

Glance at preventive oral health: in orthodontic patient

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Abstract

The ultimate goal of orthodontic treatment is to establish good occlusion, to improve dental and facial aesthetics without hampering periodontal status. We can do a lot to reduce gingivitis, periodontitis, caries that our patient may suffer during course of treatment. As young people are motivated to maintain oral health, then chances of maintaining oral hygiene throughout life are excellent. As an orthodontist, we see patient regular interval and extended duration we can initiate and monitor the whole learning process of oral hygiene. However it is considered that orthodontists has chance rather say obligation to play greater role in preventive dentistry. Motto of this article is to evaluate the information available on oral hygiene to support orthodontic patient in same.

Key words: orthodontic treatment, oral hygiene and prevention.

Introduction

In today's aesthetic scenario patient with orthodontic treatment need increasing desirable outcome from orthodontic treatment chiefly depends on periodontal status of the patient. Orthodontic treatment with fixed appliances is bound to shift oral environment towards increased plaque accumulation [1], change in its microbial composition and sophisticated cleaning.

Failure in implementation of preventive programme, frequently leads to enamel decalcification and gingivitis. [2] Oral hygiene and maintenance of hygiene becomes cumbersome in presence of orthodontic components. Hence, elimination of plaque is the main task to over-ride the problems mentioned above. Orthodontic appliances changes oral environment significantly which results in accumulation acid producing bacteria. This undesired change in oral microbes leads to hyperplastic gingivitis. Gingivitis is so prevalent in orthodontic patient that it is seen by many orthodontists as inevitable by-product of therapy. [3]

The appliances usually contribute periodontal disease in that they collect microorganisms. [4] Caries risk is associated with many factors such as increase in plaque accumulating sites increased by appliances, age of patient and change in bacterial flora in orthodontic treatment.

We can do a lot to reduce gingivitis, periodontitis, caries that our patient may suffer during course of treatment. As young people are motivated to maintain oral health, then chances of maintaining oral hygiene throughout life are excellent. As an orthodontist, we see patient regular interval and extended duration we can initiate and monitor the whole learning process of oral hygiene. However it is considered that orthodontists has chance rather say obligation to play greater role in preventive dentistry. Motto of this article is to evaluate the information available on oral hygiene to support orthodontic patient in same.

Periodontal tissues in Orthodontic Treatment

Fixed orthodontic treatment makes brushing difficult which results in accumulation of plaque and in turn results in gingivitis which progresses to periodontitis during tipping and extrusive movement. The gingival pocket deepens and results in development of pseudo pockets. These pseudo pockets provide an opportunity for colonization to subgingival bacteria leading to periodontal breakdown. This periodontal destruction undergoes some degree of PDL destruction. However, removable appliances have

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not been shown to cause such periodontal liability because of ease of cleansing with the appliances.[5]

Importance of good oral hygiene

It is established that patients with poor oral hygiene affects orthodontic treatment outcomes, impacts quality of orthodontic treatment and prolongs treatment times. It has been stated that each "poor oral hygiene" entry into a patient chart relates to a 0.67 month increase in treatment time. Reports have shown that 3 or more patient entries for "poor oral hygiene" increase treatment time by 1.2 to 2.2 months. Other consequences of poor oral hygiene during orthodontic treatment affect the quality of the end result of treatment.

The detrimental influence of plaque on the periodontal tissues is becoming more and more evident. Previously more attention was given to apical root resorption during orthodontic treatment. However root resorption involves limited root surface areas and is not usually progressive once appliances are removed. Today more attention is directed to the marginal periodontal damage from neglected or improper oral hygiene which not only manifests itself during orthodontic treatment but continues beyond the time of appliance removal.[6] This thrusts a challenge to the orthodontist and his auxiliary personnel to increase the patient's oral hygiene awareness.

Motivation of Patient & Oral Hygiene Training

Orthodontic treatment with fixed appliances leads to an increased risk of enamel demineralization that is exacerbated in patients with poor oral hygiene. A recent review of literature suggests that orthodontic treatment causes small detrimental effects to the periodontium. The placement of fixed orthodontic appliances complicates the use of standard oral hygiene measures as orthodontic appliances protect the dental plaque from mechanical removal.[7]

Poor oral hygiene allows significant plaque accumulation around brackets and subsequent white spot lesions[8] can occur rapidly, usually on the cervical and middle thirds of the buccal surfaces of bracketed teeth.[9] Destructive processes in the periodontium are also observed in poor oral hygiene patients during orthodontic treatment as gingivitis and gingival hyperplasia. The accumulation of supra- and subgingival plaque and the establishment of a pro-inflammatory state that leads to these destructive processes, as well as increasing the potential for developing other periodontal diseases.[10]

Prophylactic programs and good oral home care for patients who are undergoing orthodontic treatment is of paramount importance. Efforts have largely focused on either methods used for control rather than the processes involved. The Cochrane group recently reported that power toothbrushes with oscillation rotation action remove more plaque and reduce gingivitis better than manual toothbrushes in the short term as well as reduce gingivitis scores in studies over 3 months long.[11] Nevertheless, as few as 12% of the orthodontists always advised the use of an electric toothbrush.[12] To inhibit white spot lesions, twice daily use of over-the-counter (0.05%) neutral sodium fluoride rinse or twice daily 0.4% stannous fluoride gels is recommended. Another effective home-care tool is the use of an oral irrigator to remove loosely adherent plaque. When the above home-care regimen, alongside flossing and brushing with a fluoridated toothpaste twice daily, isn't enough to maintain adequate periodontal health for orthodontic movement, a 0.12% chlorhexidine rinse routine could be implemented as last resort.

Treatment planning

Every patient should be screened for periodontal health and caries before starting orthodontic treatment. Patient should be explained oral hygiene majors and his responsibilities towards oral hygiene during the course of treatment.



Fig 1 Gingivitis due to crowding

Plaque removal

1) Tooth brushing (fig. 2)-

Methods of Toothbrushing

Oral debris and plaque most commonly removed by toothbrushing. There are several tooth brushing techniques, at the same time controversy exists in superiority of them. In past roll method was most commonly suggested. However, a number of new investigations comparing the roll technique with the horizontal scrub, vibratory (Bass, Charter's), and



Fig. 2 Tooth brushing technique

circulatory (Fone's) methods indicate that the roll method is inferior to, or no better than, the other methods with respect to plaque control.[13]

No reports have been made concerning the clinical effectiveness of the various recommended methods or toothbrushing in orthodontic patients. However,

a) Good cleansing along the gingival margins is of paramount importance in orthodontic patients to prevent gingivitis[14] and demineralizations [15] and vertical brushing has been found inadequate along the gingival tooth areas;

b) Horizontal brushing methods imply active brushing all the time, as no time is lost for replacement of toothbrush position. After studying all available data, it should be considered that horizontal brushing with either the scrub or the Bass technique as the method of choice for patients wearing orthodontic appliances. A clinician should train the patient in toothbrushing.

Frequency of Brushing

There is no data available showing that brushing frequently is harmful. So it is not possible to place any limit on tooth brushing frequency in a single day. At the same time one should keep in mind that tooth brushing effectively removing the plaque. Brushing after every meal is necessary. If it is not possible through rinsing of the mouth after every meals is obligatory, so that it will remove all food debris around the orthodontic appliances.

Types of toothbrushes

Manual and electronic toothbrushes are available:

Manual Toothbrushes:-

Bi-bevel Manual brushes are available. They have longer bristles on the edges and shorter ones in the middle. This type of brushes cleans the area above and below brackets.

Electronic Toothbrushes:- (fig. 3)

Electronic toothbrushes are available with short pointed bristles. These are more effective than conventional toothbrushes used by orthodontic patients. These brushes remove inter-proximal plaque more effectively with minimal trauma to dental tissue.



Fig. 3 Powered tooth brush

Other Tools for Patient:

i) Single Tufted Brushes:- (fig . 4)

These are brushes helpful for the patient to get in between their teeth and remove food debris.

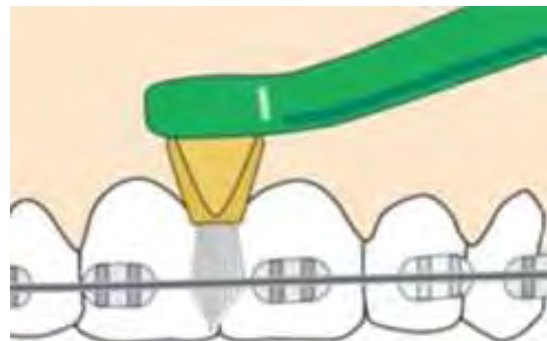


Fig. 4 Single Tufted Brushes

ii) **Oral Irrigators** : These instruments jets (fig. 5) stream of water which is helpful in removing food debris in addition to brushing. Use of chlorhexidine with specially modified irrigating tips called as 'Pik Pocket (Teledyne Corporation)' can be used to directly to irrigate the pockets with medium pressure if gingival bleeding on probing persists.[16]

iii) **Flossing** : It is difficult for flossing with braces. But some special products are available which should be used for flossing. When braces are first put on, orthodontist's should review flossing techniques. (Fig. 6) Flossing should be done least once a day.



Fig. 5 Oral Irrigators

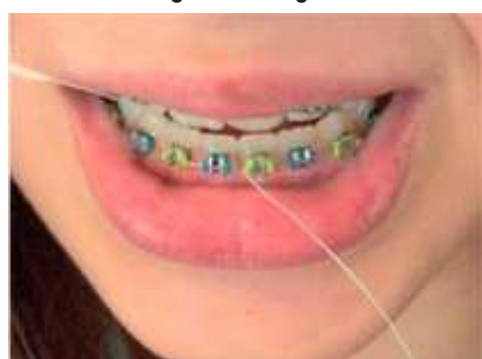


Fig. 6 Flossing in orthodontic patients

iv) **Disclosing solutions:** Disclosing tablets and solutions use vegetable dye to highlight plaque or debris in the mouth. These solutions are adjunct in maintaining oral hygiene.

v) **Chemical Agents:-**

Chlorhexidine:-It is antimicrobial agent active against Gram positive, gram negative organisms and yeasts. It is particularly suitable for the inhibition of plaque formation as it has the ability to maintain effective concentrations for prolonged periods of time, by way of binding to soft and hard tissues, a process known as substantivity.[17]

Repeated studies have shown that a 0.1 to 0.2 percent solution of chlorhexidine gluconate used as a one minute rinse (10 ml) twice daily inhibits the development of gingivitis. A three month use of 0.12% chlorhexidine approximately reduced 65% plaque, 77% gingival bleeding.(18) Main problems with its use was potential staining

vi) **Anti Plaque Agents:** In addition to Toothbrushes , chlorhexidine there are many agents such as stannous fluoride, Listerine, triclosan help in plaque control. Stannous fluoride is helpful in orthodontic patients to prevent decalcification. It is also effective against gingivitis. Listerine rinse contain 26% alcohol and should be rinsed twice daily for one minute for

antigingivitis effect without dilution. Triclosan toothpastes have good anti-gingivitis effect, good taste and good control against supragingival calculus.

Treatment of Decalcification

Best method to prevent Decalcification during orthodontic treatment is use fluoride toothpaste. Fluoride increases rate of initial mineralisation and helps to prevent carious process. Demineralisation may be present in the form of White spot or yellow stain. Enamel can also be remineralized with Casein Phosphopeptide- Amorphous Calcium Phosphate preparations. CPP-ACP is capable to be absorbed through the enamel surface and could affect the carious process.(19)

In severe decalcification post orthodontic treatment restoration might be required. Mild decalcification cases can be corrected by use of fluorinated toothpastes, and other forms of fluoride.

Treatment of Gingival Recession (fig. 7):-

Clinician should follow interdisciplinary treatment plan while treating periodontally compromised orthodontic cases. Periodontally compromised teeth subjected to orthodontic force leads to periodontal fibers breakdown which is difficult to regenerate.



Fig. 7 fig. Gingival recession during orthodontic treatments

As a result, with loss of bone support, center of resistance of the involved tooth moves more apically resulting in teeth being more prone to tipping movements than required bodily movements. Supra gingival plaque can shift to subgingival position in a plaque infected tipped/tilted teeth inducing an apical shift of the connective tissue attachment and formation of pockets and further loss of attachment. Due to risk of having more PDL attachment loss, very light forces must be applied. In this case any grafting of soft tissue should be postponed until active tooth movement is completed. In cases of bony defects, teeth can be moved orthodontically provided the remaining bone and periodontium are brought to healthy states.

Retention

Post orthodontic treatment removable or fixed retainers are necessary to prevent any relapse of the treatment and allow time for reorganization of the gingival and periodontal tissues.[20] Patient should be motivated for proper use of retainers, to prevent damage to the tissue. If patient have removable orthodontic appliance it should be cleaned regularly.

Conclusion

Patient undergoing orthodontic treatment should be thoroughly educated about the importance of oral hygiene not only during course of treatment but also after it. This will help them as well as hastening the treatment and getting best possible results.

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