

*Review Article***Brush up the Perfect Smile: Oral Health Care during Orthodontic Treatment**

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**Abstract:** Good oral hygiene regimen is required to prevent gingival inflammation, periodontitis, white spot formation and dental caries. Orthodontic treatment further complicates the oral hygiene and it is the orthodontist's duty to motivate, instruct, check and whenever necessary, re-instruct his patients about proper home care procedures before, during and after the period of fixed appliance therapy. This will enable the orthodontist to provide their patients with an improved esthetic facial appearance, a well-functioning occlusion, while maintaining a healthy gingiva and dentition.

Keywords: Orthodontic; Tooth; Brushing; Gingiva; Oral Hygiene; Inflammation.

**INTRODUCTION**

Oral hygiene is greatly complicated following the placement of fixed orthodontic appliances. White spot formation on the labial surface of bonded or banded teeth during orthodontic treatment has long been recognized as a problem. Failure to manage plaque removal properly may lead to loss of tooth support and to an increased number of carious lesions.<sup>1</sup>

It is generally conceded that the greater plaque-retentive nature of orthodontic appliances causes plaque accumulation at the gingival margin and may contribute to incidence and severity of gingival inflammation, although there is no scientific basis to support the concern that orthodontic tooth movement may initiate gingivitis or cause periodontal attachment loss.<sup>2</sup> Most cases of gingivitis may remain stable for long periods of time.

However, some gingivitis lesions may progress to periodontitis, resulting in the irreversible loss of tooth-supporting tissues. This potential risk is unacceptable to most orthodontists and their patients and is therefore recommended to ensure good gingival and periodontal health before the commencement and during orthodontic treatment. Monitoring gingival and periodontal health throughout the orthodontic treatment and repeated reinforcement of acceptable oral hygiene routines have become an integral part of modern orthodontic practice.

The value of good brushing and oral hygiene care during orthodontic treatment seems

difficult for children and even adults to embrace. Sometimes it's easy to get a patient to care about cleaning around braces, and at other times it's nearly impossible. It's not unusual if an orthodontist comes across patients with poor or maybe nonexistent toothbrushing habits. It is sometimes seen in such patients, mainly in children that they are not motivated enough.

Acceptable oral hygiene is a challenging task to maintain during orthodontic treatment in the presence of bands, wires and ligatures. It requires high compliance and the patient must be encouraged to take good care of their oral cavity as hygiene can prove difficult in these cases.

**Practical methods to maintain oral hygiene in patients undergoing orthodontic treatment:**

If the orthodontist succeeds in making the patient concerned about his/her hygiene, possible periodontal damage during treatment is compensated in the long run. On the other hand, when the hygiene is neglected, more damage is initiated during treatment. Lack of patient motivation or ability to control his/her periodontal situation, may lead to questioning the long-term benefits of the orthodontic treatment.<sup>3</sup>

It is essential therefore, that the hygiene problem in orthodontics not be dismissed as a matter of patient or parent's responsibility after a cursory sentence of instruction and warning. Every orthodontist should motivate, instruct, check and, whenever necessary, re-instruct his patients about

proper home care procedures before, during and after the period of fixed appliance therapy.

**Patient motivation:** The first meeting of the patient and the orthodontist is crucial regarding patient motivation, especially when oral hygiene is in question. Orthodontist should be aware and take care of their patient's oral hygiene problems before treatment starts since, one of the main goals of orthodontics is to achieve dental and skeletal harmony while preserving healthy teeth and support surfaces.<sup>3</sup>

All new orthodontic patients must regain good dental health before diagnostic records are taken and should be made thorough with the oral health instructions. Dental plaque and the manner by which plaque waste products break down gingival tissues and enamel should be described to patient. The consequences of this breakdown should be discussed. The patient learns that careful cleaning twice a day, while wearing orthodontic appliances will disrupt plaque formation, and damaging waste products should not be allowed to accumulate.

**Tooth brushing:** Tooth brushing is of foremost importance in removing food debris and plaque from around orthodontic appliances. A special orthodontic toothbrush can be used for this purpose.<sup>4</sup>

### 1. IMPORTANCE OF BRUSHING:

The orthodontic appliance causes a great increase in the accumulation of food and bacterial plaque on the teeth. Failure to remove the plaque by frequent and thorough brushing, can cause swollen and bleeding gums, mouth odor, white spot lesions and decay of teeth.

2. WHEN TO BRUSH?: It is important to brush immediately following each meal or snack, particularly if foods high in sugar content have been eaten. Most of the damage to teeth occurs within the first half hour after eating. It is important that orthodontic patients thoroughly clean their teeth with a toothbrush for a minimum of 4 minutes

after every meal, at least 3 times a day. If it is not possible to brush, mouth should be rinsed vigorously with water to remove at least some of the food particles trapped by the appliance.

### 3. HOW TO BRUSH?:

- Patient should be instructed to place the brush at an angle of 45 degrees against the gums. Gently brush along the gums where the gums and teeth meet, using a small circular motion on each tooth.
- Spend at least 10 seconds on each tooth before moving onto the next tooth.
- Gently brush the braces. Brush in and around all of the brackets and wires and also under the wires.
- Brushing both the palatal/lingual and the labial surfaces of teeth using a gentle circular motion on each tooth. (Figure 1-2 show the steps of toothbrushing)
- For the chewing surfaces, use a firm back and forth motion
- Brush the tongue and cheeks



Figure 1a showing the method of brushing on the labial/buccal surface of the teeth; 1b showing the method of brushing on the lingual/palatal surface of the teeth

TYPE OF BRUSH: A brush with a small head and with soft bristles because they damage gum less, is preferred. Orthodontic toothbrushes may also be used. However, the brushing technique

and the regularity in doing it is probably more important than the choice of the toothbrush per say.<sup>5</sup>

4. A fluoride containing toothpaste should be used.
5. Patient should be advised to remove any intraoral elastics or removable appliance before brushing.

**Interproximal brushing:** Patient should be advised to use an interdental brush to clean between the teeth and archwire or where there are larger spaces between teeth. Proper size brush should be selected to fit the space. A soft rubber interdental stimulator can also be helpful in cleaning and massaging the interproximal areas.<sup>6</sup>

**Flossing:** Flossing each tooth thoroughly with a clean section of floss is advised by threading a 45cm piece of floss through a floss threader. The floss should be then inserted between the teeth and under the archwire and slide up and down against the tooth surface and under the gumline (figure 3-4 show the method of flossing between the teeth and under the archwire).



Figure 2a & 2b: Showing the method of flossing between the teeth and under the archwire.

**Irrigation:** Oral irrigator (WaterPik® Water Flosser) helps to remove food debris and plaque from areas where toothbrush cannot reach. It is easy and clinically proven to be more effective than traditional dental floss.<sup>7</sup>

However, water irrigating devices cannot by any means be regarded as substitutes for more effective plaque-removing methods, such as tooth-brushing and flossing; rather, they should be considered as an adjunct to the total oral hygiene program.

**Mouth washes:** Antimicrobial activity of mouthwashes has the advantage of accessing hard to reach areas. Considerable clinical trial evidence shows that oral hygiene status is significantly improved when antibacterial mouth rinses are added to the daily oral hygiene regimen (tooth brushing and flossing) compared with tooth brushing and flossing alone.<sup>8</sup> Rinsing with mouthwash should be used as an adjunct to brushing and not replace flossing, in patients who struggle to floss regularly in the presence of fixed appliances. In such cases essential oil mouthwash such as Listerine, which has recognizable bactericidal activity should be given consideration. Orthodontists can instruct their patients to rinse twice daily with 20 mL of Listerine in addition to brushing and flossing. Rinsing mouth thoroughly with an anti cavity fluoride mouthwash (NaF 0.05% or 0.2%) help prevent enamel decalcification during active fixed orthodontic treatment. Fluoride in solution at the time of acidic attack on the enamel considerably slows down the rates of decay. Alcohol-free rinses should be used for children.<sup>8,9</sup>

**Disclosing tablets and solutions:** Biofilm disclosing agents have been used widely in Europe and the United States for oral hygiene education to promote regular brushing. Disclosing tablets and solutions use vegetable dye to highlight plaque or debris in patient's mouth. The use of images showing the severe consequences of biofilm accumulation acts as a visual aid to demonstrate the oral hygiene status and enhance oral hygiene in patients undergoing orthodontic treatment with fixed appliances.<sup>10,11</sup>

**Fluoride varnish:** Fluoride application in the form of fluoridated mouthwash is recommended but it requires a high level of compliance on the part of the patient. Fluoride varnish, when applied as a

protective coating over the tooth surface around orthodontic appliances, has been proven to decrease enamel solubility and diminish the incidence of white spot lesions. For instance, fluoride varnish, composed of 5% sodium fluoride in a resin base, has shown a reduction in white spot incidence of about 50%.<sup>12</sup> Therefore, periodic fluoride application, independent of patient compliance, may provide a clinically effective solution, yet it has also been observed that such material cannot completely prevent white spots. Duraphat (5% NaF), fluoroprotector (1% difluorosilane and 0.1% F), duraflo (5% NaF) are the commonly used Fluoride varnishes. Application of fluoride varnish every 3-6 months is the most cost-effective method for high and medium risk group and promotes adequate protection. Slow release of fluoride is seen for periods of up to 6 months. The greatest release occurs in the first 3 weeks and more gradual release thereafter.

**Dietary considerations:** Patient with braces prefer or switch over to convenience foods such as cakes, pastries, ice creams and cookies, which are high in simple sugars. The frequency and not the quantity of sugar intake cause tooth decay in orthodontic patients. Gum – sugarless or otherwise, Sticky foods – toffees, candies etc. should be completely avoided. Consumption of sugar in between meals and in the form of the sugars in tea, coffee, soda and snacks should be checked.<sup>13</sup> Patients are advised to use sugar substitutes (sugar free sweeteners).

**Regular dental as well as orthodontic checks:** Regular dental check up would ensure and reinforce the oral hygiene routine of the patient. Regular oral prophylaxis and professional fluoride treatment should be scheduled. In case of decay, regular check up would ensure an early detection and removal of caries.

**CONCLUSION:** Patient motivation is the key to maintain a good oral hygiene, which depends mainly on the orthodontist's instructions and the interest of the patient. Given the potential, iatrogenic effects caused by orthodontic treatment, preventive methods should be provided for all patients

undergoing orthodontic therapy. The attitude of all parties involved toward oral hygiene contributes to the dentition's future. Failure to maintain the oral hygiene may affect the corrected malocclusion in the long run and the result of the orthodontic treatment may be lost in a few years due to periodontal disease or caries.

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**How to cite this article:** Kaur G, Verma VK, Sachan A, Singh K, Kour S. Brush up the Perfect Smile: Oral Health Care during Orthodontic Treatment. *Rama Univ J Dent Sci* 2015 Sept.;2(3):40-44.

**Sources of support:** Nil

**Conflict of Interest:** None declared