

Orthodontic Brackets and their Impact on Periodontal Parameters

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ABSTRACT

Aim: To compare bleeding on probing on teeth bonded with orthodontic brackets with teeth when they are not bonded with brackets.

Material and Method: 10 subject are choosen who are going for orthodontic treatment. Their bleeding on probing is checked just before orthodontic racket placement and score recorded according to Muhlemann index. Patent is checked for probing depth also with UNC 15 probe. Further bleeding scores and probing depth are taken on 3rd and 7th day after the orthodontic bracket placement.

Results: There is significantly increase in bleeding on probing in marginal and papillary gingiva on 7thday while probing depth doesn't show any significant increase in depth.

Conclusions: Brackets have significant impact on gingival inflammation so gingival care needed during orthodontic treatment.

Keywords: Orthodontic brackets, gingival inflammation, periodontal pocket depth, bleeding on probing.

INTRODUCTION

Adverse reactions due to orthodontic treatment with fixed appliances have been described. Besides decalcification, leading to white spots and eventually caries, periodontal harm may occur¹. One of the adverse periodontal reactions is a hyperplastic/ hypertrophic form of gingivitis, which, in our clinic, is estimated to occur in onevout of 10 patients treated with fixed orthodontic appliances.² This reaction might be elicited by a change in microbiological environment.

As the consequences for oral health are uncertain and as periodontal breakdown at young age could eventually put a burden on oral health in

the long term, interruption of the orthodontic treatment is often advised when a hyperplastic/ hypertrophic form of gingivitis is diagnosed. It is well established that bacterial plaque is the primary aetiological cause of gingival inflammation and periodontitis.³ The quantity as well as the quality of plaque, which spontaneously forms after a tooth is thoroughly cleaned and pumiced, is influenced by many factors including surface characteristic.⁴ Especially surface roughness and surface free energy were found to be positively correlated with plaque growth rate.⁵ The presence of gingival inflammation will further increase plaque growth. Besides the total amount of bacteria, also the ratio between the aerobic and anaerobic bacteria is an

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important aetiological factor in the development of gingivitis and periodontitis.⁶

AIM

To compare bleeding on probing on teeth bonded with orthodontic brackets with teeth when they are not bonded with brackets.

OBJECTIVE

To compare the clinical periodontal parameters bonded teeth with control teeth by means of a de novo plaque growth experiment with a duration of 7 days.

MATERIAL AND METHOD

Source of Data: Ten patients was randomly selected from the Goenka Research Institute of Dental Sciences, Ahmedabad.

Inclusion Criteria

- 1) Age between 17 and 27 years.
- 2) patients having chronic gingivitis.

Exclusion criteria:

- 1) Patients who received long term antibiotic or anti-inflammatory therapy.

Method of Collection of Data:

Material: UNC-15 probe

Periodontal parameters:

1. At baseline, on days 3 and on day 7 (before and after plaque disclosing), periodontal parameters will be taken to follow the undisturbed plaque formation. At the same occasions the following parameters will be scored (on day 3 only the first pre-molars and on day 7 the remaining teeth)
2. Periodontal pocket depth (PPD)
3. Bleeding on probing (BOP)]

Bleeding index (Muhlemann in 1979)

Four gingival units was scored systematically for a tooth: the labial and lingual marginal gingiva (M units), and mesial and distal papillary gingiva(P units)

Table 1: Scoring criteria

Score	Criteria
1	Healthy appearance of P and M, No bleeding upon sulcus probing.
2	Apparently healthy P and M showing no colour or contour changes and no swelling, but bleeding from sulcus on probing.
3	Bleeding on probing, change in colour, slight edematous swelling.
4	(1) Bleeding on probing, colour change, obvious swelling. (2) Bleeding on probing and obvious swelling.
5	Spontaneous bleeding on probing, colour change, marked swelling with or without ulceration.

The scores for the four units can be totalled and divided by four to obtain the SBI for the tooth. By totalling scores for individual teeth and number of teeth, SBI is determined. In every student the mouth will be divided into four quadrants, two of which served as controls. For the split-mouth comparison, sites will be defined: the first and second pre-molars and the first molar. The brackets will be placed in contralateral antagonistic quadrants. The teeth bonded with brackets were compared with the non-bonded control sites. On the second visit (on day 3) the brackets will be removed from the first pre-molars and the clinical measurements for these teeth will be repeated. On day 7 the students came for the last clinical measurements, the removal of the last brackets and for a thorough cleaning and polishing of the teeth.

RESULTS

The mean bleeding index increased on P-site and M-site on the 3rd and 7th day. The mean bleeding index on P-site was 1.6 on the 3rd day and 2.1 on the 7th day where as on M-site was 1.72 on 3rd day and 2.22 on 7th day. The mean PPD was 1.9mm on 3rd day and 2.1mm on 7th day. While at baseline mean bleeding index on P-site was 1.1 and M-site was 1.16 and PPD was 1.8mm.

Table 2: Scores at different time intervals and at different sites

	BOP		PPD
	P-site	M-site	
baseline	1.1 (0.2)	1.16 (0.2)	1.8 (0.3)
3rd day	1.6 (0.3)	1.72 (0.3)	1.9 (0.3)
7th day	2.1 (0.2)	2.22 (0.2)	2.1 (0.2)

DISCUSSION

There are significant differences between bonded teeth and non-bonded teeth. Several studies have indicated increased plaque accumulation after orthodontic bracket placement. 7 days have been selected due to assessment of early plaque biofilm. Present studies show that there is linear increase in plaque accumulation hence increase in bleeding on probing. Marginal sites show baseline score of 1.16 (0.2) while on 3rd day and 7th day score was 1.72(0.2) and 2.22 (0.2) respectively. Papillary sites show baseline score of 1.1 (0.2) while on 3rd day 1.6 (0.3) and 7th day 2.1 (0.2) respectively. Probing depth shows baseline depth of 1.8 mm(0.3mm) while on 3rd day and 7th day 1.9mm(0.3mm) and 2.1mm(0.2mm) respectively. Statical analysis shows significant increase in bleeding on probing in marginal and papillary area on 7th day while there is no significant increase in probing depth even after 7th day.

CONCLUSION

This study suggests that after placement of brackets in healthy patient's oral hygiene of patients deteriorates after 3rd and 7th day while no effect on probing depth noted. further microbial analysis

must be conducted in order to establish relationship between orthodontic brackets and gingival inflammation.

CONFLICT OF INTEREST

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

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