

Physiotherapy Management of Chronic Temporomandibular Joint Dysfunction in a Cricket Player: A Case Report

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Abstract:

➤ Background:

Temporomandibular dysfunction (TMJ) is a commonly seen maxillofacial disorder in athletes, with a predominance in females. Contact sports are a contributing factor to TMJ dysfunction, such as blows to the jaw. In recent years, physiotherapy has had excellent outcomes.

➤ Case Presentation:

A 19-year-old male cricket player came in with a complaint of limited jaw opening and a click on jaw movements after suffering a blow to the jaw. Based on clinical examination, he was diagnosed with Internal derangement syndrome. He was treated with joint mobilization, soft tissue manipulation, controlled motion techniques and postural correction for 12 weeks. Range of motion using a ruler, NRS, palpatory assessment and Jaw Functional Limitation scale - 20 were taken at baseline, at 6 weeks and at 12 weeks.

➤ Outcomes:

NRS and Range of motion improved at 6 weeks and 12 weeks after 30 sessions. On palpatory assessment, at 12 weeks click on opening was significantly reduced to only end range of motion. JFLS - 20 scoring was on the lower side indicating low functional Limitation.

➤ Conclusion:

Physiotherapeutic intervention leads to a good clinical outcome in a case of Chronic Dysfunction due to Trauma in a cricket player.

Keywords: Chronic TMJ Dysfunction, Cricket, Internal Derangement Syndrome, Controlled Motion Technique, Case Report, Rocabado and Kraus.

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I. INTRODUCTION

Temporomandibular dysfunction (TMD), especially in athletes, represents a prevalent challenge within the realm of maxillofacial disorders, exhibiting a notable occurrence, with female to male ratio being 3:1 most likely due to hormonal differences.⁽¹⁾ The data published by the American Dental Association in 1990 stated that TMJ problems due to trauma in contact sports were about 44% to 99% presenting a high risk.⁽²⁾

The temporomandibular joint (TMJ) serves as a pivotal hinge joint connecting the jawbone to the skull. The mandibular bone and the glenoid fossa of the temporalis bone form the articulating surfaces of the TMJ with a biconcave intra-articular disc dividing the joint into upper (discotemporal) and lower (discomandibular) spaces.⁽³⁾ Due to its high incongruent articular surfaces and the presence of fibrocartilage, instead of hyaline cartilage-like other synovial joints, any disruption in its optimal function can manifest in a spectrum of symptoms and complications.

The link between contact sports and TMJ dysfunction is well-established, with the inherent physicality of these activities predisposing athletes to various symptoms. Trauma to the jaw is a common factor in contributing to TMJ dysfunction and can be classified as microtrauma and macrotrauma. Microtrauma is due to internal factors and macrotrauma is due to external factors; direct or indirect. Traumatic incidents, particularly blows to the jaw during contact sports, can lead to a range of injuries affecting the TMJ. These injuries may include misalignment of the joint, muscular strain, or other structural abnormalities that compromise its normal function.⁽²⁾⁽⁴⁾

In recent years, physiotherapy has emerged as a highly promising and effective modality for managing TMJ dysfunction.⁽⁵⁾ Physiotherapeutic interventions for TMD encompass a multifaceted approach, involving a combination of exercises, manual therapy, and educational components to address the root causes and alleviate associated symptoms.⁽⁶⁾⁽⁷⁾

Strengthening exercises form a core component of physiotherapy for TMD, focusing on enhancing the musculature around the jaw to improve joint stability. Stretching exercises are also employed to enhance flexibility and alleviate muscle tension in the jaw region. Manual therapy techniques, administered by skilled physiotherapists, involve hands-on manipulation and mobilization of the jaw joint, surrounding muscles, and adjacent tissues.⁽⁶⁾⁽⁷⁾⁽⁸⁾

Posture correction is another integral aspect of physiotherapy for TMJ dysfunction. Patients are educated on maintaining proper posture during both daily activities and sports participation to mitigate additional stress on the TMJ. Physiotherapists may also employ modalities such as heat or cold packs, ultrasound, and other therapeutic techniques to manage pain and facilitate healing.⁽⁹⁾

II. CASE PRESENTATION

A 19-year-old male cricket player, Playing professionally for 6 years was referred to Physiotherapy OPD for complaints of pain and apprehension during complete mouth opening and on chewing and biting hard textured food and clicks on the right side during jaw movements for 6 months. He had a history of a cricket ball hitting the right side of his face during fielding in a cricket match, 6 months ago and since then has been experiencing symptoms. At the time, no bony lesions were found on investigations and abrasions present were promptly treated. He was put on a course of anti-inflammatory cream and muscle relaxant twice a day for 7 days and was advised to apply a hot pack. No relevant medical, family or psychosocial history.

III. ASSESSMENT

After taking consent, on observation, he presented with an overbite (upper jaw protruding over lower jaw) and forward head with protracted shoulders. On Palpation, he had multiple trigger points on the right Masseter and two on the left Masseter. On examination, he had 8/10 on NRS while

opening his mouth, chewing and biting. On mouth opening, his right jaw snapped after initial translation, in the initial Range of motion and his jaw deviated to the left while opening. Clicks were present bilaterally; right more than left. The jaw opening was 1.5 cm.(FIGURE 1) The joint play was Hypomobile. All TMJ provocation tests, static muscle contraction test, and dynamic muscle contraction test, bilateral loading via clench, and unilateral loading via clench were positive with an NRS of 7/10. Jaw Functional Limitation scale - 20 was 4 out of 10. As per the above assessment, he was diagnosed with Internal Derangement Syndrome.⁽¹⁰⁾



Fig 1: At Baseline

IV. TREATMENT

The patient received the following treatment for the next 12 weeks. Ultrasound was given on the right side, continuous mode using a water glove for 5 sessions for 8 mins every alternate day.⁽¹¹⁾ Myofascial release to bilateral masseters was given after 5 sessions of Ultrasound. Joint Mobilization techniques in the form of Mobilization with Movement with Anterior Glide, Medial/lateral glide, and Caudal-anterior-medial glide were given along with facilitating available Range of Motion. Resisted isometrics to depression to control the snapping motion and also to strengthen the muscles.⁽⁸⁾ After 6 weeks, while opening, the left jaw was given a right-directed force to direct the translations with controlled motion exercises given the asymmetry in jaw opening. Controlled motion exercises along with multiple angle isometrics, for the opening and closing while giving slight resistance to facilitate movement were administered. Postural correction exercises in the form of chin tucks, cervical isometrics, scapular strengthening, cervical stretching and shoulder stretching and thoracic mobility exercises were also given.



Fig 2: At 12 Weeks

Table 1. Assessment at Baseline, at 6 Weeks and at 12 Weeks of the Timeline.

Assessment	At baseline	At 6 weeks	At 12 week
Trigger Points	On masseter Right 5 Left 2	On masseter Right 2	No
Pain on opening (NRS)	8/10	4/10	1/10
Snapping during movement	Initial Range of motion	Middle range and reduced	At the end range
Jaw asymmetry during movement	Deviations towards left	Deviations towards left but small	Deviation very minimal and rare
Jaw opening	1.5 cm	2.8 cm	4.1 cm
Jaw Provocation tests	All Positive NRS 7/10	Static muscle contraction test, dynamic muscle contraction test, and unilateral loading via clench positive NRS-3/10	Only Dynamic Contraction test Positive NRS- 1/10
Jaw Functional Limitation – 20 Scale	4/10	2.5/10	0.25/10

NRS: Numerical Rating Scale.

V. RESULT

After 12 weeks, NRS was 1/10, which was a stretch pain. The Jaw opening was 4.1 cm (FIGURE 2) and two full fingers could be placed. Very Mild difficulty with eating Hard food and snapping of the jaw with movement was absent. Significant reduction in clicks was observed. All provocation tests were negative. Jaw functional Limitation Scale 20 was 0.25 out of 10. The assessment at different timelines is depicted in TABLE 1.

VI. DISCUSSION

Temporomandibular Joint Dysfunction due to Trauma in Cricket players is less known and seldom reported, although Cricket has a high prevalence for oral maxillofacial trauma, TMJ dysfunction is still rare. An observational study done by Crincoli V, et. al.⁽⁴⁾ explored different contact sports and its effect on TMJ dysfunction. They compared different symptoms in sports such as rugby, American football, boxing, and basketball and concluded that there is a high prevalence among contact sports, especially American football and rugby. A literature review carried out by Freiwald HC, et. al.⁽¹²⁾ found a high prevalence of TMJ dysfunction in boxers and wrestlers, which is known to have a high incidence of trauma.⁽¹³⁾ In such sports, including Cricket, a blow to the face or the jaw by an external force causes multiple injuries to ligaments, articular surface, or the muscles. These types of injury need to be managed properly at the time or prevented to avoid leading to Dysfunction. Mouthguards are one of the simplest ways such dysfunctions can be prevented.⁽¹⁴⁾

Internal Derangement Syndrome is described as an anatomical disturbance in the relationship between disc and condyle complex. Out of the possible two types of syndrome, this patient falls under disk displacement with reduction

caused by trauma due to ball hitting one side of the face.⁽¹⁰⁾ It caused a displacement of the disc and while active movements of the jaw were performed, the disc tended to displace and pop back into proper position through the range of motion producing clicking and snapping noise.⁽⁷⁾⁽¹⁵⁾ The trauma also caused spasms which eventually led to Myofascial triggers and adhesions within the joint, adding to the symptoms.

Physiotherapeutic intervention in Traumatic TMJ dysfunction in a cricket player showed good improvement at the end of 30 sessions, with Myofascial Release, Joint Manipulation, Control Motion Exercises and Postural corrections exercises.⁽¹⁶⁾ Evidence suggests that joint Manipulation Techniques, and Myofascial release for TMJ help relieve muscle spasms, inhibit pain and improve range of motion.⁽⁸⁾ Control motion exercises retrain not only the correct kinetics but also help in correct gliding between disc-condyle complex. A combination of the Rocabado 6×6 program and the Kraus program was applied.⁽⁸⁾ Ultrasound for TMJ has been shown to promote articular cartilage proliferation to repair cartilage defects and inhibit the secretion of inflammatory cytokines which helps decrease pain and inflammation around the joint.⁽¹¹⁾

Many studies have been conducted that explored the relationship between the cervical spine and TMJ dysfunction, in particular forward head and TMJ.⁽⁹⁾⁽¹⁷⁾ Although not exhaustingly explored, there is a direct relationship between cervical spine and TMJ and hence postural correction exercises play an important role in correcting TMJ dysfunction. In some research articles, it has been suggested that the effect of excessive forward head on the head's center of gravity leads to TMJ dysfunction via the position of the mandible in the temporomandibular joint as well as altering the cervical spine kinematics and kinetics as the length-

tension relationship changes with a forward head that affects the masticatory muscles.

The patient reported that After 12 weeks of physiotherapy, significant improvements were experienced in pain reduction, jaw movement, and overall comfort. Activities such as chewing, speaking, and yawning were made easier, while the fear of jaw locking was minimized. Confidence in athletic performance was restored, and tools for stress management and symptom control were learned. Sleep quality and emotional well-being were also noticeably improved.

Furthermore, our experience highlights the significance of early detection and intervention in preventing chronic TMJ issues from impairing athletic performance. By implementing proactive screening protocols and providing education on injury prevention and self-management strategies, we can mitigate the risk of TMJ dysfunction and promote long-term musculoskeletal health among athletes.

VII. CONCLUSION

The management of chronic temporomandibular joint (TMJ) issues in athletes, particularly cricket players, presents unique challenges due to the demands of the sport and the potential impact on performance. In this case, our intervention yielded positive outcomes, demonstrating the effectiveness of a comprehensive approach in addressing TMJ dysfunction in athletes.

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