



Case Report

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The Diagnostic Challenges of Pain in Temporomandibular Joints Area



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Abstract

Chronic pain is difficult to manage and detrimental to the patients' quality of life. Temporomandibular joint (TMJ) pain is caused by multiple etiological factors and, in some cases, several factors can be associated. Sometimes, TMJ pain can radiate or be referred in other anatomical regions; thus, setting the diagnosis could be challenging for the medical practitioner. Moreover, the pain originating from various adjacent or remote tissues and organs can be referred to the TMJ area. For this reason, the patients often address to physicians of different specialties and undergo multiple laboratory and imagistic examinations without revealing the real pathology. This article presents the case of a 36-year-old woman with the following symptoms: bilateral chronic pain localized in the TMJ areas radiating to the upper jaw and headache radiating to the cervical spine. She had been examined by several doctors, who referred her for cranial CT scan and MRI, but these examinations showed no signs of pathology. This paper also discusses the diagnostic challenges for the practitioners and the patient's evolution after non-invasive local treatments: low level laser therapy (LLLT) and functional therapy.

Keywords: Chronic pain, Temporomandibular joint, Temporomandibular joint pain, Low level laser therapy

Abbreviations: LLLT: Low Level Laser Therapy; TMJ: Temporo Mandibular Joint; CBCT: Cone Beam Computed Tomography

Introduction

The temporomandibular joint (TMJ) is classified as a ginglymoarthrodial type of joint. It is a complex anatomical structure including the following components: the mandibular fossa and the articular tubercle of the temporal bone, the mandibular condyle, the articular disc, the articular capsule and the lateral pterygoid muscle, involved in the mandible protrusion movement and the closing of the oral cavity. TMJ dysfunction is considered to be one of the major symptom complexes in chronic orofacial pain. TMJ pain is more common in females than males, and there may be an association between the estrogen levels and the TMJ pain intensity [1-4]. It is often difficult to distinguish the TMJ pain from the muscular pain, neurogenic pain [5], articular disc displacement [6,7], migraine and other sources of craniofacial pain; therefore, the clinician must be very thorough when establishing the diagnosis and the treatment plan. There

can be various causative factors for the pain in the TMJ region. The most discussed in literature and the most frequent causes of TMJ pain are the occlusal disharmony and bruxism [8]. Other potential etiologic factors for TMJ pain include: stress, trauma and hyper mobility [9]. It has been proved the direct relationship between stress and the development of bruxism [10-12].

In rare cases, the TMJ or the craniofacial pain can be a hidden warning for a more severe impairment such as prodromal angina or other cardiac conditions [13,14]. In these cases, the pain in the craniofacial area can be easily mistaken as of dental origin, so the clinician should be aware of all these possibilities and make the right therapeutic decision. The treatment plan in TMJ pain is difficult because of the multiple etiological factors and it involves non-invasive and invasive approaches. Occlusal splints [15-17], a non-invasive treatment, proved to be effective

in alleviating TMJ pain and also in decreasing the symptoms of bruxism [18,19]. Low level laser therapy (LLLT) is also a non-invasive, but controversial method for treating TMJ pain. Some studies demonstrated the positive effect of LLLT in TMJ pain [20-23], but others don't recommend LLLT in this condition [24,25]. The aim of this case report is to present the diagnostic challenges and the importance of analyzing all the possible causes of TMJ pain. Moreover, the management of this condition should take into consideration the non-invasive therapies as an adjuvant to other methods of treatment in TMJ pain.

Methods

A 36-year-old female patient was referred to our department complaining of bilateral pain in the TMJ regions (more severe on the left side) radiating to the upper jaw and headache radiating to the cervical spine (pulsatile right hemicranias). Initially, the pain in the TMJ areas was intermittent; then, it became continuous and pulsatile with short periods of pain relief. The pain was radiating to the infraorbital branch of the trigeminal nerve. The medical and dental histories were recorded. The patient was examined and treated in her native country and also abroad where she was working. Patient's written and informed consent was obtained. The patient history revealed that the TMJs pain and headache started three years ago when the patient was referred to an ENT specialist. A cranial CT scan was performed but revealed no evidence of hemorrhage, hematoma or space occupying lesion in the brain; the ventricular system was symmetrical to the midline.

The nasal cavity examination revealed the contact of the posterior septal spine with the lateral wall of the nasal fossa. The patient underwent rhinological surgery and local administration of non-steroidal anti inflammatory therapy. The intensity of the headache decreased and the patient did not follow the other investigations indicated by ENT specialist (neurologic, ophthalmologic and dental examination). After one year, the persistency of the TMJs pain brought the patient to the dental office. The first dentist who examined the patient recorded the occlusal disharmony and the impaction of all third molars. The removal of the impacted molars and wearing an occlusal splint were recommended. Firstly, the upper left impacted third molar was removed. The TMJs pain did not decrease. After a few weeks, the pain on the left side was more intense and the dentist associated the pain to the carious lesion on the left upper first premolar; a disto-occlusal filling was performed. Since the TMJs pain was still persisting, the patient self administered non-steroidal anti inflammatory drugs and eventually lost confidence in the dentist.

The second dentist also recommended the removal of the remaining impacted third molars. The surgeon decided that the TMJs pain was not related to the impacted teeth but to a chronic pulpitis on the left upper first premolar. The patient was referred to the endodontist for the endodontic treatment performed under magnification. Another occlusal splint was performed.

The patient did not wear the occlusal splint because it was uncomfortable during speaking and inconvenient for her job. The TMJs pain persistency determined the patient request for the removal of impacted right upper third molar, performed by the second surgeon (Figure 1). However, the patient experienced no pain release. While the patient was working abroad more than 60 hours a week, the intensity of headache and TMJs pain increased.

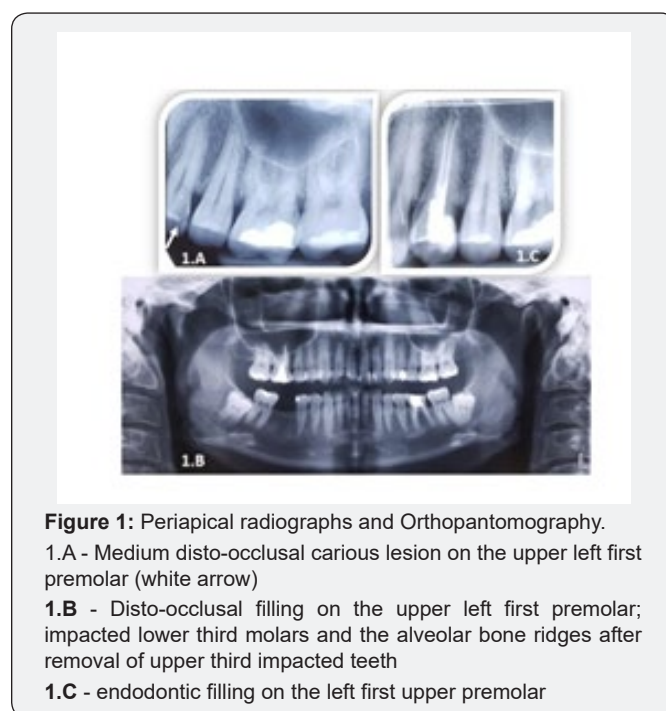


Figure 1: Periapical radiographs and Orthopantomography.
1.A - Medium disto-occlusal carious lesion on the upper left first premolar (white arrow)
1.B - Disto-occlusal filling on the upper left first premolar; impacted lower third molars and the alveolar bone ridges after removal of upper third impacted teeth
1.C - endodontic filling on the left first upper premolar

A general medical practitioner was consulted; he did not notice any changes in the TMJ examined areas and recommended another cranial CT scan. There were no underlying causes for her headache and the symptoms were associated to the migraines and the burnout syndrome. The patient underwent treatment with pain relief and antidepressant drugs. After returning home, the patient consulted a neurologist who established the diagnosis of panic attacks and Arnold neuralgia, and referred her to the psychiatrist. A cranial MRI was performed and revealed no pathological changes. The psychiatrist recommended anxiolytic, hypnotic and sedative drugs. The headache and TMJs pain decreased in intensity for a few months but did not disappear. Another ENT specialist was consulted, and he attributed these symptoms to the chronic TMJ arthritis. She addressed to our department with severe TMJs pain (so intense, that she was weeping of pain) which was irradiated to the head. The pain was not decreased by the pain relief drugs.

The physical examination of the TMJs revealed: menton excursion deviated to the left side during the mouth opening, intermittent jammed movement in mouth closing, pain upon palpation on the left side and crackles on the right side at the end of the mouth closing at the auscultation. No pathological changes were seen in the TMJs on Cone-beam computed tomography

(CBCT) (Figure 2). The orthodontic examination revealed: class 2 normo-divergent skeletal patterns, full class 2 malocclusion on the right side and 3 mm of class 2 on the left side, deep bite and slight anterior crowding (Figure 3). Due to the instable occlusal relationships the patient presents CO-CR discrepancies that could be a high risk factor for her temporomandibular dysfunction (CO-centric occlusion CR-centric relation). The missing lower right first molar also determined the migration of the adjacent teeth and promoted the settlement of the right-side habitual stable occlusion; therefore, the premature contact that induced the CO - CR discrepancy should have been on the left side.

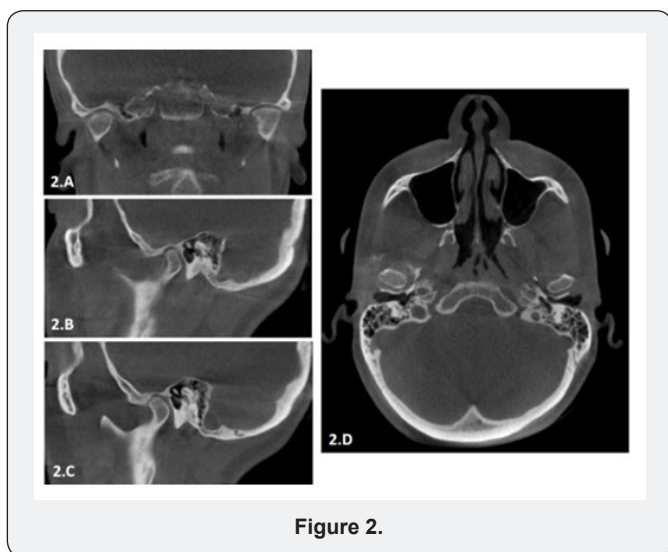


Figure 2.

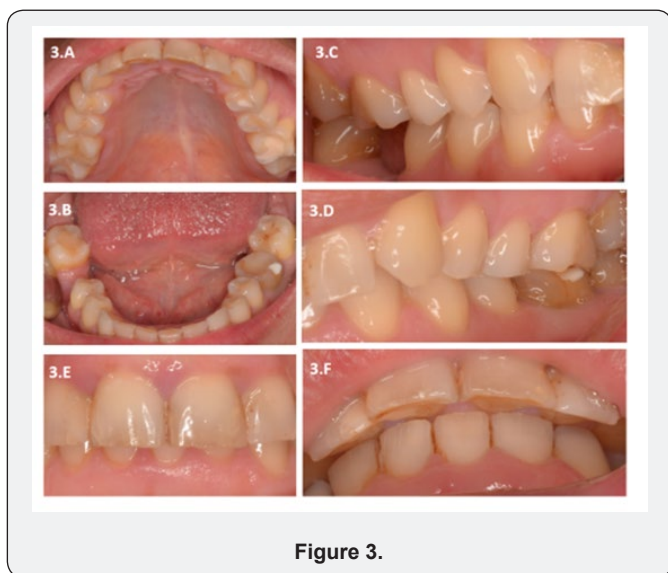


Figure 3.

We established that the patient suffered from algodysfunctional TMJ syndrome related with occlusal disharmony, in the context of stress, anxiety and overworking; additionally, the headache (migraine and Arnold neuralgia) was associated to this condition. We indicated a low level laser therapy (LLLT) and wearing the occlusal splint. At the fourth appointment the old occlusal splint was replaced with a new one and she was advised on how to use it. The patient was informed about the low level

laser therapy (LLLT) and she signed the informed consent form. The pain intensity was measured with a visual analogue scale (VAS) (Figure 4). LLLT was performed using 830 nm BTL-10 with semiconductors (Beauty line, Ltd, Prague, Czech Republic) with a hand piece with convergent emission of radiation. The energy density was 4J/cm², at a frequency of 9Hz and 50mW, for 50 seconds.

Results

The LLLT treatment protocol included bilateral applications on TMJ area, one session per week, for ten weeks. During every session, in order to quantify the pain intensity, the patient marked on a VAS (visual analogue scale) the intensity of the pain before the treatment. The patient was evaluated during seven appointments and the perception of pain intensity decreased continuously (with 6 points after the first session, from 9 to 3, and on fifth and sixth session no pain was reported). On the seventh LLLT session, the patient complained about a low intensity and tolerable pain and she did not attend to the last three LLLT sessions, to finish the recommended treatment protocol (Figure 4). The headache decreased in intensity along with the TMJs pain.

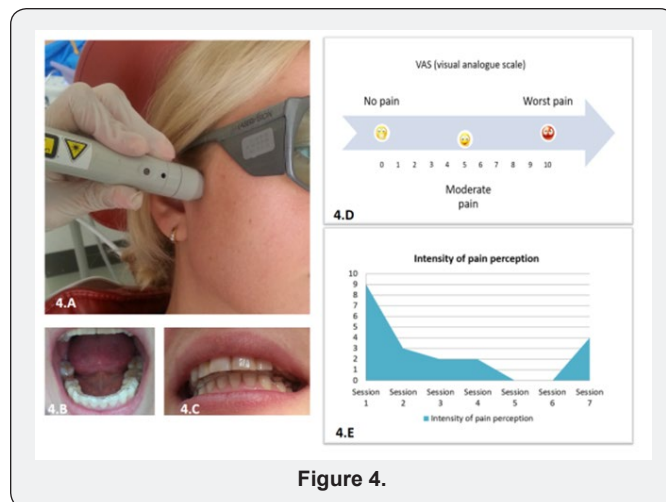


Figure 4.

Discussion

LLLT has an anti-inflammatory and analgesic effect by increasing the local vascularization and lymphatic flow, increasing ATP production and decreasing the prostaglandin E2 and cyclooxygenase-2 levels in the cells [26]. The LLLT treatment proved to be an efficient method for decreasing TMJs pain. Despite the fact that the patient interrupted the treatment, the association between LLLT and the occlusal splint clearly led to positive results, diminishing the TMJs pain during the first LLLT sessions and eliminating it entirely on the fifth and the sixth LLLT sessions. To preserve the results and avoid relapses, occlusal rebalancing is required. Headaches are one of the most common conditions associated with temporomandibular disorder [27]. We considered that the headache also decreased since the patient changed her life style and stopped working 60

hours a week during the treatment, while she was on holidays in her native country.

Furthermore, we noticed an improvement in the patient's mood: she seemed more relaxed and positive than before treatment. When dealing with complex clinical cases, a holistic medical approach should be implemented, and each patient should be considered as an individual case with its own particularities. The patient must also be regarded as a whole organism, not as an assemblage of disconnected anatomical structures which each have their own, isolated pathology. The fact that the patient was working more than 60 hours a week negatively affected the quality of life; this was confirmed by the improvement of her overall mood and the decrease in the headache intensity, after interrupting her hectic daily schedule.

Conclusion

Regardless of all the literature written on this topic, TMJ remains a complex and sometimes enigmatic anatomical structure and while establishing the diagnosis, several etiological factors and various treatment approaches should be taken into consideration. In this case, the association between LLLT treatment and occlusal splint proved to be an efficient method for alleviating TMJs pain.

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