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Rapid Improvement of Limited Mouth Opening and Temporomandibular Joint Pain Associated with Anterior Mandibular Displacement Following Manual Therapy and Occlusal Adjustment: A Case Report

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Abstract

Temporomandibular disorders (TMD) are multifactorial conditions influenced not only by local craniofacial structures but also by cervical, pelvic, and global musculoskeletal alignment. Anterior mandibular displacement can severely restrict mouth opening and hinder accurate occlusal evaluation. This case report describes a woman with acute limitation of mouth opening and temporomandibular joint (TMJ) pain who experienced rapid improvement following manual therapy targeting trunk alignment, followed by selective occlusal adjustment. Maximum mouth opening increased from 25 mm to 55 mm, and pain decreased from a visual analogue scale (VAS) score of 7/10 to 1/10. These improvements were achieved within approximately 25 minutes and were maintained for more than six months. This case highlights the potential importance of addressing whole-body musculoskeletal strain in selected TMD patients and suggests that trunk alignment may influence mandibular position and function.

Keywords

Mandibular Displacement, Manual Therapy, Musculoskeletal Alignment, Occlusal Adjustment, Temporomandibular Disorders (TMD)

1. Introduction

Temporomandibular disorders (TMD) encompass a broad spectrum of musculoskeletal conditions involving the temporomandibular joint (TMJ), masticatory

muscles, and associated structures. They represent one of the most common causes of chronic orofacial pain, affecting up to 10% - 15% of adults [1]. Current diagnostic and management guidelines emphasize conservative, reversible approaches such as patient education, self-management, physical therapy, and stabilization splints [2] [3].

Several studies have demonstrated associations between TMD and cervical spine dysfunction, altered cranio-cervical posture, and impaired deep cervical flexor activity [4]-[7]. The concept of regional interdependence—the idea that dysfunction in one region of the body may contribute to symptoms in another—has gained attention in musculoskeletal medicine [8].

Neuromuscular assessment techniques, including the Bi-Digital O-Ring Test, have been used to evaluate functional changes in muscle activity and postural balance, suggesting potential interactions between global musculoskeletal strain and mandibular function [9]-[11].

Fascial chain models, such as those described in Anatomy Trains, propose that tension within interconnected myofascial pathways can affect distant structures, including the mandible [12] [13]. The relationship between musculoskeletal disorders and orofacial pain has been widely documented, indicating that dysfunction in distant regions may contribute to craniofacial symptoms [14].

Recent studies have further emphasized the importance of cervical posture, global alignment, and neuromuscular control in TMD pathophysiology [15]-[18]. Pelvic and trunk alignment have also been shown to influence mandibular movement and postural control [19]-[21]. Additionally, fascial continuity research supports the interconnectedness of trunk and craniofacial structures [22].

Anterior mandibular displacement is a clinically significant condition that can severely restrict mouth opening, alter occlusal relationships, and complicate diagnostic evaluation. When posterior occlusal contact is lost, the mandible may assume an unstable forward position, often accompanied by pain and functional limitation.

The present case describes a patient with acute anterior mandibular displacement, limited mouth opening, and TMJ pain who experienced rapid improvement following manual therapy targeting trunk alignment, followed by occlusal adjustment.

2. Case Presentation

A woman in her 50 s presented with a 10 day history of limited mouth opening and right-sided TMJ pain. She reported difficulty eating, chewing, and speaking for prolonged periods. The pain was described as a sharp, localized discomfort in the preauricular region, exacerbated by mandibular opening and lateral movements. She denied any history of trauma, parafunctional habits, or systemic musculoskeletal disorders.

Her medical and dental histories were unremarkable. She was not taking any medications and had no prior TMD treatment. The onset of symptoms occurred spontaneously upon waking, with no identifiable triggering event.

2.1. Clinical Examination

Maximum mouth opening was 25 mm, accompanied by pain rated at VAS 7/10. Lateral and protrusive movements were mildly restricted. No joint sounds were detected. Palpation revealed tenderness in the right masseter and lateral pterygoid regions.

Panoramic radiography showed no abnormalities in the TMJ or dentition. There were seven metal inlays and two full-cast crowns in the oral cavity, but none of them showed any abnormalities in shape or other aspects (Figure 1).

Intraoral examination revealed anterior mandibular displacement with loss of posterior occlusal contact (Figure 2). The mandible rested in a forward position, and attempts to guide it into centric occlusion provoked pain (Figure 3). The patient reported difficulty achieving stable occlusion during chewing.

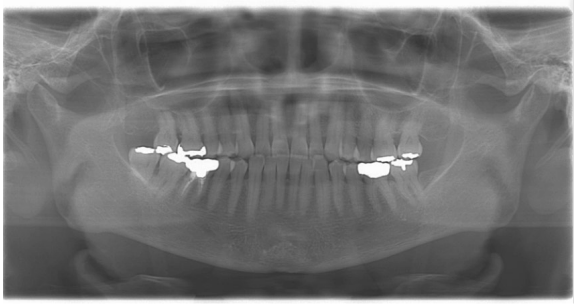

Figure 1. Panoramic radiograph showing no abnormalities in the temporomandibular joint or dentition.

Figure 2. Anterior mandibular displacement with loss of posterior occlusal contact.

Figure 3. Forced retrusion temporarily restored centric occlusion but provoked pain.

2.2. Manual Therapy

Because occlusal evaluation was not feasible due to the unstable mandibular position, manual therapy was performed first. Treatment targeted the sacroiliac joint and acromioclavicular region to reduce musculoskeletal strain because these joint mobilizations were insufficient to improve trunk alignment (Figure 4 and Figure 5). Techniques included gentle mobilization, soft-tissue release, and postural correction.

Figure 4. Manual therapy applied to the sacroiliac region.

Figure 5. Manual therapy applied to the acromioclavicular region.

Following manual therapy, the patient reported a sense of "lightness" in the trunk and shoulders. The mandible spontaneously returned to a near-centric occlusal position without forced manipulation.

2.3. Occlusal Adjustment

Selective occlusal adjustment was then performed on the posterior molars to stabilize centric occlusion. The primary occlusal adjustment involved eliminating occlusal interference at the lingual lateral surface of the right and left upper second molars. A manual muscle response test was used only as an adjunctive cue and not as a diagnostic tool. Neuromuscular response techniques such as the Bi-Digi-

tal O-Ring Test have been used to evaluate functional changes in muscle activity and postural balance [9]-[11], but in this case, adjustments were based solely on conventional clinical findings, including premature contacts and occlusal interferences.

2.4. Outcome

Immediately after treatment, maximum mouth opening improved from 25 mm to 55 mm, and TMJ pain decreased from VAS 7/10 to 1/10. The entire procedure required approximately 25 minutes (**Figure 6**).

Figure 6. Selective occlusal adjustment; mouth opening improved from 25 mm to 55 mm.

At six-month follow-up, the patient remained asymptomatic, with stable occlusion and maintained mouth opening. No self-care or lifestyle guidance was provided.

3. Discussion

This case illustrates the potential influence of trunk alignment and extra-craniofacial musculoskeletal factors on mandibular position and TMD symptoms. The rapid improvement observed after manual therapy suggests that musculoskeletal strain in the trunk and shoulder girdle may have contributed to anterior mandibular displacement.

3.1. Relationship between Posture and Mandibular Function

Previous studies have demonstrated associations between cranio-cervical posture, cervical muscle dysfunction, and TMD [4]-[7]. Altered head posture can modify mandibular rest position, muscle activity, and occlusal loading patterns. Dysfunction of deep cervical flexors has been linked to impaired neuromuscular control of the mandible [7].

Pelvic and trunk alignment may influence mandibular function through myofascial chains and neuromuscular coupling. The sacroiliac region, thoracic spine, and shoulder girdle are interconnected with the craniofacial region through fascial pathways described in Anatomy Trains [12] [13] [22]. Pelvic alignment has been

shown to influence mandibular movement and postural control [19]-[21].

Musculoskeletal disorders in distant regions may contribute to craniofacial symptoms [14].

3.2. Mechanisms of Rapid Improvement

The rapid improvement in this case may be explained by:

- **Reduction of myofascial tension** affecting mandibular posture;
- **Restoration of neuromuscular balance** within the cervical and trunk regions;
- **Improved proprioceptive input** influencing mandibular positioning;
- **Release of compensatory patterns** that maintained anterior displacement.

Recent studies demonstrate that postural correction can improve mandibular function and reduce TMD symptoms [20] [21].

3.3. Comparison with Previous Reports

Several studies have reported improvements in TMD symptoms following physical therapy, cervical mobilization, or postural correction [10] [11] [15]-[18]. However, few reports describe such rapid and substantial improvement in mouth opening and pain.

3.4. Limitations

This is a single case report, and causality cannot be established. The specific contribution of manual therapy versus occlusal adjustment remains unclear. Further research, including controlled studies, is needed to clarify the biomechanical mechanisms underlying these observations.

4. Conclusion

This case demonstrates that TMD symptoms associated with anterior mandibular displacement may improve rapidly when manual therapy targeting trunk alignment is combined with occlusal adjustment. Considering musculoskeletal factors beyond the TMJ may enhance treatment outcomes in selected patients.

Informed Consent

Written informed consent was obtained from the patient for publication of this case report.

Supplementary Material

A video documenting the patient's progress is available on YouTube: *Treatment of TMD with jaw displacement using chiropractic treatment and occlusal adjustment* https://www.youtube.com/watch?v=JpR6rpbvHTM.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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