CASE REPORT

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Temporomandibular Joint Internal Derangement: A Case Report and Literature Review

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ABSTRACT

This case report presents a patient with temporomandibular joint dysfunction, focusing on radiological, and clinical findings that contributed to the diagnosis and treatment plan. The use of imaging modalities played a significant role in understanding the underlying pathology and guiding the management of patients.

Keywords: Temporomandibular joint, TMJ internal derangement, magnetic resonance imaging, TMJ internal derangement management

INTRODUCTION

The temporomandibular joint (TMJ) is a ginglymoarthrodial synovial joint that allows both backward and forward translation and gliding motion. The articular surfaces of the TMJ are formed inferiorly by the mandibular condyle and superiorly by the glenoid fossa (also known as mandibular fossa) and the articular eminence of the temporal bone. What makes this joint unique is that its articular surfaces are covered by fibrocartilage instead of hyaline cartilage [1].

The TMJ disk is a biconcave fibrocartilaginous structure that interposes between the mandibular condyle and the articular surface of the temporal bone. This interposition of the disc between the two bony portions of the joint has the important function of preventing joint damage. In addition, the disc facilitates the sliding of the mandibular condyle in relation to the temporal bone during the opening and closing of the mouth [2].

The main cause of temporomandibular joint dysfunction (TMD) is internal derangement of the joint, defined as an abnormal relationship between the articular disk and the mandibular condyle that interferes with the normal biomechanics of the TMJ and can manifest clinically as joint pain, jaw deviation while opening the mouth, or sounds (e.g., clicks) emanating from the joint [3].

CASE PRESENTATION

This case report describes a 42-year-old female patient with TMJ dysfunction, focusing on radiological and dental findings that contributed to the diagnosis and treatment plan. The patient exhibited a range of symptoms, including ear pain, joint discomfort, cervical pain, and bruxism, all of which were found to be associated with TMJ dysfunction. The use of imaging modalities, along with comprehensive dental evaluation, is crucial in understanding the underlying pathology and guiding the management of the patient.

The patient underwent a series of examinations by multiple specialists. ENT analysis revealed vasomotor rhinitis, which could contribute to nasal congestion, further complicating TMJ dysfunction. Increased acid levels, detected through gastroenterological analysis, likely added to the patient's stress levels and could intensify TMJ symptoms. It should also be noted that long-term regurgitation can lead to tooth erosion, reduced tooth height, and subsequently, increased stress on the TMJ. Endocrinological evaluation revealed the presence of Hashimoto syndrome, which may have contributed to overall systemic imbalances affecting the TMJ. Dental assessment revealed that the principles of overbite and overjet had been violated, resulting in limited space for the anterior teeth of the lower jaw. This caused the anterior teeth to break, as the patient complained.

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When we asked the patient to open a mouth, the lower jaw deviated to the left side at 27 mm (Figure 1). The maximum opening deviation disappeared and a painful situation was present on both sides, accompanied by bilateral TMJ clicking.

During intraoral screening, the patient was diagnosed with class 1 malocclusion. During examination, the patient denies any history of direct or indirect trauma in the orofacial area. A postural probe revealed shoulder dystonia, flat foot, and asymmetry in hand position, suggesting potential muscular imbalances and compensatory mechanisms. Palpation revealed tender masseter muscles, trapezius muscles, and the anterior portion of the temporal muscle, indicating possible myofascial pain related to TMJ dysfunction.

Follow our recommendation, the patient underwent TMJ magnetic resonance imaging (MRI) examination to clarify the diagnosis (Figure 2).

Figure 1. When we asked the patient to open her mouth, the lower jaw deviated to the left side at 27 mm. The maximum opening deviation disappeared and a painful situation was present on both sides, accompanied by bilateral TMJ clicking

TMJ MRI revealed findings consistent with bilateral TMJ anterior disk displacement with reduction, no joint effusion, and no visible osteoarthritic changes.

After conducting an MRI examination and a thorough medical history review, the final diagnosis of TMD was established, and treatment was initiated. The therapeutic approach was thoroughly explained to the patient, and a special informed consent form was signed.

Dental treatment involved manual muscle deprogramming, during which supracontacts were identified and reduced, and overactive and spasmodic muscles were relaxed and retained. Because of mouth breathing, the palate was partially adapted, and the jaw was deprogrammed and repositioned. Dietary advice included avoiding hard foods to reduce muscle strain. Cervicogenic headache was managed with analgesics (ibuprofen, 10 mg/kg/day orally, every 8 hours), and she was recommended to maintain a good posture while sitting and standing and refrain from sleeping on her stomach to reduce the strain on the neck muscles and ligaments. The patient was advised to switch the pillow to a softer one and to place a rolled towel under the neck while sleeping. It was recommended to normalize the sleeping routine to regulate the nervous system function and thereby increase the patient's stress resilience (Figure 3).

In addition, an intraoral impression was taken, and an intraoral removable hard occlusal splint was fabricated in the laboratory to help reposition the jaw and alleviate muscle tension. The patient was instructed to wear the splint for a minimum of 12 h daily, particularly during the night.

The patient attended three follow-up appointments over a 1 month period. Deviation was corrected, pain was reduced, and ear noise diminished (Figure 4).

A follow-up MRI examination was recommended 3 months later to assess the progress and effectiveness of the treatment. The use of the repositioning splint resulted in proper jaw alignment, with no evidence of deviation.

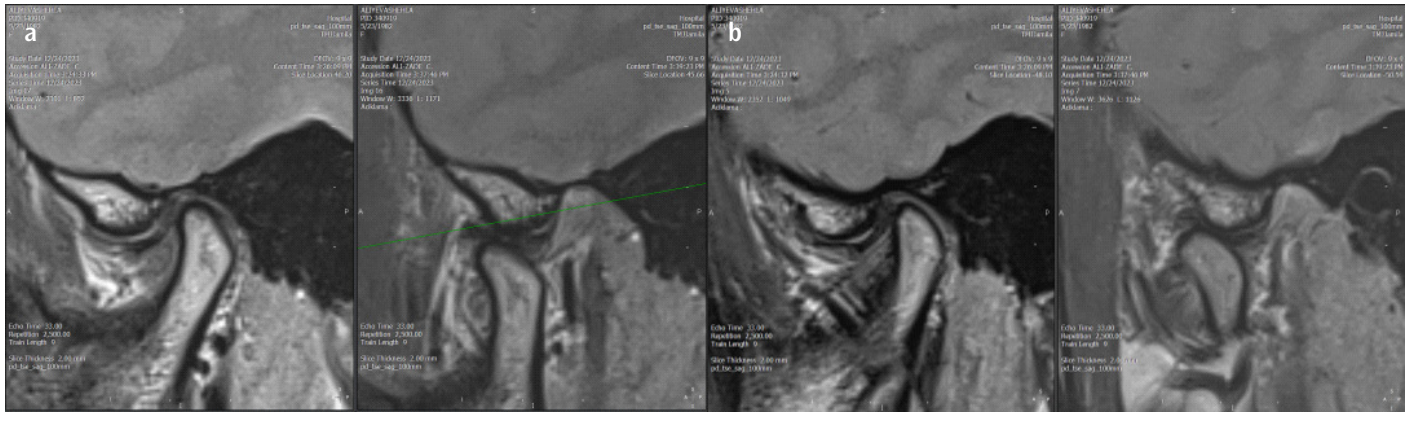

Figure 2. (a) Right TMJ, (b) left TMJ

Figure 3. Occlusal hard splint used as treatment for TMD

Figure 4. (a) Front view of occlusal splint, (b) posttreatment, taken after 3 months of follow-up

DISCUSSION

The TMJ is considered a complex synovial articulation and the most used joint in the human body [4].

TMD encompasses a range of clinical problems such as chronic jaw pain, restricted mandibular movement, clicking or popping sounds during jaw movement, headaches, ear pain or tinnitus, dental issues such as worn or broken teeth, and disruptions in sleep, affecting overall quality of life and well-being.

An exhaustive clinical assessment is imperative, including mandibular range of motion evaluation, TMJ palpation (including ligaments and capsule structures), masticatory musculature (temporalis and masseter) pain under pressure, load testing, and sound detection (clicking, crepitus, and hard-tissue grating) [5].

In conclusion, while clinical examination forms the cornerstone of TMD diagnosis, the role of imaging, particularly MRI, has become increasingly significant in both the diagnosis and management of TMD. This case highlights the importance of timely MRI diagnosis in TMD. It not only confirmed the clinical suspicion but also provided detailed anatomical and pathological information essential for appropriate treatment planning. The correlation between the patient's symptoms and radiological findings further emphasizes the value of MRI as a tool to bridge the clinical-radiological gap in TMD assessment. Moreover, the ability of MRI to detect subtle articular and soft tissue changes in the TMJ underscores its high sensitivity in diagnosing TMD-related pathology.

Ethics

Informed Consent: Informed consent form was signed.

Authorship Contributions

Surgical and Medical Practices: J.A.Z., A.K., Concept: J.A.Z., A.K., Design: J.A.Z., A.K., Data Collection or Processing: J.A.Z., A.K., Analysis or Interpretation: J.A.Z., A.K., Literature Search: J.A.Z., A.K., Writing: J.A.Z., A.K.

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