SCIENTIFIC ARCHIVES OF DENTAL SCIENCES (ISSN: 2642-1623)

Volume 7 Issue 8 August 2024

Review Article

Influence of Unilateral Chewing on the Development of Temporomandibular Disorders: New Paradigm

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Received: September 01, 2024; **Published:** October 30, 2024

Abstract

The American Academy of Orofacial Pain (AAOP) defines temporomandibular disorders (TMD) as "a generic term that encompasses numerous clinical problems of both the masticatory muscles and the temporomandibular joints and their associated structures, or both. TMD is the main cause of non-dental pain in the orofacial region and its prevalence has been increasing in recent years.

The etiology of temporomandibular disorders (TMD) is considered complex and multifactorial; there is no single cause that triggers TMD. The literature establishes as the main etiological factors of TMD: certain occlusal conditions, trauma, stress, deep pain, and parafunction. However, among the causes of TMD, one of the most controversial is the role that occlusion plays as an initiating, perpetuating and aggravating factor; its participation as an etiological factor becomes debatable.

Due to the multifactorial and complex nature of temporomandibular disorders, we should not limit ourselves to rigid concepts. Until now, most studies have been based on static relationships to determine that there is no relationship between occlusion and TMD. However, the concept of occlusion encompasses: a static area and a dynamic one (mastication). A unilateral altered chewing pattern maintained for long enough could have effects on the development, perpetuation and aggravation of symptoms associated with TMD, such as pain.

It is necessary to redefine the concept of occlusion (static and functional) in order to establish its relationship with temporomandibular disorders; and how these can influence, taking into consideration the complex and multifactorial nature of TMD.

Keywords: *Temporomandibular Disorders; Mastication; Facial Pain; Orthopedic Stability; Orthopedic Instability; Occlusal Stability; Occlusal Instability; Occlusion; Applied Biomechanics*

Introduction

The American Academy of Orofacial Pain (AAOP) defines temporomandibular disorders (TMD) as a set of disorders related to alterations in the structure, function or physiology of the masticatory system involving the temporomandibular joints, masticatory muscles and associated structures [22,27].

Temporomandibular disorders are the most prevalent non-odontogenic chronic pain condition in the orofacial area, and their prevalence has been increasing in recent years [25,27]. TMD have a high impact and deterioration in the quality of life of people who suffer from it [21]; generating functional limitation, chronic pain and biopsychosocial repercussions. Epidemiologically, it has a prevalence that varies between 20 and 70% of the general population [1], being more common in women [21-23].

The etiology of TMD is "complex and multifactorial. Many factors can contribute to the development of TMD" [2,23,24]. These factors can be classified as: predisposing factors (increasing the risk of TMD), initiating factors (causing the onset of TMD) and perpetuating factors (favoring the progression of TMD) [2,21,24] (Table 1).

The aim of this paper is to carry out an updated review on the influence of unilateral mastication on the development of temporomandibular disorders and its relationship with occlusion.

Table 1 multifactorial etiopathology of temporomandibular disorders: groups the main factors that intervene in the appearance

Occlusal Factors and Vertical Dimension	Metabolic, Hormonal and Biochemical Factors	Micro anda Macro Traumas	Genetic and Anatomical-Functional Factors. Ligamentous Hyperlaxity
Growth Disorders and Tumors	Portural and Skeletal Factors	Inflammatory and infectious diseases	Physchological ans sleeo disorders. Parafuntions

Table 1: *Extracted from García., et al. 2007 [26].*

of a TMD, whether it is a predisposing, perpetuating or triggering factor [26].

Temporomandibular disorders: From a biomedical model to a biopsychosocial model

Temporomandibular disorders (TMD) "are complex multisystem disorders for which, unfortunately, traditional endocentric approaches to research and care continue to prevail" [3]. The biopsychosocial model addresses TMD with a multidisciplinary management, considering that its etiology is multi-level and associated with multiple factors.

The famous model of The OPPERA study identified risk factors, signs, symptoms, genetic factors and environmental events that contribute to the development and chronicity of painful Temporomandibular Joint (TMJ) disorders [4] (Figure 1).

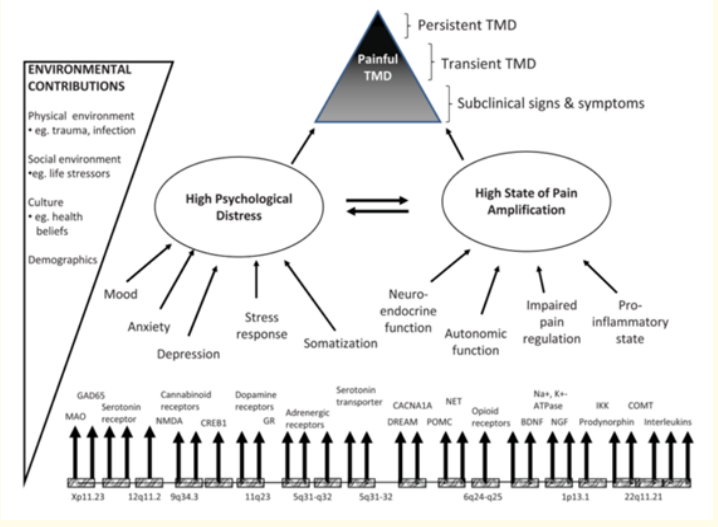

Figure 1: OPPERA study model.

Figure 1 this model shows two main intermediate phenotypes (psychological distress and pain amplification) that contribute to the onset and persistence of TMD. Each phenotype in turn represents more specific risk factors; each of which is subject to genetic regulation. The interaction between the intermediate phenotypes takes place in the presence of environmental factors that may further contribute to the onset and persistence of painful TMD. Time is not shown in the model, because its effects implicitly occur in a third dimension that is not easily shown in the diagram [4].

The results of the OPPERA studies on temporomandibular disorders (TMD) show that TMD is "a complex disorder that must be considered within a biopsychosocial model of the disease" [4]; "it makes no sense to consider a single cause, or even to expect that a single cause may be necessary or sufficient. For most people with chronic TMD, the condition is a multisystem disorder with overlapping comorbidity" [4].

Currently, the need to address TMD from a Biopsychosocial perspective is gaining strength; displacing and leaving behind the old Biomedical model. "A committee appointed by the National Academies of Sciences, Engineering and Medicine of the United States of America summarized important recommendations regarding the urgent need to transform, from the predominantly biomedical model, research, education/professional training and patient care for temporomandibular disorders into the Biopsychosocial model that is standard in the rest of pain medicine" [3]. In this context, it is urgent to "recognize that the Biopsychosocial model of care is essential to understand complex diseases and their treatment" [3].

Temporomandibular disorders and their multifactorial etiology

"The Temporomandibular Joint (TMJ) is an anatomical structure composed mainly of bone, muscle and ligament tissue that performs important movements" [5,24,25]. In addition, "it has fibrocartilaginous tissue in the form of a disk" [5], which divides the joint into two upper and lower compartments" [5,25] "and which has the function of preventing rubbing and/or friction during its movements" [5]. The alteration of the disc can take place both in its histological structure and in its position, according to the author Chih-Ling Chang [6] in his work of 2018 "the etiology of the internal disorder of the disc remains controversial". The alteration or dysfunction of the temporomandibular joint, muscles and other associated structures can give rise to a temporomandibular disorder [24].

The American Academy of Orofacial Pain (AAOP) refers to temporomandibular disorders as "an umbrella term that encompasses numerous clinical problems of either the masticatory muscles or the temporomandibular joints and their associated structures or both. These dysfunctions are the major cause of non-dental pain in the orofacial region and are an increasing problem in recent years" [25].

The literature establishes the main etiological factors in the generation of a TMD: occlusal conditions, trauma, stress, deep pain, and parafunctional activities [7,21]. The etiology of temporomandibular disorders (TMD) is considered complex and multifactorial; there is no single cause that triggers TMD [7,22-24] (Figure 2).

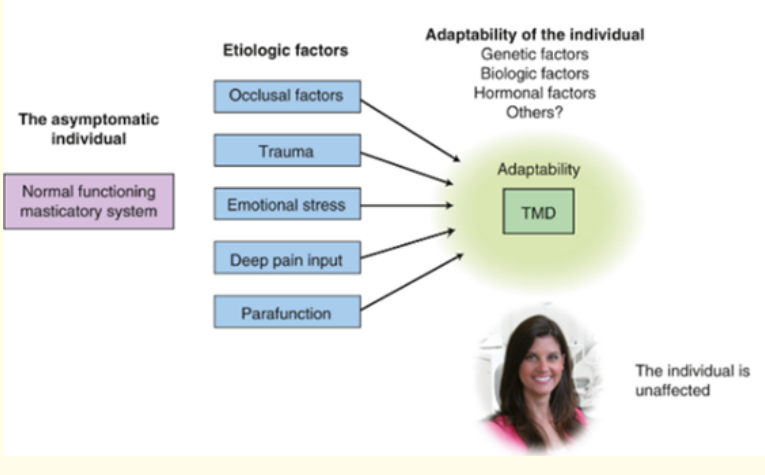

Figure 2: Figure taken from the book treatment of occlusion and temporomandibular conditions. Jeffrey P. Okeson 8th edition. Year 2020.

Figure 2 this model describes the relationship between different factors that are associated with the onset of temporomandibular disorders (TMD). The model starts with a masticatory system that functions normally. It can be seen that there are five main etiological factors that can be related to TMD. The onset and development of a TMD will depend on the patient's adaptability. When the adaptability to these factors is greater than their potential damage, the patient will not have TMD symptoms [7].

Among the causes of TMD, one of the most controversial is the role played by occlusion as a causal factor. The author Mythili Kalladka in his work in 2022 [8] suggests "the role of occlusion as a primary factor in the genesis of temporomandibular disorders is low or very low". However, it is not excluded that temporomandibular disorders can cause changes in dental occlusion [8].

He Author Dr. Montero in his work of 2013, postulates as genesis of TMD "local causes (malocclusions, orthodontic treatments, occlusal disharmonies, parafunctional habits) or general (systemic diseases, emotional stress, sleep disorders, and even genetic factors) [9]", giving greater importance to the occlusal factor, psychological or a combination of both [9,21].

Other authors such as Lekaviciute., *et al*. (2024), indicate "TMJ is caused by a combination of several factors, including biomechanical, neuromuscular, biopsychosocial and neurobiological factors, tooth loss [22], tooth wear, poorly fitting prostheses, caries, inadequate restorations, premature contact of the restorations, inclination of the teeth towards the edentulous space, bruxism [22], onychophagia, hand-jaw support, finger or pacifier sucking, as well as traumatic or degenerative lesions of the TMJ" [10]. In the OPPERA study model, it is emphasized "the predominant effects of oral parafunctions on the incidence of TMD" [4]; as well as its complex and multifactorial nature.

Another work points out as predisposing factors for "the generation of temporomandibular pathology: female gender, bruxism, anxiety and unilateral chewing" [11,21].

Occlusion as a possible etiopathological factor of temporomandibular disorders

To determine how occlusion influences the generation of a TMD, it is first necessary to understand how occlusion influences the orthopedic stability of the system [28].

A stable occlusion "should not cause any problem, if the functional or structural changes occur within physiological limits; the problem arises when there is an unstable masticatory system, which receives load from the elevator muscles, forcing the system to perform movements with modifications of muscular engrams, to achieve greater occlusal stability, leading all this to joint instability" [28]. Once the individual's capacity for adaptation is exceeded (Physiological tolerance), it will give rise to an altered response and consequently to the appearance of symptoms [26,28] (Figure 2).

There are many studies that attempt to classify the different occlusal alterations and disharmonies based on different parameters [26]. Table 2 shows a summary of the three large groups that encompass dysfunctional occlusal pathology and that are related to the balance and correct functioning of the temporomandibular joint [26].

Table 2 occlusion as an etiopathological factor in temporomandibular disorders [26].

Orthopedic instability: As a consequence of interference

"Orthopedic stability exists when the stable intercuspal position of the teeth is in harmony with the stable musculoskeletal position of the condyles in the articular fossae" [16,28] (Figure 3A). Under these conditions, a functional force applied to teeth and joint will not produce lesions. On the other hand, if we have orthopedic instability and there is premature contact, we will have an unstable occlusal position (first dental contact) but with both condyles remaining in a stable articular position (Figure 3B). In this case, the individual must choose between maintaining the stable articular position and occluding only with one tooth or moving the mandible to a more stable occlusal position (with a greater number of contacts), which may compromise joint stability" [16].

Figure 3 taken from the book treatment of occlusion and temporomandibular conditions. Jeffrey P. Okeson 8th edition. Year 2020.

Since occlusal stability is necessary for masticatory functions, it is most likely to be favored by mandibular displacement towards the mandibular side with a greater number of dental contacts. In this way, occlusal stability is achieved: even though the condyles are not in a stable orthopedic position. "The condyles will try to find occlusal stability and these unusual movements can cause tensions in the condyle-disc complex, which could produce an intracapsular disorder" [17] (Figure 3C). Depending on the direction of the man-

Malocclusions	Interference	Functional alteration and vertical dimension
• Class II-1 • Class II-2 • Class III • Anterior open bite • Crossbite	• Protrusive Interference • Interference in work • Interference on balance side • OC- RC discrepancy	• Decrease in dimension • Increse in dimensión • Functional and chewing disorders

Table 2: *Extracted from García., et al. 2007 [26].*

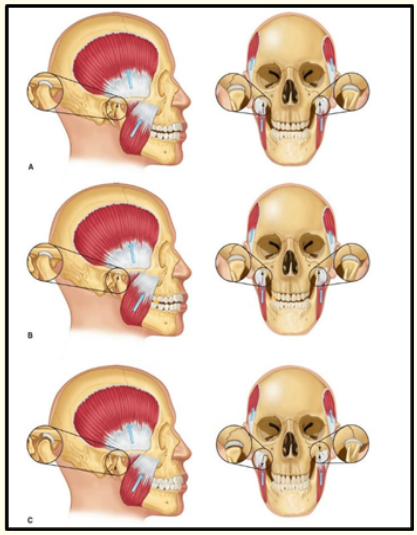

Figure 3: A. With the teeth separated, the elevator muscles hold the condyles in their stable musculoskeletal positions (superoanterior positions with support against the posterior slopes of the articular eminences). In this situation, joint stability exists. B. As the mouth is closed, a single contact does not allow maximum intercuspation of the teeth. At this point, occlusal instability exists, although joint stability remains. Because the condyles and teeth are not in a stable position at the same time, this is considered orthopedic instability. C. To obtain the occlusal stability necessary for functional activities, the mandible is moved forward and the intercuspal position is achieved. At this point, the patient achieves occlusal stability, although the condyles can no longer be orthopedically stable. This orthopedic instability may not be a problem unless unusual loads occur. If a load begins, the condyles will try to find occlusal stability and these unusual movements can cause stresses in the condyle-disc complex, resulting in intracapsular derangement [17].

dibular movement (up or down, protrusive or retrusive sliding), it may generate compression or distension of ligaments, capsule, synovial tissue and muscles; therefore, promoting the generation, chronicity or aggravation of a TMD condition (Table 3).

Orthopedic instability with OC-RC discrepancies

It is important to remember that for the appearance of a TMD (e.g. intracapsular disorder) to occur, there are two factors that must be met: the degree of orthopedic instability and the magnitude of the load.

Type of Interference	Causes	Biomechanics	Clinical consequences
Interference in Protrusive	Ex: A) Molar mesialization due to absence of mesial piece. B) extrusion of antagonist that causes interference in protrusive	Establishes the fulcrum area in the mandible that can cause condylar subluxation on the affected side	Stretching and twisting of ligaments and soft tissues
Interference in Work	Usually in type 1 occlusions, between the lingual slope of the vestibular cusp of the maxillary molars and the vestibular slopes of the buccal cusps of the lower molars.	Horizontal forces	Stretching of ligaments and muscles, condylar displacement due to rotation on the axis of the affected side. Tooth wear
Interference on the non-working or balance side	Usually on the vestibular slopes of lingual cusps in upper molars and lingual slopes of the vestibular cusps of mandibular molars.	Condyle orbits or translates	Closely related to TTM.
Interference in centric occlusion	Dental malpositions, skeletal malformations or dental crowding.	Centric occlusion does not coincide with maximum intercuspation	Microtrauma

Table 3: *Summary of interference types, causes, biomechanical behavior and clinical consequences [26].*

- Orthopedic instability: "Orthopedic instability with a discrepancy of 1 or 2 mm is usually unproblematic. However, if the discrepancy between the musculoskeletally stable position of the condyles and the maximum intercuspation of the teeth increases, the risk of intracapsular disruption will also increase" [16,26].
- Magnitude of load: "Patients who brux with orthopedic instability are more likely to develop TMD than those who present orthopedic instability but without bruxism" [18,26].

Despite all the knowledge that exists, some works insist that "it is not possible to establish an association between the centric relation-intercuspal position discrepancy (CR-ICP discrepancy) and the presence of temporomandibular disorders" [19] and that further research is required with more defined and validated criteria in order to "identify the CR-ICP discrepancy as a possible risk factor for the presence of TMD.

In his work Firmani., *et al*. (2013) indicates that "an altered or unstable occlusion could play a role in the development of temporomandibular disorders (TMD), although the current literature is not conclusive in this regard" [20]. It also states that TMD has "an association with postural and phonoarticular disorders, a lack of aesthetics and even changes in the loads at the plantar level during walking" [20]. Other authors such as Marroquín-Soto., *et al*. (2022) establish an association between "absence of teeth, occlusal support and TMD; reaching the conclusion that the loss of occlusal support on one or both sides of the dental arch due to the lack of posterior teeth are risk factors for TMD [22].

Until now, most studies claiming that there is "a poor relationship between occlusal factors and TMD, have conducted their analyses based on static relationships" [16,20]; that is, based on concepts of "static occlusion" and excluding dynamic and functional function [16].

Therefore, these results could be biased and lead to limited or erroneous conclusions in this regard [16]. There are few studies that relate unilateral occlusion and mastication based on TMD, which could be an important field of research to correlate occlusion in a more functional way with the mechanisms of genesis, aggravation and perpetuation of a temporomandibular disorder.

The definition of occlusion covers both the static and dynamic scope of the intermaxillary dental relationship [20] as expressed below:

- Static occlusion: "The static relationship between the cutting or chewing surfaces of the analogous maxillary and mandibular teeth" [20].
- Functional occlusion: "The contacts between the maxillary and mandibular teeth during mastication and swallowing [20].

Occlusion can be defined as the contact between teeth. These contacts can be considered both static, when the teeth contact each other in maximum intercuspation (MIC) at the end of the mandibular closure, and dynamic, that is, when the teeth slide against each other with the mandibular movement" [20].

Understanding the complexity and the impossibility of establishing a single cause for the origin of TMD, "TMJ overload is considered a main etiological factor" [12]. "Some studies have reported that unilateral mastication may be a contributing factor to TMD syndromes" [12], while others insist that there is no correlation [21].

Occlusal instability: Malocclusion and tooth loss

Another risk factor that could be related to temporomandibular disorders is malocclusion. The term "dental malocclusion" refers to the specific relationship of the teeth with each other, but does not necessarily reflect the possible risk factors for the development of functional alterations in the masticatory system, i.e. a TMD" [18]. Thus, as mentioned in the literature, "dental malocclusion does not clearly correlate with TMD" [18], and there may be cases of stable malocclusion; that is, cases that are orthopedically stable and do not pose any risk for the development of a TMD. For this reason, a malocclusion could be considered a risk factor for generating TMD only in cases where there is significant orthopedic instability in the presence of overexposures recharge. However, other authors such as Marroquín-Soto., *et al*. (2022) argue skeletal class II as a predisposing factor to the appearance of TMD due to the reduction of maxillomandibular stability [22]. In the same work, the authors also refer to the impact of poorly adapted prostheses that could influence occlusal instability and affect the TMJ, producing signs of TMD [22].

Roberta Lekaviciute indicates in her work from 2024 "unilateral tooth loss has the potential to decrease the craniocervical angle and increase the deviation of the occlusal plane from the C1-C2 intersection. As a result, it leads to a disruptive posture of C1 and C2, potentially affecting the balance of the biomechanical and physiological development of the TMJ" [10]. In the same work, it is concluded "TMJ-related factors vary according to different classes of malocclusion, emphasizing the influence of malocclusion on temporomandibular joint disorders; the number of quadrants of tooth loss and the frequency of missing teeth contribute to the prevalence and characteristics of TMD; bruxism is associated with TMD symptoms such as myofascial pain, disc displacement, arthralgia, and muscle disorders" [10].

Understanding that occlusion has a static and dynamic nature (chewing) [20] we can understand that "the modification of occlusal characteristics certainly affects muscle function" [21]. However, the presence of premature contact will not produce an increase in bruxism episodes, according to Okeson. Likewise, the elimination of an occlusal interference does not generate a decrease in TMD symptoms; although Okeson points out that in an asymptomatic population it can reduce the risk of developing TMD symptoms.

Functional changes: Unilateral chewing (Biomechanics)

According to Okeson [13], approximately 78% of individuals have a preferred chewing side, which generates predominance of one chewing side alternating with the opposite side that presents less activity. In less common cases, when there is no preferred side, chewing will take a pattern of alternating and bilateral movements. Therefore, bilateral chewing is characterized by a pattern of alternation between the right and left side with or without predominance over one of them.

On the other hand, unilateral mastication corresponds to an altered mastication pattern that is maintained over time. Some authors suggest that unilateral mastication "would be particularly associated with peripheral factors such as: asymmetric tooth loss in the molar and premolar area, muscle or joint pain or removable restorations" [11]. It would also be closely related to premature contacts, iatrogenesis (high restorations) and a learned and repeated mastication pattern.

The importance of unilateral mastication lies in that it "often induces histological changes in the joints" [12], generating a remodeling of the masticatory apparatus and the functional dynamics of the associated structures. "In addition, forced unilateral mastication may provide the mechanisms that lead to sudden intracapsular alterations" [18]. Okeson points out "one-sided mastication results in uneven loads on the TMJs" [13], but "under normal conditions, it is generally not a problem, thanks to the stabilizing effect of the upper lateral pterygoid muscles on the discs" [13]; as long as the system remains in balance.

During unilateral chewing of a hard food, the temporomandibular joints (TMJ) will receive different loads. This is because the

closing force is applied to the food, and not to the joint, becoming a lever. "The mandible acts as a lever on the fulcrum formed by the hard food, causing an increase in intra-articular pressure in the contralateral joint and a sudden decrease in the joint on the same side. This can cause separation of the joint surfaces and lead to dislocation of the ipsilateral joint" [14] (Figure 4).

Figure 4 normal functional movement of the condyle and disc during opening and closing. The disc rotates backward on the condyle as translation out of the fossa occurs. Closing movement is exactly the opposite of opening movement. This is the pressure between the articular surfaces [14].

As in the previous case, Okeson explains that when there is unilateral dental contact, the activity of the elevator muscles will produce a displacement of the mandibular position towards the opposite edentulous side. In this way, the dental contacts act as a fulcrum; generating the application of different joint forces (less force in the right TMJ). Thus, the masticatory force in a context of unstable occlusion will very possibly have a direct impact on the teeth, the temporomandibular joint and associated structures, predisposing the appearance of lesions due to overload [15] (Figure 5).

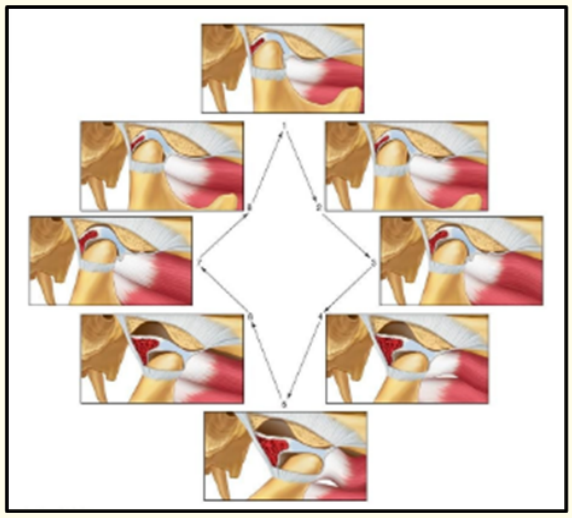

Figure 4: Figure taken from the book treatment of occlusion and temporomandibular conditions. Jeffrey P. Okeson 8th edition. Year 2020.

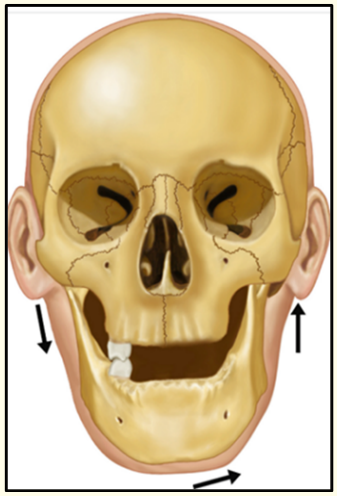

Figure 5: Figure taken from the book treatment of occlusion and temporomandibular conditions. Jeffrey P. Okeson 8th edition. Year 2020.

Figure 5 when there is unilateral occlusal contact, the activity of the elevator muscles tends to pivot the mandible with the dental contacts as a fulcrum or support point. The result is an increase in the temporomandibular joint (TMJ) force on the edentulous (left) side and a decrease in the force applied to the TMJ on the dentate (right) side [15].

Although Okeson presents this situation with reference to a partially edentulous patient, this is applicable to any case where occlusal instability coexists with a pivot or a rocking generated by a support point. Examples of this situation could be premature contacts or interferences, high aesthetic or amalgam restorations, excessive sealants, among others.

The authors Firmani., *et al*. (2013) define interferences as those contacts that produce a deviation from the normal pattern of mandibular movement generating potentially harmful loads for the stomatognathic system [20]. In their work they conclude that most subjects with TMD symptoms present absence of bilateral and symmetrical occlusal contacts [20]. They also postulate that premature contact can affect the electromyographic (EMG) activity of the masticatory muscles; being asymmetrical in all muscles, and greater on the ipsilateral side of the contact. It is also indicated that the presence of non-working contacts has been associated as harmful in the TMJs and the presence of unilateral interference of 0.5 mm increases the EMG activity of the Temporal muscle causing tension headache type symptoms [20].

Unilateral chewing: Causes and generalities

Unilateral mastication will always be carried out on the side with the greatest number of dental contacts and/or the smallest vertical dimension. Therefore, the working side will be the mandibular side that requires the least effort to perform the masticatory function.

A unilateral chewing pattern may be related to personal preferences; or it may be a consequence of tooth loss, pain and occlusal interferences. Likewise, an individual could adopt a unilateral chewing pattern as a consequence of tooth mobility, tooth loss and pain generated by chronic periodontitis.

Hye-Mi Jeon., *et al*. (2017) states in their work "Unilateral chewing due to chronic periodontitis could induce not only pain but also structural changes in the ATM" [12]. It also recommends immediate treatment of chronic periodontitis to prevent not only the primary progression of periodontal disease, but also secondary problems related to TMJ" [12]. And even because of the repercussions of unilateral chewing maintained over time, it urges "subjects who have suffered from chronic periodontitis prolonged without treatment to undergo an examination of the TMJ" [12].

Although it cannot be determined that unilateral mastication has a direct cause in the etiology of TMD, evidence indicates that it can increase "temporomandibular pathology and symptoms" [11]. In his work Jiménez-Silva., *et al*. (2016) points out that "there is "muscle hyperactivity on the side associated with the unilateral chewing habit" [11] and "the presence of joint pathology such as pain on palpation and ipsilateral disc displacement on the masticatory side". That is, unilateral mastication is associated with greater muscle tone and pain on palpation. In addition, studies have shown that there is a close relationship between interference on the non-working side of the mandible and temporomandibular disorders [26].

Due to the complex and multifactorial nature of TMD, there are multiple factors involved in its genesis and worsening. Static occlusion and dynamic occlusion (chewing) should be analyzed from a functional point of view in order to determine the level of involvement and the relationship that unilateral chewing has with temporomandibular disorders.

Discussion

The literature has identified stress [21,22], genetic factors, hormonal factors [21,22], posture, edentulism [22], overload [22] and comorbidities (apnea, gastroesophageal reflux, bruxism) [21,22] as factors for the generation of TMD. However, it is still unclear how risk factors influence the development, perpetuation and progression of TMD.

Currently and for decades, trauma [22] (macro or micro) has been identified as an etiological factor of temporomandibular disorders [26]. Likewise, its direct relationship and implications on pain and functional alterations are known [26].

For trauma to occur, there must be a support on which the system, by means of an inclined plane or a lever system, can balance and cause damage [15]. Any mechanical alteration that generates an alteration of the balance can generate a structural alteration,

inflammation, pain and overload; the disease will occur if the conditions are favorable for its onset [7]. Therefore, this close relationship between occlusion and overload due to activity could be a consequence of unilateral mastication.

The consequences of unilateral mastication, maintained over time, could have repercussions on the entire balance of the masticatory system and associated structures generated by a functional asymmetry. The constant application of asymmetric loads (functional asymmetry) could cause muscular and joint overload, and in the presence of sufficient force and in conditions in which the individual's capacity for adaptation is exceeded, this would generate destabilization of the entire system, promoting inflammation, structural changes, and pain; that is, the generation of a state of disease [26].

Unilateral mastication can lead to facial asymmetry and remodeling of associated structures; in addition to overload and functional asymmetry. This could create a favorable scenario for the generation and worsening of conditions associated with temporomandibular disorders [16].

To date, most studies that have determined a weak relationship between occlusal factors and TMD have performed the analysis based on static relationships [16,26]. Therefore, these conclusions could have limitations with regard to a functional and dynamic assessment. It is likely that "by investigating the dynamic functional aspects of occlusion, it is possible to understand the risk factors for developing TMD" [18]. To do so, it may be necessary to redefine the concept of occlusion, in order to be able to study its relationship with Temporomandibular Disorders but from a more functional point of view [16].

Due to the high prevalence and impact that TMD has on the quality of life [22] of people who suffer from it, it is especially important to become aware and take action in our work as dentists.

As dental surgeons, we are solely responsible for ensuring, maintaining and restoring the occlusal stability of our patients. We must understand that all the structures that make up the stomatognathic system and the rest of the body are related through anatomy, function and stability. In this way, occlusal instability caused by an interfering contact (high sealant, restoration, crown, implant, etc.) or other causes such as pain and tooth loss, could have repercussions on the entire musculoskeletal system.

It is common knowledge that both the treatment and management of TMD must be multidisciplinary. However, prevention must be considered a fundamental pillar and must be transversal to all dental specialties; even more so when our own treatments can be the cause of a muscular and/or joint pathology.

Finally, dental specialties and the rest of the health team are called upon to carry out collaborative work in order to promote the health and stability of the system to prevent the onset, worsening and perpetuation of pathologies such as Temporomandibular Disorder.

Conclusion

Due to the multifactorial and complex nature of temporomandibular disorders and under the concept of the biopsychosocial model, we should not limit ourselves to rigid and exclusive beliefs. Until now, most studies have been based on static relationships to determine that there is no relationship between occlusion and TMD. However, the concept of occlusion covers a static and a dynamic area (chewing). An altered unilateral chewing pattern maintained for a sufficient time could have effects on the development, perpetuation and aggravation of the symptoms associated with TMD, such as pain.

It is necessary to redefine the concept of occlusion (static and functional) in order to establish its relationship with temporomandibular disorders and how these can influence, taking into consideration the complex and multifactorial nature of TMD.

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