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*You will be met with an exceptional program covering different topics, from basic research areas to areas within daily practice of Restorative Dentistry, Endodontics, Prosthodontics, Oral Surgery and Implantology, Periodontology, Pediatric and Preventive Dentistry.*

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# TMJ DYSFUNCTION MANAGEMENT USING OCCLUSAL SPLINT THERAPY

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**Abstract:** *Dysfunction of temporomandibular joint (TMJ) represent a condition affecting the temporomandibular joints and surrounding muscles and ligaments. Occlusal splints represent the first line in the strategy of orthodontic treatment of these patients. The aim of our case report is to show the effectiveness of directive, non-permissive splint use as an intermediate treatment, before starting fixed orthodontic therapy in TMD patients. A careful and comprehensive approach with a combination of treatment procedures is needed for successfully reducing the symptoms of TMJ dysfunction before applying fixed orthodontic therapy in order to bring the teeth in ideal position according to all gnathological principles.*

**Key words:** *TMJ dysfunction, occlusal splint, fixed orthodontic treatment.*

## **Introduction**

Dysfunction of temporomandibular joint (TMJ) represent a condition affecting the temporomandibular joints and surrounding muscles and ligaments. These conditions can cause jaw pain, headaches and difficulty in mandibular movements, restrictive opening of the mouth, crepitations, myofunctional pain, hypermobility of the joint, etc. These conditions may affect any age group of patients and a thorough diagnosis is required to differentiate it from other cranial and facial pain conditions, such as tension type headaches and migraines. There are various therapeutic procedures for managing these patients. Occlusal splints represent the first line in the strategy of orthodontic treatment of these patients. Once the cause of occlusal-related disorders is identified, a careful medical/dental history along with a comprehensive examination of each part of the system, such as joints, muscles, periodontium is necessary. Occlusal disturbances, such as persisting slide between Centric Relation (CR) and Maximum Intercuspitation (MIP), balancing, working side and posterior protrusive interferences lead to orthopaedic instability of TMJ and hyperactivity of the muscles of mastication which eventually lead into dysfunction of TMJ, due to the strong correlation between occlusal static and dynamic parameters and dysfunction of TMJ [1-4]. To establish diagnoses of occlusal pathology, however, it is essential to have objective knowledge of the patient's mandibular dynamics and develop a method that enables the dentist to analyze the functional aspects of occlusion [5-8]. Digital analysis provides additional information on occlusal contact pattern, including the quantification of force, sequence of contact and occlusal-disocclusal timing [9-11]. Occlusal splints as a common treatment modality to manage jaw dysfunction have been used for more than a hundred years. There is general agreement that splints protect against tooth wear and damage caused by involuntary clenching or grinding, relieving the strain and stress on masticatory muscles and temporomandibular joint, protecting the temporomandibular joint discs from dysfunctional stresses that can result in perforations or permanent displacements. Occlusal splints prevent patients from achieving maximum intercuspitation. Therefore, the patient must position his jaw properly with stops of equal intensity on all teeth, which facilitates the seating of the condyle in centric relation. Treatment of occlusal-related disorders is often a challenge for both the dentist and the patient. These disorders are often difficult to diagnose, as the presenting symptoms can be variable. Occlusal splint design and function can be considered an example of art and science of dentistry.

## Aim

To assess the need and use of occlusal splint in patients with dysfunction of TMJ, by repositioning the mandible to a centric occlusion, before starting the orthodontic therapy with fixed appliance.

## Material and method

This case report describes an adult patient with clicking sound and crepitus of TMJ on jaw movements with chief complain of facial asymmetry, history of headache, discomfort and pain in the joint itself that radiates into the [mandible](#), ear and neck. The patient was diagnosed with distocclusion, anterior deep bite, occlusal cant and laterotrusion of the mandible (Fig 1).



**Fig. 1.** Intraoral view of the occlusion.

## Treatment plan and progress

After analysis, we ordered the occlusal splint therapy with non-permissive splint for 9 months and fixed appliances with self-ligating technique for period of 2 years. *A non-permissive splint locked the teeth and mandible in a forward position.* This splint had indentations that limited the movement of the mandible and was made from a processed acrylic resin and fitted over the occlusal and incisal surfaces of the maxillary and mandibular teeth. This precise custom removable dental appliance not only protected the teeth from harmful habits, but it supported the TMJ and the masticatory muscles from overuse, wear and damage and facilitates a mutually protected occlusion (Fig. 2).



**Fig. 2.** Intraoral view of the non-permissive splint.

Ideally, occlusal adjustments should not be done until after a period of successful splint treatment. This patient has worn the splint for 9 months and all the symptoms were resolved. The signs and symptoms that were result of the hyperactivated lateral pterygoid and the displacement of the disk which was pulled anteromedially toward the origin of the muscle disappeared. The normal physiological position of the condyle/disc that occurred wearing the properly balanced occlusal splint resulted in an occlusion associated with relaxed positioning elevator muscles (Fig. 3).



**Fig. 3.** Intraoral view of the occlusion after the use of non-permissive splint, neuromuscular harmony.

Then we prosecuted the therapy with self-ligating braces in both dental arches with desarticulation using stops on the palatal surface of the maxillary central incisors. For mandibular assymetry we used intermaxillary elastics Class II on the right side and Class III on the left side. In order to correct the maxillary midline shift we used mini-implant as a temporary anchorage devise to tract the maxillary dental arch on the right side and open coil spring to open the extraction space for the missing maxillary left molar (Fig. 4).



**Fig. 4.** Intraoral view of the therapy with self-ligating braces in both dental arches.

## Results

At the end we corrected canine and molar relationship in Angle Class I, we achieved satisfying static and dynamic occlusion, achieving good muscular balance (Fig. 5).



**Fig. 5.** Intraoral view of the patient at the end of the therapy.

## Discussion

Dentists and orthodontists at one time or another have been exposed to the gnathological concept of occlusion. Establish a gnathologic finish, including canine protected occlusion, protects patients from temporomandibular dysfunction and orthodontic tooth relapse [12-14]. There are several anecdotal and correlational reports of relationships between TMJ dysfunction signs or symptoms and Angle malocclusions in general. This case report shows that distoocclusion, deep bite with loss of molar as a key of occlusion is cause of signs and symptoms of this dysfunction and is in concordance with several authors that confirm this relationship [15-18]. Since occlusal treatments are typically irreversible and the evidence of their therapeutic or preventive effects on TMJ dysfunction is insufficient, it is recommended that reversible treatment such as self-care, well-designed splints should always be used initially to manage signs and symptoms of this dysfunction. Irreversible occlusal adjustments should never be undertaken in the presence of acute muscle pain or other symptoms of TMJ dysfunction. If a well-balanced stabilization splint is worn and the patient's symptoms resolve, only to return when the splint is 'weaned off', then there might be a logical reason to address the occlusion of the natural teeth, but not without further and detailed occlusal analysis, and only after meticulous planning with articulated plaster casts and with informed and valid consent. This would indicate whether provision of an 'improved' occlusion would benefit the patient's symptoms [19].

## Conclusion

An occlusal splint is custom-made using detailed study models on an instrument called an articulator that simulates the movement of the jaws and it designed to guide the jaw as it moves side-to-side and front-to-back. This again helps to reduce strain on the muscles and prevents the jaw joints from being overloaded, creating increased vertical height, which helps to put the jaw in a more neutral or resting position. Occlusal splints promote muscle relaxation by providing a platform for the teeth that allows equal distribution of tooth contacts, immediate posterior tooth disclusion in all movements (with anterior guidance), and reduced stress on the joint.

## References

- [1] Dawson PE. *Evaluation, Diagnosis and Treatment of Occlusal Problems*. 2nd ed. St Louis, Mo: Mosby; 1989.
- [2] Ramford S, Ash M. *Occlusion*. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1983.
- [3] Zarb GA, Carlsson GE. *Temporomandibular Joint Function and Dysfunction*. Copenhagen, Germany: Munksgaard; 1979:230.
- [4] Okeson JP. Occlusion and functional disorders of the masticatory system. *Dent Clin North Am*. 1995; 39(2):285-300.
- [5] Lipp MJ. Temporomandibular symptoms and occlusion: a review of the literature and the concept. *J Colo Dent Assoc*. 1991; 69(3):18-22.
- [6] A l-Ani Z, Davies S, Sloan P, Gray R. Change in the number of occlusal contacts following splint therapy in patients with a temporomandibular disorder (TMD). *Eur J Prosthodont Restor Dent*. 2008; 16(3):98-103.
- [7] Roth RH. The maintenance system and occlusal dynamics. *Dent Clin North Am* 1976; 20:761-88.
- [8] Roth RH. Temporomandibular pain-dysfunction and occlusal relationship. *Angle Orthod* 1973; 43:136-53.
- [9] Roth RH. Functional occlusion for the orthodontist. II. *J Clin Orthod* 1981; 25:100-23.
- [10] Cordray FE. Centric relation treatment and articulator mountings in orthodontics. *Angle Orthod* 1996; 66:153-8.
- [11] Chiappone RC. A gnathologic approach to orthodontic finishing. *J Clin Orthod* 1975; 9:405-17.
- [12] McNamara JA, Seligman DA, Okeson JA. Occlusion, orthodontic treatment, temporomandibular disorders: a review. *J Orofac Pain* 1995; 9:73-90.
- [13] McLaughlin RP. Malocclusion and the temporomandibular joint—a historical perspective. *Angle Orthod* 1988; 85:185-91.
- [14] Barghi N, Agular T, Martinez C, Woodall WS, Maaskant BA. Prevalence of types of temporomandibular joint clicking in subjects missing posterior teeth. *J Prosthet Dent* 1987; 57:617-20.
- [15] Bush FM. Malocclusion, masticatory muscle, and temporomandibular joint tenderness. *J Dent Res* 1985; 64:129-33.
- [16] Schuyler, CH. Fundamental principles in the correction of occlusal disharmony, natural and artificial. *JADA*, Pp. 1193-1202, July, 1935
- [17] Dawson, PE. *Diagnosis and Treatment of Occlusal Problems*. Ed. 2. St Louis, CV Mosby Co. 1989. Pp. 31.
- [18] Boero RP. The physiology of splint therapy: a literature review. *Angle Orthod*. 1989; 59:165-180.
- [19] Garrido Garcia VC, Garcia Cartagena A, Gonzalez Sequeros O. Evaluation of occlusal contacts during maximum intercuspation using the T-Scan system. *J Oral Rehabil*. 1997 Dec; 24(12):899-903.