



COMPARISON OF DIFFERENT TOOTH BRUSH PROTOCOL TO PREVENT PLAQUE REDUCTION IN FIXED ORTHODONTIC PATIENTS.

Dr Awanindra Kumar Jha

Assistant Professor, Dept. Of Orthodontics and dentofacial Orthopaedics, Dental College, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand

Email-mybraces@yahoo.com

Dr Dhyan Chand Murmu

Dental Surgeon (Medical Officer), Govt. Hospital Bijatala, Rairangpur, Odisha

Email-dhyan001@gmail.com

Corresponding Author and address : Dr Awanindra kumar Jha,

Department Of Orthodontics and Dentofacial Orthopaedics, Dental College, RIMS, Ranchi-834009, Jharkhand, India

Email-mybraces@yahoo.com

Article History: Received: 12.05.2023

Revised: 25.05.2023

Accepted: 05.06.2023

Abstract

Introduction: Maintenance of Oral Hygiene is major concern in patient undergoing fixed Orthodontic patient. In fixed orthodontic appliances Brackets are bonded on the centre of crown and Bands are cemented to molar teeth by the orthodontist. The Rapid Plaque accumulation around Bracket causes increased acid production by oral microbes a causing demineralization of enamel. This study was planned to know the effectiveness of Orthodontic tooth brush along with interdental proxa brush over conventional standard protocol of maintaining oral prophylaxis in fixed orthodontic toothbrush.

Material and Method: A total of 72 patient in the age group of 14-20years, requiring fixed orthodontic treatment were evaluated for three different tooth brushing protocol; Conventional Tooth brush (Group I), Orthodontic Toothbrush along with Interdental Proxa Brush (Group II) and Conventional Tooth brush along with Interdental Proxa Brush (Group III) to understand better oral hygiene and gingival health over a period of 6 months.

Result: A decline in mean plaque score of group II was observed. The mean plaque score in Group II decrease from baseline 1.120 ± 0.33 to 1.015 ± 0.35 after six month ($P < .05$). The intergroup analysis of mean gingivitis score in Group II showed statistically significant decline in the mean gingival score from 1.246 ± 0.32 to 1.075 ± 0.38 Over a period of 6 months ($P < .05$).

Conclusion: There is need of different oral hygiene protocol of patients undergoing fixed orthodontic treatment. The conventional tooth brush is less efficient in cleaning around braces. There is need to understand the role of interdental Proxa brush in fixed orthodontic patients. It can be used along with Orthodontic or conventional tooth brush for good oral hygiene.

Key Words-Orthodontic Tooth brush, Prox brush, Oral Hygiene, Orthodontic patient

Introduction:

Maintenance of Oral Hygiene is major concern in patient undergoing fixed Orthodontic patient. In fixed orthodontic appliances Brackets are bonded on the centre of crown and Bands are cemented to molar teeth by the orthodontist^{1,2}. These appliances will remain fixed for 18 months to 24 months depending on severity of malocclusion³. These fixed attachments are major source of plaque retention in orthodontic patients. The Rapid Plaque accumulation around Bracket causes increased acid production by oral microbes a causing demineralization of enamel^{4,5}. Prolong accumulation of plaque induces inflammation of gingival and increases bleeding from gum⁶.

One of the important aspect of orthodontic treatment is advice patient home based cleaning of oral cavity. There are different oral prophylaxis tool for minimizing accumulation of plaque. Brushing twice a day with fluoridated toothpaste is slandered protocol⁷⁻⁹. Orthodontic toothbrushes are developed with different level of bristles to accommodate bracket¹⁰. Interdental Proxa brushes are also advised to clean around tooth surfaces. Many studies have shown that poor plaque control in fixed orthodontic patient causes gingival inflammation, periodontal disease and Caries. The success of orthodontic treatment depends on maintenance of oral hygiene¹¹⁻¹².

Many clinicians reported patient with poor oral hygiene resulted in severe mucogingival inflammation. Orthodontic appliances itself do not cause gingival inflammation but they can contribute to periodontal disease due to the increase in plaque accumulation¹³. Plaque deposition gives favourable environment for microorganism causing gingival inflammation. It is very important to emphasize importance of oral hygiene care during fixed orthodontic patient¹⁴.

This study was planned to know the effectiveness of Orthodontic tooth brush

along with interdental proxa brush over conventional standard protocol of maintaining oral prophylaxis in fixed orthodontic toothbrush.

Material and Methods:

Seventy two patients requiring fixed orthodontic treatment were selected from OPD patients. Eligible Patients were divided in two groups

Group I (n=24): 14 females and 10 males who were selected given standard toothbrush with uniform soft bristles and advised to brush twice a day with fluoridated toothpaste.

Group II (n=24): 12 females and 12 males who were selected given Orthodontic toothbrush along with Interdental Proxabrush and advised to brush twice a day with fluoridated tooth paste.

Group III (n=24): 15 females and 09 males who were selected given standard toothbrush along with Interdental Proxabrush and advised to brush twice a day with fluoridated tooth paste.

Each and every participants and guardians of both the group were demonstrated how to clean braces on dummy model of dental arches with upper and lower arches with fixed braces. Each participant was given counselling after bonding of Braces by chair side Dental assistant.

Inclusion Criteria were as follows: the patient age should be between 14 to 20 years with minimum 24 permanent teeth erupted in oral cavity. Participants had brushing habit at least once per day.

Exclusion Criteria were as follows:

1. Patient having systematic disease or medically compromised patients.
2. Patients where oral hygiene could be compromised like mentally or physically changed patients, patients having cleft palate.
3. Presence of any active periodontal disease

The clinical examination were then carried out and scores for gingival and Plaque. Plaque was assessed with Plaque Index (PI) as described by Silness and Loe. Gingivitis was measured with Williams periodontal Probe on labial or buccal surface of teeth by using Gingival Index (GI) described by Loe and Silness. First Baseline data was recorded followed by collection of Orthodontic records. The patients were bonded MBT 022 Bracket from Incisor to premolar and Molar Bands cemented with glass ionomer cement on molars. After three and six months of

orthodontic treatment plaque index and Gingival index were recorded. The patients were recalled every month for orthodontic treatment and motivated for good oral hygiene after chair side treatment has been done.

Baseline scores of Plaque Index and Gingival index were compared with scores at 3 month and six month after bonding of orthodontic bracket. The data were calculated for Mean and Standard Deviation measurement. The data were compared using analysis of Variance (ANOVA) and Chi-square test.

Table1. Mean Plaque Scores among the group

Groups	Baseline	3 Month	6 Month
Group I	1.105+0.32	1.045+0.35	1.072+0.28
Group II	1.120+0.33	0.925+0.37	1.015+0.35
Group III	1.134+0.42	0.954+0.27	1.021+0.32
Total	1.112+0.36	0.974+0.33	1.036+0.31

Result:

The Mean scores of Plaque for all the three groups are presented with standard Deviation in Table 1. The plaque accumulation is minimum in patients using orthodontic toothbrush along with Interdental Proxa brush. Intergroup comparison analysis suggests better plaque control with use interdental proxa brush compared to standard tooth brush with uniform Bristles. There was statistically

significant difference was found in mean plaque scores of Group II vs. group I ($P < 0.05$). There was no significant difference between group II and Group III.

The Mean Gingival scores for Group I, II and Group III are presented in Table 2. The gingival index is minimum in Group II (Orthodontic tooth brush and Interdental proxa brush). The Intergroup analysis suggest gingival scores are statistically significant compared to group I.

Table2. Mean Gingival scores among the group

Groups	Baseline	3 Month	6 Month
Group I	1.485+0.34	1.385+0.37	1.465+0.15
Group II	1.246+0.32	1.195+0.34	1.075+0.38
Group III	1.344+0.42	1.234+0.26	1.125+0.36
Total	1.356+0.36	1.271+0.32	1.221+0.30

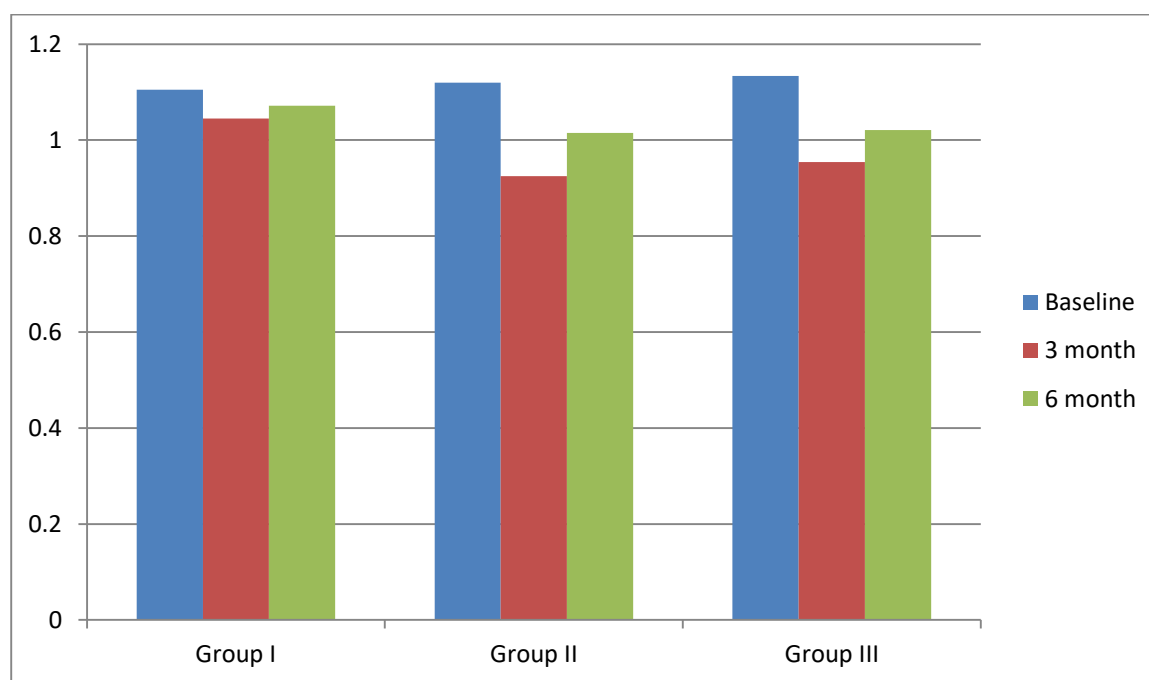
Discussion:

Patients undergoing fixed Orthodontic Treatment with fixed orthodontic appliance are at high risk of developing

gingival inflammation. Multiple fixed attachments make very difficult for patient to clean tooth surface. Increase plaque accumulation is primary etiological factor

in gingivitis. The patient inabilities to clean his teeth adequately around fixed orthodontic devices promote plaque accumulation. There is need of high motivation and awareness about the importance of good oral hygiene during fixed orthodontic patient. Large portions of the buccal surfaces are covered by adhesive attachments. Areas cervical to a bracket base and mesial and distal to the bracket body are very difficult to clean with conventional tooth brush.

Boyd conducted a study to evaluate the effect of Plaque control measures on gingivitis and found that a structured plaque control measures and found that a Figure1. Effect of different tooth brush protocol in plaque reduction.



The results obtained from this study suggest that there is reduction of plaque and gingival score in all the three groups. In Group II Orthodontic tooth brush and interdentally proxa brush are used. The plaque index score suggest significant reduction in PI score compared oral prophylaxis with conventional tooth brush. Both Group II and Group III used interdentally proxa brush to maintain oral hygiene along with tooth brush with fluoridated tooth paste. Usually proxa brush is indicated in old age patient with gingival recession to clean interdental

structured plaque control program only was effective in reducing dental plaque and gingivitis¹⁵. Repeated motivational sessions are needed for better Plaque control. Dental plaque is a primary etiologic factor in gingivitis. The patient inabilities to clean his teeth adequately around fixed orthodontic appliance promote plaque inflammation. Irregular and crowded position of teeth make more challenging for orthodontist¹⁶. The role of different tooth brush and interdental aides available in market for better oral hygiene can be used to understand better patient care for fixed orthodontic patient¹⁷.

area¹⁸. Proxa Brushes are very effective in cleaning mesial and distal of bracket.

This study shows that all the methods are equally effective in controlling gingival health. The clinical gingivitis score is least in group II patient using Interdental proxa brush along with orthodontic tooth brush. The study suggests use of proxa brush reduces plaque accumulation.

Conclusion:

There is need of different oral hygiene protocol of patients undergoing fixed orthodontic treatment. The conventional

tooth brush is less efficient in cleaning around braces. Orthodontic tooth brushes have bristles at different level for cleaning cervical area. The interdental proxa brush is easy to clean mesial and distal to brackets and also passes below the orthodontic arch wire. There is need to understand the role of interdental Proxa brush in fixed orthodontic patients. It can be used along with Orthodontic or conventional tooth brush for good oral hygiene.

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