

**ORAL HYGIENE IN ORTHODONTICS: A REVIEW****Dhritiman Barman\***

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**ABSTRACT**

Increased incidence of dental caries and periodontal breakdown is seen with patients having orthodontic problems. It is due to formation of the bio-film and dental plaque. Acidogenic bacteria grow in this environment. Lack of motivation leads to poor maintenance of oral health. It increases the treatment time and sometimes the orthodontists are compelled to discontinue the treatment due to lack of maintenance. This review article describes the importance and various methods of maintaining oral hygiene in orthodontic patients.

**KEYWORDS:** Dental plaque, Oral hygiene, Tooth brushing, Interdental aids, Disclosing agents.**INTRODUCTION**

It is necessary to maintain oral hygiene during orthodontic treatment. There is a recent trend of alignment of anterior teeth not only among the young adolescents but also among the adults. It not only improves smile esthetics but also facial esthetics. Appliance contribute to environmental changes in mouth and lead to production of acid- producing bacteria.<sup>[1]</sup> Orthodontic appliance, itself does not cause inflammation unless it is impinging the supporting structures of the tooth.<sup>[2]</sup> Plaque formation is greatly associated with the use of fixed orthodontic appliance.<sup>[3]</sup> It is due to the accessibility especially in the inter-bracket span and around gingival margins.<sup>[4]</sup> Deposition of plaque leads to gingivitis, white spot lesions, carious lesions and ultimately periodontal break down.<sup>[5]</sup> It hampers the continuity and extends the treatment time. About 5-10% orthodontic patients do not complete treatment due to poor maintenance of oral hygiene.<sup>[6]</sup>

**Behaviour and Compliance**

Behaviour, personality develop during adolescence.<sup>[7]</sup> The compliance rate of adolescents is low.<sup>[8]</sup> Long term treatment such as orthodontic treatment has 50% compliance rate.<sup>[9]</sup> There are demographic, psychosocial, psychologic and behavioural factors.<sup>[10]</sup> Demographic factors include gender, sex, socio-economic status. Psychosocial and psychologic factors include the relationship of the patients with their parents, peers and the orthodontist. These influence the behavioural factors. On the other hand, the experience of their pre-treatment visits also influence the behaviour.<sup>[7]</sup>

**Orthodontist and The patient**

The pre-treatment visit to an orthodontist is crucial. Respecting the patients and treating them as equals help

to grow rapport.<sup>[11]</sup> It enhances the self-image of the children and adults. They come likely to be motivated towards the practice of maintaining good oral health.<sup>[12]</sup> Motivation on maintenance of oral health should be started before the treatment commences.<sup>[12]</sup> The child should be the center of attention and these visits help to gain the trust and build a bond between the orthodontist and the child. There should be a discussion about the present malocclusion. The child as well as the parents should be made aware of the importance of maintaining oral hygiene.<sup>[11]</sup>

On the other hand, if a patient present with accumulation of plaque and calculus, the patient should be made aware of the nature of the disease and the possible consequences if they were left untreated.<sup>[11]</sup> The importance of sound tooth supporting structures must be discussed. Oral prophylaxis should be done at first. Time should be given for the tissues to heal. The patient is warned about the discontinuation of the orthodontic treatment if proper maintenance of oral hygiene is not done.

Oral hygiene instruction is given to a patient in the first visit who requires time to regain healthy supporting structures before diagnostic records are taken. The use of intra-oral camera is important for patient education. It motivates the patient to take care of his intra-oral structures. Effective brushing technique should be demonstrated with a soft- bristled toothbrush on a typodont.<sup>[11]</sup>

**Methods for maintaining oral hygiene**

Tooth brushing is the most common method of removing food debris. There is a debate among many researchers about the efficacy of various brushing methods. Roll

technique was once advocated the most efficient.<sup>[13]</sup> Later, new investigations indicated that the roll method is inferior to the Bass, Charter and Fone's technique.<sup>[14]</sup> Children lack the dexterity to master the roll method. The best cleansing effect is seen when they use the horizontal techniques.<sup>[15]</sup> Horizontal techniques proved to be more effective than the vertical techniques especially along the gingival margins.<sup>[16]</sup> The procedure for horizontal technique should be back and forth scrub motion on the buccal and lingual surfaces. Short strokes covering approximately two teeth should be performed. As it is not established when the plaque turns cariogenic, the maximum limit on the cleansing should not be demarcated.<sup>[17]</sup> Although there is no recommended tooth brush for cleansing of tooth, the orthodontic tooth brush should be small, medium, hard or soft, nylon bristled and multitufted.<sup>[15]</sup> Neither damage to the appliances nor the tissues has been reported due to manual or electric tooth brushing.<sup>[18]</sup> Increased thoroughness of brushing throughout the treatment span can lead to gingival recession.<sup>[19]</sup>

Disclosing agents can be used as an aid for patient education as well as to improve oral hygiene.<sup>[20]</sup> Cohen and colleagues have reported that the use of disclosing agents not only resulted in better plaque removal but also helped in diminution of gingival inflammation.<sup>[21]</sup>

In addition to the general tooth brushes, supplemental aids such as tooth picks, dental floss, single tufted brush, interproximal brush have been introduced for cleansing of the interproximal areas. It is difficult to use dental floss below and past the orthodontic wires. In wide open interproximal areas, inter-dental brush is the most suitable aid for removing plaque.<sup>[22]</sup> Vigorous use of tooth picks and dental floss can cause severe gingival damage and lead to gingival recession.<sup>[17]</sup>

In addition to mechanical cleansing, chemical agents can be used as a plaque inhibitor. According to Gjermo, the mode of action of chemical agents include prevention of plaque formation, inhibition of calcification of microbial deposits and changes in the pathogenicity of dental plaque.<sup>[16]</sup> Urea peroxide in gel form has achieved success in removing supragingival plaque.<sup>[23]</sup> Fogel and Magill also reported a significant decrease in caries rate when used in supplement to the usual oral hygiene maintenance practice.<sup>[23]</sup> Chlorhexidine, a potent cationic disinfectant with an antimicrobial effect, can be used to prevent plaque formation.<sup>[24]</sup> Though chlorhexidine has side effects such as discoloration of teeth, tooth fillings, repeated studies have found that the use of chlorhexidine in 0.1 to 0.2 % aqueous solution can prevent the development of caries and gingivitis simultaneously.

## DISCUSSION

The placement of fixed appliances impedes tooth brushing and promotes biofilm formation.<sup>[25]</sup> Information of patient's oral hygiene maintenance practice helps to take effective measures. Manual tooth brushing without supplemental aids such as dental floss, tooth picks,

interproximal brush produced satisfactory results in a study by Guo et. al.<sup>[26]</sup> A number of individuals reported a preference for use of mouth rinses as a plaque control measure in the same study. A study by Mei et. al reported that the patients were able to clean the occlusal surface of the brackets better than the gingival, mesial or distal areas.<sup>[27]</sup> Therefore, the patients were instructed to clean the gingival areas specifically. Disclosing agents can help the patients to get motivated in such situations.

## CONCLUSION

Oral hygiene is an important factor for the success of orthodontic treatment. More attention should be provided to the patients with poor oral hygiene to make them understand the importance of sound periodontal structures. Properly maintained oral hygiene not only help the patient to maintain a good smile esthetics but also help the orthodontist to finish the treatment within the pre-determined schedule.

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