

Effect of Physiotherapy Intervention in Temporomandibular Joint Dysfunction

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Abstract

Background: Temporomandibular joint (TMJ) dysfunction is a shocking however insufferable condition of the human body. Temporomandibular joint (TMJ) dysfunction is a challenging and often unbearable condition characterized by pain in the joint and surrounding muscles, often resulting in stiffness, complications, earache, malocclusion, clicking sounds, and trismus. TMJ dysfunction is frequently linked to imbalances in the body, particularly in the neck and shoulders. Misdiagnosis or inadequate management can lead to chronic pain syndromes, which can be distressing for patients. This condition may present as acute or chronic; while acute TMJ dysfunction is commonly managed with manual reduction, chronic cases are more complex.

Case Description: We report the case of an 18-year-old male athlete referred by his dentist for conservative management of TMJ dysfunction. He presented with left jaw pain for the past four months, limited mouth opening, jaw clicking, and difficulty chewing hard foods, accompanied by tenderness in the neck, mouth, and cheek muscles. We assessed, diagnosed, and proposed treatment options for this patient.

Management & Outcomes: The patient's TMJ dysfunction was managed conservatively through physical therapy as the first line of treatment. By the end of the intervention, he reported being pain-free and had regained normal TMJ function. This case highlights the role of physiotherapy in managing TMJ disorders. Although various treatments exist, evidence for their efficacy in TMD remains limited, and no standard protocol is established. Common treatment options include occlusal splints, cognitive behavioral therapy, and pain medications.

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Result: Non-invasive physiotherapy treatments have proven effective in alleviating symptoms of TMJ dysfunction. The initial focus is on pain relief and muscle spasm reduction, employing techniques such as pulsed ultrasound and manual therapy, including dry needling to address trigger points.

Discussion: TMJ dysfunction may be associated with overall body imbalances, as increased muscle tension in the upper body can lead to compensatory adjustments affecting spinal muscle tension. A conservative management strategy centered on physical therapy is recommended. Physical therapists are well-positioned to provide clinical support for TMD patients, creating rehabilitation plans tailored to each individual's impairments.



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Conclusion: This case report suggests that a conservative management approach, incorporating pain management strategies, muscle strengthening, and the release of trigger points and tight muscles, may significantly benefit individuals suffering from TMJ dysfunction.

Keywords: Temporomandibular joint dysfunction, physiotherapy, pain management, muscle tension, conservative treatment, manual therapy, dry needling, rehabilitation, case report, TMJ disorders.

INTRODUCTION

TMJ is a canopy term overlaying pain and dysfunction of the muscles of chewing and the temporomandibular joints. The maximum vital feature is ache, followed by way of confined mandibular motion and noises from the temporomandibular joints (TMJ) throughout jaw movement.^{1,2} Although TMD isn't life-threatening, it may be harmful to high-quality of lifestyles,³ due to the fact the symptoms can end up continual and hard to manipulate. TMD is a symptom multifaceted rather than a single condition, and it is supposed to be resulting by multiple reasons.^{2,3} However, these factors are poorly unstated, and there is divergence as to their relative importance.³ There are so many treatments available, while there is a lack of evidence for any treatment in TMD, and no widely accepted treatment protocol. Mostly used treatments include application of occlusal splints, psychosocial interventions like cognitive behavioral therapy, and pain medication or others, no irreversible treatment should be carried out for TMD.⁶ The role of Physical Therapy in treatment of temporomandibular joint disorders is less explored and related to symptomatic relief. There is evidence to show that disorders pertaining to the head and neck region are mostly linked to TMD,⁵ which includes headache and cervical spine disorders,⁴ Symptoms include joint sounds which is painful,^{7,8} restricted or pendular range of motions and cranial and /or muscular pain which is also called as orofacial pain.⁹ TMJ disorder affects 25% of the population. TMJ dysfunctions Symptoms occur disproportionately b/w the sexes with much female ratio ranges b/w 8:1 to 2:1. Most patient presenting symptoms are between 20 and 50 years of age. Resemblance of the dislocated temporomandibular joint and muscle weakness treated by using physical therapy. Meta-analysis in 2021 reported that the prevailing of TMD resulted into 31% of adults and 11% for youngsters and youth. Approximation of the dislocated TMJ, Pin, and Muscle weakness may be managed by numerous bodily therapies.

Physiotherapy Approaches in TMD Treatment

1. Manual Therapy

- **Joint Mobilization:** Gentle movements applied to the TMJ can improve range of motion and reduce pain. Techniques may include both passive and active mobilization.
- **Soft Tissue Mobilization:** This involves techniques aimed at releasing muscle tension in the jaw, neck, and surrounding areas, promoting relaxation and reducing discomfort.
- **Dry needling:** This involves techniques used to pain management and reduce trigger point in the jaw, neck, and surrounding areas, promoting relaxation and reducing discomfort.

2. Exercises

- **Range of Motion Exercises:** These help restore normal jaw movement and flexibility. Patients are guided through exercises to improve both opening and lateral movement of the jaw.
- **Strengthening Exercises:** Targeting the muscles of mastication and neck can help improve muscle function and support proper jaw alignment.

3. Postural Education:

- Improving overall posture can alleviate undue stress on the TMJ. Physical therapists often provide education on ergonomic practices and postural awareness to help minimize tension in the neck and jaw.

4. Modalities

- **Heat and Cold Therapy:** Application of heat can relax tense muscles, while cold therapy can reduce inflammation and numb pain.

- **Ultrasound Therapy:** This modality may be used to promote tissue healing and reduce pain through deep tissue penetration.

5. Relaxation Techniques

- Incorporating relaxation and stress management techniques can be beneficial, as stress is often a contributing factor to TMD. Techniques may include guided imagery, deep breathing exercises, and progressive muscle relaxation.

6. Education and Self-Management

- Educating patients about TMD, its causes, and self-management strategies is crucial. This can empower patients to take an active role in their recovery and prevent recurrence.

Etiology

Intra-articular Causes: Intra-articular causes of jaw issues include inflammatory conditions resulting from direct trauma like heavy chewing, grinding (bruxism), or jaw clenching.¹⁰ Internal derangements can involve disc displacement either with or without reduction.¹¹

Extra-articular Causes: Extra-articular causes can be attributed to muscle spasm, leading to significant

pain and restricted jaw movement, known as trismus. This condition typically affects one or more muscles, commonly those involved in chewing.^{10,12}

CASE REPORT

We would like to present a case of an 18-year-old male athlete who presented with complaints of left-sided jaw pain and an inability to open his mouth completely. The patient was apparently well three months ago, but then he began experiencing left-sided jaw pain and difficulty opening his mouth. Additionally, he complained of his jaw “locking” and making a clicking sound at the end range of mouth opening, as well as a deviation of the lower jaw toward the left side. There is mild pain on the affected side, which is dull in nature and non-aggravating; however, the pain increases when he tries to open his mouth. He approached a dentist, who then referred him to a physiotherapist.

Examination

Following a comprehensive assessment, the patient was observed to have limited mouth opening, less than the width of two fingers.¹³ The position of the jaw appeared normal when the mouth was closed. During movement examination, it was noted that the jaw deviates to the left side when the mouth is opened, as depicted in the figures.^{13,18}



Fig. 1: Shows Opening of mouth less than 2 of his fingers and deviation of mouth

There was no sign of swelling at Temporomandibular Joint. There was locking of one side of TMJ and unlocking of another side of TMJ while opening of mouth. After palpation patient have trigger points in muscle of mastication [especially Pterygoid and Masseter muscle and

having tightness in Sterno-cleidomastoid (SCM) and Trapezius muscle and Neck extensors. There is no medical history of Diabetes, HTN, Dental complains and Ear infection.¹⁶ As the patient was an athlete, on assessing his routine we found that he clenched his teeth while running.



Fig. 2: Post T/t intervention, Shows the progression in opening of mouth

Postural Assessment diagnosis:

Temporomandibular Joint dysfunction.^{14,15,17,18,22}

Table 1: Results Pre and Post treatment

Assessing Dates	02/06/2024	17/06/2024	30/06/2024
Mouth Opening	Less than 2 fingers	2 and half fingers	More than 3 fingers
Numerical Pain rating scale	7/10	3/10	1/10
Palpatory Findings-Clicking	+++	+	-
Tenderness	+++	++	-
Activity Limitation	Di-culty in chewing solid food, Difficulty in opening mouth.	Less difficulty in chewing solid food, Di-culty in opening mouth.	-
Post-Intervention Findings	NRS 4/10 Clicking + Deviation toward Lf. reduced	NRS 1/10 Clicking - Deviation toward Lf. minimal	NRS 0/10 Clicking - Deviation toward Lf. Minimal

Treatment

The non-invasive physiotherapy treatment for TMJ dysfunction has proven effective in relieving and managing symptoms. The primary goal is initially focused on alleviating pain and muscle spasms. Pulsed ultrasound is utilized for pain relief, while manual therapy techniques such as dry needling address trigger points.^{27,30}

Manual Therapy: Dry needling session for pain relief and trigger points release.^{25,28} When the pain begin to settle then we start to restore jaw movements and alignment, Treatment may include soft tissue release and intraoral MFR for affected muscle.²⁴ CBR [Cranial base release for

neck muscles. Joint Manipulation and Mobilization technique are used for cervical spine and TMJ for proper positioning and correction of locking of TMJ.²⁶

EMS [faradic stimulation for training of the muscle of mastication

Exercise: Patient was advised to perform exercises to improve coordination, stability and alignment of jaw, strengthening and training of muscles; Exercises like.^{26, 29}

1. Relaxed jaw position
2. 'Goldfish' exercise 1 (with lower jaw partial opening and full opening): Keep tongue on the upper surface of your

mouth, Place one finger on the TMJ, Place your other index finger on your chin, Allow the lower jaw to partially drop down and next time fully drop down and back with help from the index finger, Watch the partial and full opening of your jaw in a mirror to ensure it remains straight, with the tongue kept upwards. {Having the tongue sit on the roof}

3. **'Goldfish exercises 2 [with lower jaw partial opening and full opening]:** Keep tongue on the roof of your mouth, Place one finger on each TMJ, Allow the lower jaw to partially drop down and next time fully relax your tongue and To bring the chin towards the throat, monitor both partial and full jaw openings in a mirror to ensure the movement remains straight.
4. **Mandibular stabilization exercise:** Maintain the jaw in a neutral position, Apply gentle pressure to the jaw using your index finger/thumb on: Opening, to the left, to the right.
5. **Mandibular counteraction exercises [Facilitatory]:** place knuckle of index finger b/w top and bottom teeth. Remove it, keeping the teeth one knuckle apart. Apply gentle pressure to the jaw using your index finger/ thumb on: Opening, to the left, to the right.
6. **Cervical retraction 'Chin Tuck'**

Home Advice

1. Patient is advised to chew the chewing gum to improve the muscle strength and joint stability.
2. Avoid clenching of teeth while running.
3. Chew the food from both side rather than side.

DISCUSSION

Standard Musculoskeletal problem such as TMD require, Multidisciplinary approach to be managed in conjunction with other doctors, such as a Psychiatrist, laryngologist, and neurologist⁷ It is necessary to comprehend the underlying dysfunction connected to the temporomandibular joint (TMJ) and surrounding structures in order to manage temporomandibular disorders (TMD) appropriately.⁹ The recommended conservative management strategy for TMD is physical therapy.

Professionally speaking, physical therapists are in good position to fill the hole and offer TMD patient's clinical assistance the result of examination should be used by clinicians to create rehabilitation plans that target the impairments unique to each patient.¹³ Joint and soft tissue mobilization, frictional massage therapeutic, patient's education modalities, and external referral are some of the elements of the plan of care that may be suitable.⁸ The case highlights the value of all encompassing strategy in the treatment of this intricate illness to achieve most favorable results.²⁶ Temporomandibular dysfunction is believed to be linked to overall body imbalance. When disturbances like increased muscle tension occurs in the upper body, a compensatory adjustment also affects the muscle tension in the spinal region to maintain proper posture. The adaptation happens within body's capacity to compensate for these changes are exceeded, imbalance occurs and symptoms appear. Each person has unique threshold for compensation, beyond which symptoms emerged. Therefore, addressing neckband shoulder dysfunction alongside TMD treatment is crucial when these issues are identified.²⁴

CONCLUSION

This case report highlights the potential benefits of a conservative physiotherapy management approach for individuals suffering from TMJ dysfunction, emphasizing pain management alongside muscle strengthening and techniques for releasing trigger points and tightness in the affected muscles. Future research should explore the effectiveness of these strategies across diverse populations, including variations in age, gender, and comorbid conditions. Additionally, investigating the long-term outcomes of such interventions could provide deeper insights into their efficacy. Potential applications may also extend to integrating these management strategies into multidisciplinary treatment plans, enhancing the overall quality of care for patients with TMJ disorders

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