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Research Article

DENTAL OCCLUSION AND ITS ROLE IN THE PATHOGENESIS OF PERIODONTAL DISEASES

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ABSTRACT

occlusion is one of the most controversial factors in determining the etiology of periodontal destruction.Traumatic occlusion,a pathologic state of occlusion,could lead to migration of epithelial cuff,localised bone loss and ultimately increased pocket depth.A series of studies have been conducted to evaluate the interactions between periodontal trauma in relation to the initiation,progression and treatment of periodontal diseases.According to the studies done in squirrel monkeys and beagle dogs where jiggling forces were introduced upon existing marginal periodontitis, the dog models showed increased loss of attachment as well as bone levels as compared to monkey models.The results of various studies conducted so far show that traumatic occlusion on a healthy periodontium leads to an increased tooth mobility but no attachment loss.In inflamed tissues however it resulted in more severe inflammation and ultimately bone loss.After the resolution of inflammation,remaining mobility does not result in increased loss of connective tissue attachment.On a clinical level for periodontal disease treatment,decreased emphasis is placed upon management of mobility and increased emphasis upon resolution of inflammation.

The main aim of this review is to evaluate the effects of traumatic occlusion in the initiation, progression and management of periodontal diseases.

INTRODUCTION

Definition and types of trauma from occlusion

Trauma from occlusion is defined as injury to the supporting structures of the teeth from occlusal forces which exceed the reparative capacity of the attachment apparatus. It is of two types;

Primary occlusal trauma, where the cause of tissue changes in the supporting structures of the teeth are the occlusal forces. Secondary occlusal trauma, where the tissue support to the tooth is compromised. Forces may be normal or abnormal.

Occlusion and Periodontal Destruction-Overview

Among the various risk factors such as age, gender, socioeconomic status, education, ethnicity, smoking, stress, obesity, diabetes, osteoporosis, specific bacteria in subgingival plaque, genetic factors (interleukin-1 genotype) for the progression of periodontal diseas, occlusal discrepancies have also been identified to play an important part[1-3]. For over a century trauma from occlusion has been related with periodontal diseases. An association between traumatic occlusion and periodontal destruction was reported by Karolyi[4] in 1901.Stillman[5] in 1917 and 1926 stated that traumatic forces are the main cause of periodontal destruction and the treatment in form of occlusal therapy should be undertaken for the control of this destruction. However these reports give rise to controversies that continue till this date: what is the relationship between traumatic occlusion in the etiopathogenesis of periodontal destruction?

To evaluate this relationship it is mandatory to review various studies conducted in human autopsies and animal models. Occlusal forces are of significant importance in the etiopathogenesis of periodontal destruction as stated by early authors. However these studies were merely based on clinical observations and were lacking scientific evaluation. Following Stillmans statement, several studies were carried out to evaluate the response of excessive occlusal forces on periodontal lesions. These studies showed that occlusal forces are one of the contributing factors in periodontal destruction. Several researchers have disputed the role of excessive occlusal forces in the initiation and progression of periodontal diseases. In 1933to evaluate the effects of abnormal occlusal forces on periodontal tissues, Orbans and Weinman used human autopsy material. According to the authors occlusal forces do not play a major part in the periodontal destruction, instead the main cause of destruction was the gingival inflammation extending into supporting tissues. During 1950s and 1960s animal researches using rat, dog models were performed[7-9].According

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to these studies, excessive occlusal forces were not the primary etiological agents in periodontal destruction and little or no correlation was found between them. At the same time Glickman and co-workers performed a series of studies using animal as well as human autopsy models. Studies used dog and monkey models in which over contoured restorations were placed to create high occlusal contacts and hence trauma. No relationship between the abnormal occlusal contacts and initiation of periodontal destruction was seen.

A study using rhesus monkeys by the same authors demonstrated a phenomenon known as "altered pathway of destruction". This phenomenon was described as a change in the orientation of gingival and periodontal fibers which predisposes the spreading of gingival inflammation into the periodontal ligament and resulting vertical bony defects.

From various studies it was concluded by Glickman that excessive occlusal forces in presence of gingivitis resulted in a change in periodontal ligament fiber alignment predisposing it for destruction by excessive occlusal forces and the resultant vertical bony defects. Since two distinct factors played a role, the process was termed as a co-destructive effect thus making occlusal adjustment mandatory for the treatment of existing periodontal diseases. Waerhaug[10,11] in his studies demonstrated the relationship between morphology of bony pocket, plaque levels and the presence or absence of excessive forces. According to him, plaque front i.e. the border of sub gingival plaque, always resemble the morphology of bone defect and that the relationship of its level with adjacent teeth will result in either horizontal or vertical interproximal bone loss. According to him it was the down growth of plaque resulting in bone loss and no relationship was present between excessive occlusal forces and bone loss.

Polson and co-workers conducted studies on squirrel monkeys which were subjected to mesial distal compression forces, while Lindhe[12]in his study on beagle dogs subjected them to buccolingual forces. Results of both studies concluded that excessive occlusal forces by themselves don't cause loss of attachment however in presence of bacterial plaque, loss of attachment would occur and by controlling the plaque levels, progression of periodontal lesions can be controlled no matter whether traumatic occlusion was present or absent.

Studies conducted in humans

Human studies are few in number as compared to animal studies and are only descriptive or retrospective in nature. According to the results of various studies[13]Periodontal destruction does not depend on presence or absence of occlusal discrepancies. On contrary some studies report that patients undergoing occlusal adjustment as a part of their periodontal therapy had greater attachment gain then those without treatment. Thus when indicated occlusal adjustment should be performed as a part of periodontal treatment. Teeth with occlusal discrepancies were found to have deeper pocket depths and worse prognosis then those without.[14] Treated groups showed a slow progression of destruction when compared to non treatment groups.

CONCLUSION

Early studies performed to establish a relationship between abnormal occlusal forces and periodontal destruction focused on a cause and effect relationship. According to Stillman increased occlusal forces were the primary cause of periodontal lesions and their eradication should be the main line of treatment. With the increasing concept of the role played by bacterial plaque in the pathogenesis of periodontal lesions, the role of traumatic occlusion appears to be of lesser significance. Thus occlusion plays a role in only specific types of periodontal destruction. According to the Glickman's theory of "co destruction" in combination with bacterial plaque traumatic occlusion results in attachment loss and bone destruction. Thus to conclude bacterial plaque remains the primary etiological agent for the periodontal destruction and the presence of factors like abnormal occlusal forces tend to accentuate this condition. The treatment should be directed towards plaque control followed by the treatment of occlusal derangements and other contributing factors.

References

1. Cronin AJ, Claffey N, Stassen LF. Who is at risk? Periodontal disease risk analysis made accessible for the general dental practitioner. *Br Dent J* 2008; 205:131-137.
2. Van Dyke TE, Sheilesh D. Risk factors for periodontitis. *J Int Acad Periodontol* 2005; 7:3-7.
3. Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. Lancet 2005; 366:1809-1820.
4. Karolyi M. Beobachtungen uber pyorrhea alveolaris. *Ost ung vierteljschr Zahnheilk* 1901:17:279-283.
5. Stillman PR. What is traumatic occlusion and how can it diagnosed and corrected. *J Am Dent Assoc* 1926:12:1330-1338.
6. Box HK. Experimental traumatogenic occlusion in sheep. *Oral Health* 1935:29:9-15.
7. Comar M, Kollar J, Gargiulo A. Local irritation and occlusal trauma as cofactors in periodontal disease process. *J Periodontal* 1969:40:193-200.
8. Macapanpan, Weinman J. The influence of injury to the periodontal membrane on the spread of gingival inflammation.*J Dent Res* 1954:33:263-272.
9. Wentz F, Jarabak J, Orban B. Experimental occlusal trauma initiating cuspal interferances. *J Periodontal* 1958:29:117-127.
10. Waerhaug J. The angular bone defect and its relation to to trauma from occlusion and downgrowth of subgingival plaque. *J. Periodontol* 1979:50:355-365.
11. Waerhaug J. The infrabony pocket and its relation to trauma from occlusion and subgingival plaque. *J. Periodontol* 1979:50:355-365.
12. Ericsson I, Lindhe J.Lack of significance of increased tooth mobility in experimental periodontitis. *J Periodontol* 1984:5:447-452.
13. Jin L,Cao C.Clinical diagonosis of trauma from occlusion and its relation with severity of periodontitis. *J Clin Periodontol* 1992:19:92-97.
14. Harrel SK, Nunn M. The effect of occlusal discrepancies on treated and untreated periodontitis. II. Relationship of occlusal treatment to the progression of periodontal diseases. *J Periodontol* 2001:72:495-505.