



Orthodontics and temporomandibular disorders: the state of art

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It is increasingly common to receive individuals referred by colleagues in the medical field from various specialties, for treatment of pain and or dysfunction of the Temporomandibular Joint (TMJ) and masticatory muscle, known as Temporomandibular Disorders (TMD). These patients are usually teenagers or young adults, who have some type of skeletal or dental malocclusion, and were already assessed for the possible presence of other disturbances with the potential to cause pain or dysfunction in the orofacial area, such as primary headaches, ear infections or sinusitis, among many others.

When examining the patient, the clinician, not uncommonly, will find a malocclusion, with an indication of orthodontic treatment to correct it. At this moment, a storm of thoughts, doubts and fears starts in the head of the professional. Is indicated the treatment of malocclusion for the relief of signs and symptoms of TMD? Is there some kind of appliance or mechanics that should be avoided for these cases? What is the risk of worsening of symptoms with orthodontic therapy?

The literature on the possible relationship between orthodontic treatment, malocclusion and TMD is saturated with research, using different methods and findings are also confused and not representative of the used methodology. One of the most common interpretation mistakes refers to cross-sectional studies, where the individual is examined only once and, sometimes the co-existence of malocclusion and TMD or a history of orthodontic treatment and TMD is detected. Many could conclude that there is a cause-effect relationship between these variables, which should not be

stated, based on this type of observational research. If present (which is not the most common finding in this type of studies^{1,2}), such a relationship would only be an association, precluding any kind of statement which factor preceded (or caused) the other.

Several other problems are also part of this scenario and keep alive the academic discussion. Many orthodontists would report a marked improvement of TMD symptoms immediately after the installation of braces, which would be the effect of "orthodontic treatment". It has been accepted, however, that much of this improvement is due to the act of creating a "new situation" in the oral cavity. That is, the installation of the appliance (and its activation..) triggers a process of cognition, where the new intra oral situation acts as a "warning" for the patient to abandon the habits of clenching teeth and chew gum, and increase adherence to treatment, increasing the success rate of the same. This mechanism is very similar to those caused initially when an occlusal splint is inserted. As seen so far, the difficulties are enormous in relation to methodology and interpretation of results. This process is due, mainly, to the large number of variables involved in this relationship: the orthodontic patient may present several types of initial malocclusion, different methods are used to detect the presence or absence of TMD, and the possible existence of other contributing factors, since it is well known as a multifactorial entity.

The growing concept of Evidence-Based Dentistry (EBD), however, brought important and useful information about this controversy. Systematic reviews, publications with the highest level of scientific evidence, have shown that there are no

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significant association between orthodontics and TMD^{3,4}. This means that individuals undergoing orthodontic treatment do not have higher or lower risk of developing TMJ and/or masticatory muscles signs and symptoms.

These findings are corroborated by a recent article⁵, which reports a longitudinal follow-up of 20 years, where the main goal was to observe if there was any healthy or masticatory gain from the completion of orthodontic treatment. Initially, in 1981, 1081 children were examined, between 11 and 12 years old, and they were re-evaluated after 3, 8 and 20 years. In the last evaluation, the number of subjects studied dropped to 337 participants, usual and acceptable fact in an observational study of long duration. Authors determined the presence and severity of TMD based on the Helkimo's anamnestic questionnaire, associated with standard physical examination. When indicated, orthodontic treatment was carried out by different private practitioners or at the Cardiff School of Dentistry, Great Britain. Psychological and behavioral aspects were also measured by specific inventories. The TMD prevalence, as expected, increased from 3% at baseline to 17% after 8 years, and decreased to 10%, after 20 years. An important finding was that the completion of orthodontic treatment did not interfere with the values of TMD prevalence or incidence (new cases), in any of the evaluation periods. Moreover, the only factors that were considered as predictive for the presence of TMD in adulthood were female gender and the presence of signs and symptoms of TMD in adolescence. According to the authors, the higher prevalence of TMD in women is due to the hormonal changes, a greater sensitivity to external stimuli and the presence of ligamentar hypermobility.

As state before, the method used in the present research to define TMD (anamnestic questionnaire) does not allow sub-classification of the various different types of the disease (articular accompanied or not by disc displacements, muscular, etc.) This fact can be considered a study limitation, be-

cause some studied variables could have influenced individual structures, unable to be measured by a questionnaire. This fact, however, does not interfere with the quality of research or data interpretation, performed adequately by accurate statistical analysis.

The fact of the presence of TMD in the adolescence predict the disease in adulthood alerts us to the need of managing symptoms effectively in this population, in order to decrease future risk. The maintenance of symptoms for long periods often leads to peripheral and central neuronal alterations, which may become irreversible. It should be clear, however, that this control of symptoms should be done using non-invasive and reversible strategies.

After reviewing the above facts, it is clear that one should not suggest orthodontic therapy with the aim of preventing or treating signs and symptoms of TMD. On the other hand, it is understood that conscious and well planned orthodontic treatment should not be seen as the "villain" and the main reason for patients to develop TMD in the future.

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