</th>
<th>Treatment, day 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>general relaxation</td>
<td></td>
<td>Cranial traction/compression</td>
<td>Same as day 2</td>
<td>Same as day 2, and suboccipital fascial stretch</td>
<td>Suboccipital fascial stretch</td>
</tr>
<tr>
<td>pelvic obliquity</td>
<td>l iliacus: sc; r glutes, piriformis: sc, f, xf</td>
<td>Same as day 1 and r deep hip rotators: f, sc, xf; bl sacral ligaments and r sacrotuberus: f, sc, xf</td>
<td>Same as day 2 and rocking sacroiliac joint mobilization</td>
<td>Same as day 3</td>
<td></td>
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<tr>
<td>L lateral torso compression</td>
<td>L quadratus lumborum: sc, g, f, xf</td>
<td>L lateral paraspinals: g, sc, xf; l intercostals (m*): sc, xf; l obliques: g, sc, xf</td>
<td>L obliques: g, sc, xf; l side stretch</td>
<td>L side stretch; l latissimus dorsi: sc, k, f; l serratus anterior: sc, f, xf</td>
<td>All of days 1, 3 and 4 besides l side stretch</td>
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<td>R cranial rotation</td>
<td>R splenius capitis: g, sc, xf</td>
<td>Same as day 1</td>
<td></td>
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<td>L scm: f, xf, sc, k</td>
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<td>Low r arch</td>
<td></td>
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<td>L fibularis longus and brevis: g, sc, f</td>
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</tr>
<tr>
<td>TMJ pain referrals</td>
<td>R sternocleido mastoid (scm): f, xf, sc, k</td>
<td>Same as day 1</td>
<td>Same as day 1</td>
<td>Same as day 1</td>
<td></td>
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<tr>
<td>TMD</td>
<td>Bl masseter, r temporalis, l mylohyoid: sc, f, xf, g; intraoral l lateral pterygoid: f, sc</td>
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<tr>
<td></td>
<td>Bl temporalis: sc, f, xf, g; l medial pterygoid: sc; intraoral bl lateral pterygoid: l sc, f, xf, g; bl medial pterygoid: sc. Intraoral l lateral pterygoid: sc, g</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bl masseter: sc, f, xf, g; bl medial pterygoid, bl masseter, bl digastric: g, sc</td>
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<td></td>
<td>Bl digastrics: g, sc, f; bl temporalis: sc, f, xf; bl masseter: sc, f, xf, g; bl medial pterygoid: sc</td>
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The muscles of the TMJ are indicated for treatment of TMD and related disorders. The muscles of the TMJ are indicated for treatment of TMD and related disorders. Trigger points in the SCM can refer to the ipsilateral cranium and jaw.

Improvements in several postural distortions can be seen comparing the postural charts taken at the beginning of the first and fifth treatments. (see Appendices 1 and 2, respectively)

Results

The patient recorded that she forgot to wear her molded upper molar bite-guard and woke with trismus and associated TMJ pain on Days -3, 11, and 13. The patient has not had an instance of trismus since the third treatment.

As seen in the graphs below, MIO and MP did not change much, while MLL and MRL increased moderately over the course of the treatments, going from (after treatment) 5mm to 9mm and 4mm to 9mm, respectively. The graph of the daily VAS indicates a small reduction the average TMJ pain each day. The patient also experienced headaches on eight days of the week before and first two weeks of treatment, with only one headache since the third treatment. In addition,
it was initially noted that when the patient opened her jaw, she initially moved it to the right, then back towards the midline as she reached the end-range of the movement. After the third treatment, MIO had decreased but the jaw opened and closed without laterotrusion and was reported to have felt much better. If she opened the jaw as much as possible, the “C” curve pattern would resurface.

![Graph showing Maximum Interincisal Opening (MIO) Before and After](image-url)
Overall TMJ Pain
Key: * = Headache, ! = Trismus
Discussion

Implementation of specific massage techniques were found to effectively reduce the incidence of trismus and associated TMJ pain for this 42 year old woman. The patient has not felt the need to use her bite guard since the third treatment, nor has she reported a single instance of trismus. Only on Day 25 did she report any TMJ-related pain, and that dissipated after the fifth treatment, which occurred later that day.

Janda hypothesizes that TMJ problems could involve both the muscles of the TMJ (mandibular elevators and depressors) as well as “chain reactions” from postural distortions as distant as hyperextension of the knee. The postural distortions of the entire body are taken into account (especially working inferior to superior, in relation to gravity) in order to understand how and why the jaw muscles can be but a cog in the machine of dysfunctional activity.

Although the results were positive, it is noted that the highest level of TMJ pain recorded on the VAS was only 18mm, out of a total 100mm, designated “the worst pain you have ever experienced,” which makes the overall level of pain hardly noteworthy. In comparison, Pierson gave a drop from 7/10 to 3/10 on a numerical pain scale. Additionally, this 2 week hiatus in chronic pain may be a temporary remission since we only have data for 5 weeks. While the patient
reported positive results from the postural correction, the dramatic results were not obtained until after the work was done on the muscles of the TMJ.

One potentially confounding variable is that the patient showed a strong interest in and belief in the effectiveness of this treatment, as it was explained to her in broad strokes as the treatment progressed. This reduction in her personal confusion regarding the nature and origin of her condition may have reduced her stress and contributed to the results. Studies have shown that psychological factors can have an influence upon TMD.\textsuperscript{19,20}

Pierson obtained positive results treating TMD with a variety of massage techniques both intraoral and extraoral upon the muscles of the TMJ, though in a more general way in that all muscles were treated bilaterally. Muscles indirectly connected to the TMJ (such as pectoralis, upper trapezius, and cervical erector spinae) were also treated, and general postural distortions were noted, including their evolution as treatment progressed. Whereas this patient experienced an increase in MLL and MRL, Pierson measured an increase in MIO (though she did not measure laterotrusion quantitatively).\textsuperscript{15} The author suspects that this subject’s lack of consistent increase in MIO may have been related to the fact that the major presenting symptom of the client was trismus instead of pain. Overall, the author is led to suspect that combining specific massage techniques to address postural distortion and the muscles of the TMJ can be an effective treatment of Trismus and TMJ pain.
Conclusion

In conclusion, while this case report was successful in helping to treat this patients’ trismus and TMJ pain, more research is needed to corroborate these findings and further investigate the mechanism behind these beneficial effects.

Acknowledgements

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Appendix 1
Chart taken during first treatment
Chart taken during fifth treatment
References


