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.

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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

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tipping and extrusive movement.The gingival pocket deepens and results indevelopment of pseudo pockets. These pseudo pockets provide an opportunity for colonization tosubgingival bacteria leading to periodontalbreakdown. This periodontal destruction undergoes some degree of PDL destruction. However, removable appliances have not beenshown to cause such periodontal liability becauseof ease of cleansing with the appliances.[5]

Importance of good oral hygiene:

It is established that patients with poororal hygiene affects orthodontictreatment outcomes, impacts qualityof orthodontic treatment andprolongs treatment times. It hasbeen stated that each "poor oralhygiene" entry into a patient chartrelates to a 0.67 month increasein treatment time. Reports haveshown that 3 or more patient entries for "poor oral hygiene"increase treatment time by 1.2 to 2.2 months. Other consequencesof poor oral hygiene during orthodontic treatment affect the quality of the end result of treatment.

The detrimental influenceof plaque on the periodontal tissues is becomingmore and more evident. Previously more attentionwas given to apical root resorption duringorthodontic treatment. However root resorptioninvolves limited root surface areas and is notusually progressive once appliances are removed.Today more attention is directed to the marginalperiodontal damage from neglected or improperoral hygiene which not only manifests itself duringorthodontic treatment but continues beyond the time of appliance removal.[6] This thrusts a challenge to the orthodontist and hisauxiliary personnel to increase the patient's oralhygiene awareness.

Motivation of Patient &Oral Hygiene Training:

Orthodontic treatment with fixed appliances leadsto an increased risk of enamel demineralization thatis exacerbated in patients with poor oral hygiene.A recent review of literature suggests that orthodontictreatment causes small detrimental effects to theperiodontium. The placement of fixed orthodonticappliances complicates the use of standard oralhygiene measuresas orthodontic appliances protectthe dental plaque from mechanical removal.[7]

Poor oral hygiene allows significantplaque accumulation aroundbrackets and subsequent whitespot lesions[8] can occur rapidly,usually on the cervical and middlethirds of the buccal surfaces ofbracketed teeth.[9] Destructiveprocesses in the periodontium arealso observed in poor oral hygienepatients during orthodontictreatment as gingivitis andgingival hyperplasia. The accumulationof supra- and subgingival plaque and theestablishment of a pro-inflammatory statethat leads to these destructive processes,as well as increasing the potential for developingother periodontal diseases.[10]

Prophylacticprograms and good oral home carefor patients who are undergoingorthodontic treatment is ofparamount importance. Effortshave largely focused on eithermethods used for control ratherthan the processes involved. TheCochrane group recently reportedthat power toothbrushes withoscillation rotation action removemore plaque and reduce gingivitisbetter than manual toothbrushes in the short termas 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%) neutralsodium fluoride rinse or twice daily 0.4% stannous fluoride gels is recommended. Another effectivehome-care tool is the use of an oral irrigator toremove loosely adherent plaque. When the abovehome-care regimen, alongside flossing and brushing with a fluoridated toothpaste twice daily, isn't enough to maintain adequate periodontal health fororthodontic movement, a 0.12% chlorohexidine rinseroutine 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 andhis responsibilitiestowards oral hygiene during the course of treatment.

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 exits in superiority of them. In past roll method was most commonly suggested. However, a number of new investigation comparing the roll technique with the

horizontal scrub, vibratory (Bass, Charter's), and 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.

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.

ii) **Oral Irrigators:-**These instruments jets (fig. 5) stream of water which is helpful in removing food debris in addition to brushing. Use ofchlorhexidine with specially modified irrigating tipscalled as 'Pik Pocket (Teledyne Corporation)' canbe 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. Whenbraces are first put on, orthodontist's should review flossing techniques. (Fig. 6) Flossing should be done least once a day.

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:**

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

Repeated studies have shown that a 0.1 to 0.2 percent solution of chlorhexidinegluconate used as aone 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 antigingivitiseffect without dilution. Tryclosantoothpastes 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 processs. Demineralisation may be present in the form of White spot or yellow stain.Enamel can also be remineralized with Casein Phosphopeptide-Amorphus Calcium Phosphate preparations. CPP-ACPis capable to be absorbed through theenamel 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.

Fig 1 Gingivitis due to crowding

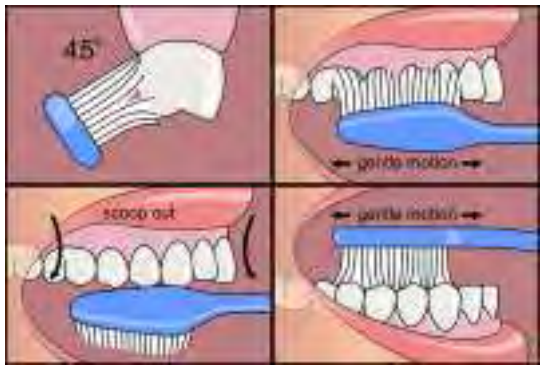

Fig. 2 Tooth brushing technique

Fig. 3 Powered tooth brush

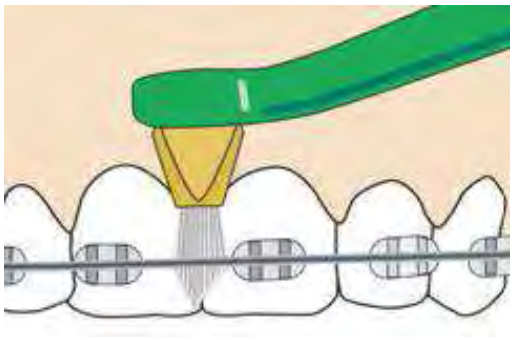

Fig. 4 Single Tufted Brushes

Fig. 5 Oral Irrigators

ig. 6 Flossing in orthodontic patients

Fig. 7 fig. Gingival recession during orthodontic treatments

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.

As aresult, 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 tosubgingival 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 casesof bony defects, teeth can be movedorthodontically provided the remaining bone andperiodontuim are brought to healthy states.

Retention:

Post orthodontic treatment removable or fixed retainers are necessary to prevent any relapse ofthe 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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