

# Orthodontics as risk factor for temporomandibular disorders: a systematic review

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## Abstract

**Introduction:** The interrelationship between Orthodontics and Temporomandibular Disorders (TMD) has attracted an increasing interest in Dentistry in the last years, becoming subject of discussion and controversy. In a recent past, occlusion was considered the main etiological factor of TMD and orthodontic treatment a primary therapeutical measure for a physiological reestablishment of the stomatognathic system. Thus, the role of Orthodontics in the prevention, development and treatment of TMD started to be investigated. With the accomplishment of scientific studies with more rigorous and precise methodology, the relationship between orthodontic treatment and TMD could be evaluated and questioned in a context based on scientific evidences. **Objective:** This study, through a systematic literature review had the purpose of analyzing the interrelationship between Orthodontics and TMD, verifying if the orthodontic treatment is a contributing factor for TMD development. **Methods:** Survey in research bases: MEDLINE, Cochrane, EMBASE, Pubmed, Lilacs and BBO, between the years of 1966 and 2009, with focus in randomized clinical trials, longitudinal prospective nonrandomized studies, systematic reviews and meta-analysis. **Results:** After application of the inclusion criteria 18 articles was used, 12 of which were longitudinal prospective nonrandomized studies, four systematic reviews, one randomized clinical trial and one meta-analysis, which evaluated the relationship between orthodontic treatment and TMD. **Conclusions:** According to the literature, the data concludes that orthodontic treatment cannot be considered a contributing factor for the development of Temporomandibular Disorders.

**Keywords:** Temporomandibular joint dysfunction syndrome. Temporomandibular joint disorders. Craniomandibular disorders. Temporomandibular joint. Orthodontics. Dental occlusion.

## Editor's summary

Temporomandibular Disorders awakened the attention of Orthodontists due to the lawsuits showing orthodontic treatment as the development factor for pain in the temporomandibular

joint region. Furthermore, the literature has investigated in detail the influence of occlusal alterations in the etiology of TMD. Current studies, with rigorous methodological criteria and adequate designs, have more precise evidences

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of the interrelationship between Orthodontics and TMD.

This study presented a systematic review about the association between orthodontic treatment and temporomandibular disorders. The sample consisted of 18 studies that met the inclusion criteria adopted. The systematic literature review showed that the prevalence of TMD due to traditional orthodontic treatment is not increased, either with protocols for extractions or not. However, it is necessary to perform further longitudinal, randomized and

interventional studies, with standardized diagnostic criteria for TMD for more accurate causal associations.

It is important to perform, during the diagnostic phase of the pre-orthodontic patients, a full assessment of the presence or absence of signs and symptoms of TMD. Thus, an integration with the Temporomandibular Disorders and Orofacial Pain specialty becomes important for an appropriate treatment decision in the presence of TMD, due to the high prevalence of TMD in the general population.

## Questions to the authors

### 1) Is there a relationship between malocclusion and Temporomandibular Disorders?

Increasingly inserted within a context of an evidence-based Dentistry, occlusion cannot be regarded as a primary etiological factor in the development of TMD. It is recognized that certain occlusal conditions can act as co-factors in the etiology of TMD, but their role cannot be overestimated. Thus, treatments that irreversibly change the occlusal pattern, such as occlusal adjustment and Orthodontics, do not have scientific support as initial treatment protocols for TMD.

### 2) What conduct must be established before beginning orthodontic treatment in a patient with TMD?

Clinical examination of the pre-orthodontic patient should include a complete assessment on signs and symptoms of TMD, making use of complementary examinations when necessary for the correct diagnosis. In the presence of TMD, a therapeutic option should be based on conservative and reversible treatments, and after controlling the signs and symptoms of TMD, proceeding to orthodontic treatment and prosthetic rehabilitation. The awareness of patients with TMD about

this condition is necessary, as well as the importance about the multifactorial nature of the etiology of TMD for adequate management and control of Temporomandibular Disorders.

### 3) Orthodontic treatment should not be indicated in order to alleviate the symptoms of TMD. What is your perception on the diffusion of these evidences among general dentists and Orthodontists?

The initial treatment protocol for TMD should be conservative, reversible, minimally invasive and based on significant scientific evidences. Currently, using evidence-based methods, clinical studies demonstrate that orthodontics does not consist in a form of treatment and prevention for TMD, and when it is properly performed it does not cause TMD development. This knowledge should be discussed and passed on to general dentists and Orthodontists, elucidating this relationship for professionals and patients, since, in some publications, this interface is not entirely clear for professionals.

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