

IMMEDIATE RELIEF OF TMJ CLICKING FOLLOWING LOW LEVEL LASER THERAPY AFTER ORTHODONTIC TREATMENT: - A CASE REPORT.

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ABSTRACT:

Introduction: To determine efficacy of low level laser therapy for clicking temporomandibular joint (TMJ) with a diode laser following orthodontic treatment. **Methods:** Performance of LLLT with a diode laser for temporomandibular clicking and postoperative findings were evaluated in a case of an orthodontic patient following the termination of treatment. Patient had a history of severe clicking before initiation of treatment protocol. Low level diode laser ($\lambda = 905$ nm, power = 0.7 watt, mode = continuous, Time = 60 seconds), applied for the purpose of relieving the signs. **Results:** During the process of intervention and establishing the proper dental occlusion sign of temporomandibular joint dysfunction i.e. clicking reduced significantly ($p < 0.05$) but remained at the lowest level from the perspective of frequency and severity index. Patient had no sign and symptom at the end of treatment. Clicking was reemerged in the retention period, i.e. after six months. Clinical signs disappeared immediately after the application of laser once ($p < 0.05$) with no recurrence after four months follow up. **Conclusion:** Low level laser therapy serves as an adjuvant to orthodontic treatment while establishing the proper occlusion of stomatognathic system has pivotal role in function and stability of outcome.

KEYWORDS: Lasers; Laser Therapy, Low Level; Diode Laser; Temporomandibular Joint Dysfunction Syndrome

INTRODUCTION

Clicking, popping, or snapping in the jaw joint is the most common symptom of Temporomandibular Joint (TMJ). There may or may not be pain in the jaw when the clicking or popping sound is heard. The clicking sound may even be so loud that others can hear it when you chew or speak. Usually the cause of the **popping jaw** is a displaced disc in the jaw. The jaw joints are ball and socket joints, just like the shoulder joint. When ball and socket joints are functioning properly, the ball and socket do not touch because of a thin disc of cartilage located between the ball and socket. This disc of cartilage is held in place and guided by a muscle. If your bite is not right or trauma tears the tissues the jaw joint is pulled out of alignment, and the disc is typically pulled forward or torn. Now that the cartilage disc is not serving as a cushion between the ball and socket these bones are rubbing against each other and pressing on nerves, causing pain in the jaw and clicking or popping sounds in the jaw joint. The muscles holding the disc in place are now strained as well, causing additional pain in the jaw and face as well as in the head, neck, back and shoulders.

Neuromuscular Orthodontics works to **realign the bite**, which also realigns the displaced disc. Once the jaw

is realigned and the disc is back in place the clicking and popping sounds in the jaw stop and the muscles holding the disc in place can relax, alleviating the jaw, face, head, neck, back, and shoulder pain that resulted.

From the etiologic perspective, Temporomandibular dysfunctions are very complicated and a pre-existing condition can be worsened during treatment and retentive phase of orthodontic orthopedic corrections¹. Disorders of TMJ have correlation to several factors including dental occlusion, stress and psychosocial elements; thereby necessitating a multidisciplinary approach for management and assessment². Lateral pterygoid muscle plays an important role in parafunctional, excursive mandibular movement and in specific its superior head is active on ipsilateral and its inferior head on contralateral jaw movement³, hence can influence the TMD problems³⁻⁵. Patients who suffer from TMD and have dentofacial deformities may take advantage of orthognathic surgery in both corrections of skeletal malrelations and improvement in sign and symptoms^{6,7}. Laser with its various types, serves dentistry for the mucosal and hard tissue purposes. Soft tissue dental lasers are known for their precision in surgery, hemostasis in bleeding diatheses, and reduced



Fig.1. Low level Laser Therapy on the Patient



Fig. 2. Low level Laser machine of Quantafrance

healing time. The neodymium YAG laser is used in oral and maxillofacial surgery and exhibits minimal tissue absorption and maximum penetration relative to CO₂ laser⁸. Clinical trials have shown that carpal tunnel syndrome (CTS) can be treated with diode lasers by placing the laser beam directly over the transverse carpal ligament⁹. Low level laser therapy (LLLT) has been promising for success in accelerating wound healing, pain relief and recovery after sport or accident injuries⁽¹⁰⁾. The main purpose of this study was determining the efficacy of low level laser therapy for a patient suffering from temporomandibular joint (TMJ) clicking even after establishing correct occlusal relationship after orthodontic treatment.

Neuromuscular dentists use state-of-the-art technology to determine if your symptoms are caused by malocclusion and if so, what your optimal jaw position is. The dentist uses computerized jaw tracking instruments to record jaw movement, resting position, and path of closure. Electromyography is used to measure your jaw's muscle function in both its stressed and relaxed positions, and will also measure the jaw-to-skull relationship to see if there is a structural imbalance. Sonography is used to record jaw joint sounds to detect any abnormalities. Additionally, x-rays of the jaw may be taken to help evaluate the condition and positioning of the joint.

CASE REPORT

The patient was a 23-year-old Indian female who was complaining about her dental irregularities and

anteroposterior relationship of her jaws. During the intraoral examination, clinical sign of clicking was discovered and history of TMJ clicking confirmed by the patient [Right and Left condyles before treatment (B)](**Table.1**). Clicking was quantified by allocating the numeric field to the proportionate severity i.e. zero allocated for no clicking and mild, moderate, and severe were referred to 1 to 3 respectively. Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 16 by paired t-test between consecutive time periods. The objective sign existed on both sides and recorded as clicking sound during treatment (DT) (**Table 1**). Treatment was based on comprehensive fixed appliance therapy with MBT prescription and 0.022 inch bracket slot. Patient had no sign and symptom at the time of debanding and debonding (A) (**Table.1**).

The functional occlusion was established and the interocclusal relationships lacked any protrusive or lateral excursive interference (**Fig.1**). Regular recall was responded after six months during the retention period and a complete examination of the occlusion and stomatognathic system was performed and evidence of clicking in TMJ was recovered (Ret) (**Table.1**). In the before mentioned session a protocol of TMJ therapy rendered with low level laser therapy ($\lambda = 905$ nm, power = 0.7 watt, mode = continuous, Time = 60 seconds) in diode laser group (Physio Quanta France). Astonishingly, the sign and symptom disappeared immediately after performing the protocol and did not recurrent in a four months follow up (Laser group in **Table.1**).

Discussion

According to the stomatognathic studies, the prevalence of occlusal and RCP (CR)-ICP(CO) discrepancies is as high as 18% in treated cases with fixed appliances¹¹. Non-working side contact occurs in 30% of subjects, and posterior contacts on protrusion in 20% of cases¹². These data clarify that a meticulous examination of occlusal relationship is mandatory before initiation of the debond process for a given patient. Clark has shown if a high degree of jaw function interference is present then the prognosis of improvement with brief self directed physical therapy, an occlusal appliance, and over the counter Non-steroidal Anti inflammatory Drugs (OTC NSAID) are lower¹³. In the present study, as mentioned earlier the amount of occlusal discrepancy was diminished to its lowest degree by the establishment of an acceptable functional occlusion. Recurrence of clicking during the orthodontic retention period after active phase, demonstrate the importance of the follow-up session that cannot be granted.

By application of low level laser (TMJ therapy protocol), clicking sound was ceased and TMJ relief obtained. The

Table.I. Distribution of clicking severity over the period of time (Before, During Treatment, After, Retention Phase, and Laser session) and Right/Left sides.

	Right (B)	Left (B)	Right (D T)	Left (DT)	Right (A)	Left (A)	Right (Ret)	Left (Ret)	Right (Laser)	Left (Laser)
Average	2.5	2.6	1.4	1.5	0	0	1.3	1.2	0	0
SD	0.53	0.52	0.51	0.52	0	0	0.42	0.48	0	0

latter is consistent with other studies for TMJ therapies including the study performed by Fikackova et al for treating arthralgia of the TMJ. They showed the effectiveness of complex non-invasive treatment in patients with arthralgia of the TMJ and the analgesic and anti-inflammatory effects of LLLT which was confirmed by infrared thermography¹⁴. Hence the therapeutic effect of diode laser on TMJ can be conferred through its photodynamic effects, alteration in blood flow, and mechanisms for reducing the inflammatory response of body in TMJ against environmental factors.

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