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Case report

Physiotherapy and occlusal splint treatment in myalgia, cervicogenic headache, and arthralgia: a case report

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Abstract: The purpose of this study was to describe a rare case of myalgia, cervicogenic headache, and arthralgia in which interaction of physiotherapy, relaxation techniques, cognitive and behavioral counseling, psychosocial support, and occlusal splint treatment resulted in a positive outcome. A 27-year-old woman presented to our clinic with myalgia of the right side of the face, right temporomandibular joint arthralgia, right and left temple pain, jaw elevator muscle pain, and head and neck muscle soreness. The right and left joints' magnetic resonance imaging revealed anterior disc displacement without reduction. The treatment strategy aimed for a non-invasive treatment approach to relieve pain and restore functions. An occlusal appliance with an anterior bite plane was selected, along with counseling, psychosocial support, physiotherapy, posture self-control, massage of the head and neck muscles, mouth opening exercises, and self-massage. A temporomandibular specialist oversaw the splint treatment's progress, a maxillofacial surgeon managed the clinical signs and symptoms of the muscles and joints, and a physiotherapist provided the physiotherapy. Muscle stability in the head and neck has been related to temporomandibular disorders and may have repercussions on craniofacial structure and function.

Keywords: physiotherapy; massage; relaxation techniques; oral splint; temporomandibular disorder

1. Introduction

Temporomandibular disorders (TMDs) are a group of musculoskeletal conditions that affect the masticatory muscles, the temporomandibular joint, and the structures of the head and neck [1]. Temporomandibular disorder symptoms affect more than 40% of the population, and their incidence is rising [2]. TMD-related chronic pain may be caused by muscle dysregulation and increased jaw muscle motor load [3]. Cervicogenic headaches have been associated with a forward head posture [4]. The temporomandibular joint position errors after neck protraction-retraction activities involving opposite movements of extension and flexion revealed that upper and lower cervical spine joint position discrepancies may differ [5]. The skeletal morphology should be considered when determining the presence of TMDs [6]. There is no consensus on the effects of TMDs on postural changes; however, it is thought that a disparity in one may affect the other [7]. Craniovertebral flexion movements result in clinical improvements [8]. TMD diagnosis and treatment should be comprehensive because observed differences are frequently influenced by

individual postural deficiencies [9]. Occlusal splints and high-intensity laser therapy are effective treatments for pain and functional jaw movements in patients with disc displacement [10]. Better posture is associated with the use of an occlusal splint [11], and both occlusal splint therapy and exercise therapy are beneficial for patients suffering from painful TMD [12].

There are benefits in terms of pain and dysfunction to combining behavioral education, soft tissue mobilization, and a home exercise program for individuals with a principal problem of myofascial pain associated with a temporomandibular disorder [13]. The literature discusses the relationship between chiropractic and dental treatment for temporomandibular disorder, headaches, and myalgia [14].

The aim of this study was at reporting a rare case of myalgia, cervicogenic headache, and arthralgia in which a combination of physiotherapy, relaxation techniques, cognitive and behavioral counseling, psychosocial support, and occlusal splint treatment resulted in a positive outcome.

2. Case report

A 27-year-old woman with myalgia on the right side of the face, arthralgia in the right temporomandibular joint, right and left temples and pain in the jaw elevator muscles, and head and neck muscle soreness came to our clinic in 2017. She described limited mouth opening. The clinical diagnosis revealed temporalis, masseter, lateral pterygoid, neck, and upper back muscle soreness. The diagnosis of myalgia of the right temporalis, masseter, and lateral pterygoid muscles, pain in the right jaw, temple, and ear, accentuated by jaw opening, was established using clinical diagnostic criteria for temporomandibular disorders [15]. Palpation of the temporalis and masseter muscles, as well as maximum unassisted jaw opening, exacerbated the pain. She furthermore reported referred pain in the neck muscles and the right trapezius muscle. Right arthralgia and right disc displacement with reduction were diagnosed. The joint's inability to tolerate overload resulted in excessive neck bending and the onset of head and neck muscle soreness.

The association between joint and muscle pain, and the referred pain in the neck muscles, along with the forward head posture and inconstant headaches, made this case unique. The clinical examination of this young woman did not allow for the determination of the degree of disc displacement, which was old and allowed for functional adaptation.

The clinical examination could not reach a definitive diagnosis due to the diverse ambiguous clinical signs; therefore, magnetic resonance imaging (MRI) was used to complement it. The right joint MRI revealed an altered disc shape, a thickened posterior band disc, and anterior disc displacement (Figure 1). The articular disc remained anteriorly displaced to the condyle on sagittal MRI of the right temporomandibular joint with an open mouth, indicating disc displacement without reduction (Figure 2).

Throughout a left joint MRI, an anterior disc displacement was found (Figure 3). In the sagittal MRI of the left temporomandibular joint with an open mouth, the ligamentous disc remained anteriorly displaced to the condyle, indicating disc displacement without reduction (Figure 4).

Subluxation of the joint, degenerative joint disease (osteoarthritis, osteoarthrosis), hypomobility disorders (joint ankylosis), myositis, tendinitis, muscle hypertrophy, and movement disorders (dyskinesia or mandible dystonia) were all possible differential diagnoses.

The treatment plan aimed for a non-invasive approach to pain relief and function restoration. When used in conjunction with occlusal splint treatment, relaxation techniques, and physiotherapy (ultrasound) may be effective. Physiotherapy's main goals were to help patients release pain and restore optimal muscle and joint function, as well as head posture. An anterior bite plane occlusal appliance was chosen, along with cognitive and behavioral counseling and psychosocial support. The goal of the appliance was to promote muscle repose, musculoskeletal reprogramming, and muscle relaxation. Mouth opening exercises, self-massage with anti-inflammatory ointments, posture control, and massage of the head and neck muscles were all core components of the

physiotherapy (masseter, temporalis, trapezius, upper back, and neck muscles). After the muscle pain from wearing the appliance had ceased, occlusal adjustments to the anterior bite plate were made. The appliance's adjustment procedures gradually transformed it into a full coverage splint.

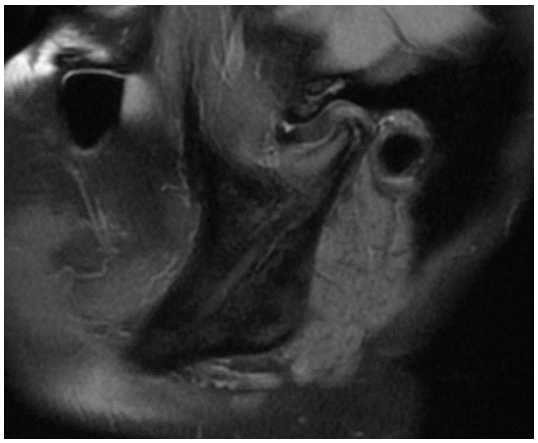

Figure 1. PD MRI of the right temporomandibular joint in the sagittal plane with an altered closed mouth articular disc, thickened posterior band disc shape, and anterior disc position to the mandible condyle.

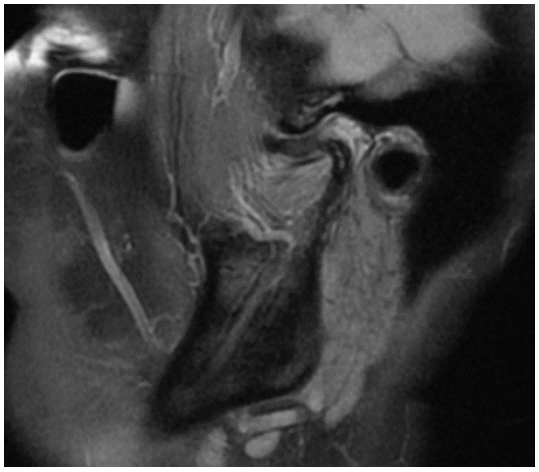

Figure 2. Right temporomandibular joint sagittal image with open mouth PD MRI: the altered articular disc remains anteriorly displaced relative to the condyle: disc displacement without reduction.

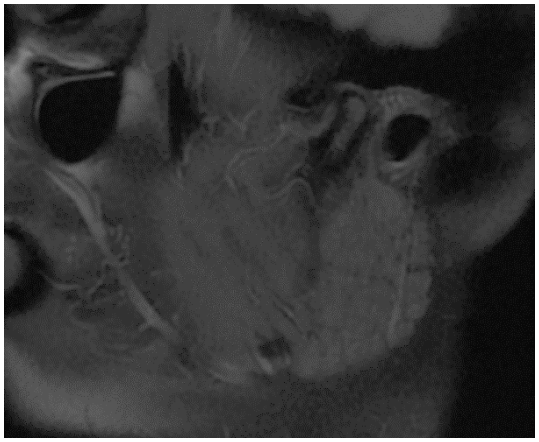

Figure 3. Condensed articular disc with anterior displacement relating to the mandibular condyle on PD MRI of the left temporomandibular joint in the sagittal plane with a closed mouth.

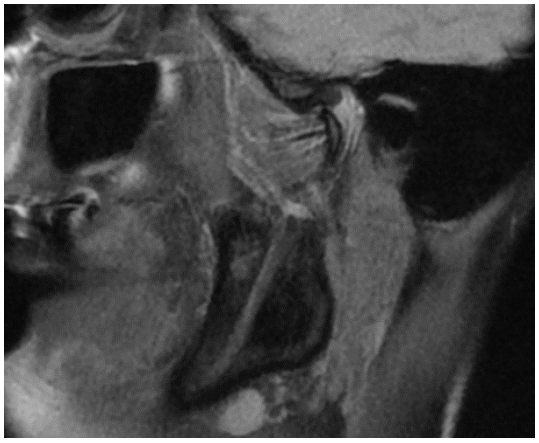

Figure 4. Open mouth PD MRI sagittal image of the left temporomandibular joint: the articular disc remains anteriorly displaced relative to the condyle: disc displacement without reduction.

The patient strictly followed the treatment instructions and reported improvement in symptoms after a week of treatment. Two-week, one-month, and three-month follow-ups all revealed a positive therapeutic efficacy. The patient has been wearing the occlusal appliance for six months, in addition to physiotherapy and self-massage, and has reported an improvement in myalgia and an appropriate mouth opening. After six months, only physiotherapy, relaxation techniques, cognitive and behavioral counseling, and psychosocial support remained as objectives. Five-year follow-up revealed the disappearance of the painful symptoms, and the proper functioning of the jaw and head and neck muscles, indicating a successful outcome. The patient continues to visit our clinic every three months.

3. Discussion

It has been intensively debated if, in patients with temporomandibular disorders, the mandible condyles shift within the glenoid fossae after treatment with occlusal splint therapy and physiotherapy [16]. Derwich et Pawlowska showed that to achieve successful treatment in patients with TMDs, the goal of achieving a centric relationship does not appear to be required. [16]. This was also true in our presented case; the main goal, along with functional jaw rebalancing, was to improve symptoms. As a result, our goal was not to recenter the displaced disc, but rather to regain elevator muscle equilibrium and joint stability, as well as head and neck muscle balance.

As the initial therapy for myogenic TMD, physiotherapy may be preferred over occlusal splint therapy [17].

Although no treatment can be considered superior in terms of pain relief, physical therapy was more effective when it came to reducing the pain intensity [18]. In terms of symptom relief, combined physiotherapy, splint therapy, and education have been described as effective [1].

When considering the occlusal splint as a device for treating a temporomandibular joint disorder, the effects on postural balance are beneficial [19], which we have also highlighted in the reported case.

If left untreated, the temporomandibular disorder may increase in difficulty from a treatment perspective. In such cases, arthrocentesis may be an effective treatment option for temporomandibular disorders, especially in patients with pain and limited mouth opening [20]. As a result, it is recommended that patients be treated as soon as possible, using a combination of treatment modalities, depending on the clinical and paraclinical diagnosis.

The anterior bite plate has been described as providing positive short-term results in the treatment of patients with temporomandibular disorders [21], [22]. A full coverage occlusal splint with an anterior bite plate was initially used to relieve pain and later to support the joint. The anterior bite plane is beneficial for muscle relaxation, but it is

detrimental for disc displacement without reduction because it highly loads the joint. The type of occlusal splint is customized, and treatment sessions aim to adapt the splint to the newly obtained clinical outcome. Obtaining muscle comfort and pain relief indicates a positive effect. To achieve treatment stability and prevent relapse, a stable occlusion is required.

Since pain in the masseter and anterior temporal muscles could impact maximal bite force, a multifaceted combination therapy protocol that includes occlusal splints, patient education, and physiotherapy should be implemented [23]. Counseling and behavioral management of masticatory myofascial pain, combined with an occlusal appliance, have been shown to improve headaches [24].

The involvement of a multidisciplinary team in the treatment of this case was essential. A temporomandibular specialist was able to monitor the splint treatment's progress, a maxillofacial surgeon oversaw the muscle and joint clinical signs and symptoms, and a physiotherapist performed the massage therapy, as well as relaxation techniques, and physiotherapy. It has been stated that physiotherapists should collaborate with dental professionals in the treatment of patients with TMD [25], which we have also emphasized.

Future research should focus on the relationship between vertebral pain, head postural control, and masticatory muscle and joint disorders. More research is highly required to determine the role of physiotherapy, counseling, physiologic therapy, behavioral management, and occlusal splints in masticatory myofascial pain and temporomandibular disorders.

4. Conclusions

Psychotherapy, in conjunction with relaxation techniques, an occlusal splint, and massage, were pivotal for the patient's recovery, aiding in pain relief and increasing mouth opening and overall functioning of the jaw. The muscle balance of the head and neck can influence therapeutic efficacy. The patient became more self-confident and experienced an enhanced life quality. Upper extremity modifications, craniofacial function and structure, and temporomandibular disorders are interconnected.

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