

Functioning of TMJ and Masticatory Ability Get Effectuated Due to Malocclusion and Causes Changes in Orthodontics: A Clinical Review

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ABSTRACT

Background: The most common cause of pain in the face head neck is that of orofacial region and masticatory pain of chronic tendency due to temporomandibular joint (TMJ). The basics of discussion here were to analyses and conclude two things first; orthodontics as a reliever of pain in TMJ disorder, second; TMJ disorder caused due to orthodontic interventions.

Keywords: Malocclusion, Orthodontic.

INTRODUCTION

Genetics and host environment is supposed to be the major cause of malocclusion. It is the one of the common disorder of oro-facial region in all the parts of globe. Traits of malocclusion don't get alters until orthodontic interventions are given.¹

Basically breaking down of food into small pieces, thereby increasing the surface area of food that help in facilitating the enzymatic action on food² and the number of chews in each single input matters the most in initiating the digestive cycle of food.³

Apart from this force used during mastication, presence and absence of tooth's, malocclusion and the contact area of food during the process of

mastication along with the size of the body effects the performance in mastication though there are lots of studies available to analyses the effect on performance of mastication due to malocclusion are in- conclusive. So, there is need to come to conclusion to establish relation between malocclusion and the mastication person in humans.^{4,5}

Effect of malocclusion in masticatory efficiency

From the studies of Lawrence J. Obrey (1936)⁶ it has been discussed that malocclusion cannot be corrected by the correction of functioning of masticatory muscles and correction of malocclusion by orthodontic interventions or prosthodontics corrections.

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R. J. C. Wilding (1993)⁷ bite force and jaw moment affects more on the efficiency of mastication than the contact area of occlusion. Though in individual contact area of occlusion matters but the same is not applicable for different individuals.

Hans pancherz (1978)⁸ showed that the temporal and masseter muscles lessen the activity and lesser the tooth contact in intermaxillary teeth's and effects the mastication process. Activity of muscles and its efficiency effects lesser in overjet relapse cases than the patient without relapse. In relapse cases there is weaker relation of contact area of tooth and its masticatory functioning of tongue will probably be the most suitable expiation.

Jeryl d. English (2002)⁹ assessed ability of subject due to negative ability of malocclusion and breakdown. In another study, authors presented comparison of normal occlusion, depends upon normal malocclusion of 34%, 15% and 9%, in malocclusion of class 1, 2 and 3. There is wider distribution of particles. Performance of mastication and the quality of life patient leads majority depend upon malocclusion apart from this the mutilation of dentition is the additional cause. There is requirement of research in the field of orthodontic therapy and its relation with malocclusion & improvement in masticatory activity.¹⁰

According to Magalhaes (2010)⁵ masticatory performances is decreased by malocclusion there is direct correlation between these two factors, basically it happens due to reduced contact area of occlusal, however improvement of masticatory function with orthognathic surgery can only be appreciated by time span of 5 years.

Suggestion from Ayanakamura (2013)¹¹ concluded that it is quite normal in observation that chewing pattern and mal-occlusion impedes masticatory activity. Bone mineral density of mandible and condylar width reduction easily caused due to mandible mechanical loading significantly

Junginbae (2017)¹² articles suggested that in patient with angle class -1 mal-occlusion is of highest efficiency, which further decreases with class -2 angle occlusion & class -3 occlusion patients in the series. Though there is no significant relation between contact area of occlusion & efficiency of mastication is established.

Influence of malocclusion on TMJ

Costen (1934)¹³ in his review article mentioned that what we now called as Costen's syndrome which includes symptoms such as burning sensation, dizziness, tinnitus, impaired hearing, pain due to unidentified cause. This hypothesis is established by examining 12 patients with anatomical changes in dentition and malocclusion cases.

Ingeregermark (2003)¹⁴ investigations suggested that no direct co-relation can be curtailed between the problem in the TMJ region and the orthodontic therapies given. In case of children having unilateral cross-bite of posterior region with orthodontic treatment needs further investigation and research. T. Henrikson and M. Nilner (2003)¹⁵ to quantify signs of TMD & development of symptoms is difficult to predict. Still there is need of elaborated studies with large sample size and minimum 1 year follow up period.

Micheloti et al (2005)¹⁶ investigated that acute occlusal interfere on habitual effect on muscle performance. The portable EMG recorder put in place to note the activity of masseter muscle at the ipsilateral side. Conclusion reported was that no active response from the subjects under active and little intervention.

Mohlin et al (2007)¹⁷ concluded that no direct co-relation can be curtailed between the problem in the TMJ region and the malocclusion of the subject. Thilader et al (2012)¹⁸ no signs and symptoms of TMD in case of mandibular deviation with a unilateral cross bite in any subject. Padalino g (2016)¹⁹ no direct co-relation can be curtailed between the problem in the TMJ region and the orthodontic therapies

Influence of orthodontic treatment in masticatory efficiency

Franco Mongini (1994)²⁰ concluded that orthodontics act as a reliever of pain in TMJ disorder. William e. Wyatt (1987)²¹ concluded that no orthodontic treatment is given in isolation to TMJ related issues. Fluther (1998)²² review suggested that these orthodontic intervention and TMJ disorders are non-related issue. There is

neither positive nor negative response, rather it is neutral response.

A. Michelotti & G. Iodice (2010)²³ review suggested the favorable prognosis is common in maximum number of patients with TMJ disorders. Requirement of development of comprehensive treatment protocol is the necessity for management of pain and other discomforts including tailored approach according to the subject under consideration for relieving pain and discomfort. There is little proof of temporomandibular disorder due to orthodontic interventions; the orthodontist having different views regarding it. This conclusion was put forward by Faridbourzgui (2010)²⁴. Thais Gonzalez da Silveira Coelho (2015)²⁵ review declares that majority of orthodontists are in affirmative response if they are enquired about TMD caused due to orthodontic treatment, even in the absence of scientific evidence.

Felipe J. Fernandez-Gonzalez (2015)²⁵ suggested that no direct co-relation can be ascertained between the problem in the TMJ region and the orthodontic therapies given. It neither improved nor deteriorated the condition of TMJ related disorders.

CONCLUSION

Due to reduction in occlusion contact area which is one of the major reasons of malocclusion leads to decrease of performance of malocclusion. No sincere correlation is established between the different types of malocclusion & disorder of TMJ is verified. So further studies of long-term nature are needed. Also, in case of children having unilateral cross-bite of posterior region with orthodontic treatment needs further investigation and research.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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