

Lingualnews.com

Volume 4, Number 1
February 2006

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Tooth burshing technique for Lingual Orthodontics

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Introduction

The oral hygiene of individuals with orthodontic appliances is often a problem since brackets and arch wires obstruct the path of tooth brush bristles. Hence, tooth brushing methods be modified during orthodontic treatment(1).

When oral hygiene is neglected, greater periodontal tissue damage may occur during orthodontics, making the long-term benefits of the orthodontic treatment questionable(2). However, success in making patients hygiene minded will avoid any such possible periodontal damage.

When a fixed lingual orthodontic appliance is used maintenance of good oral hygiene is of utmost importance due to several factors. Specifically, the close approximation of the brackets to the gingival margin and small inter-bracket distance, difficult access for brushing, possible intrusion of the maxillary incisors, calculus deposits on the mandibular anterior teeth, and the presence of closing loops or chains all contribute to making the maintenance of a high level of oral hygiene a major undertaking. In addition, disuse atrophy or hypertrophy of the gingival margins can occur due to lack of stimulation by food passing over the tissues(3).

Although inherent to the use of all fixed appliances is a need to adjust oral hygiene habits, buccal fixed appliances due to their popularity, have been evaluated with a various prophylactic procedures, toothbrushes, or mouthrinses(4). However, no such in depth comparison with regard to lingual appliances has been made even though special brushing techniques and oral hygiene aids are arguably more important during therapy with lingual brackets than with labial brackets since hygiene control

is more difficult on the lingual aspect than from the buccal. Furthermore, plaque accumulation, gingivitis, and demineralization are not detected by the patient as readily on the lingual side.

Fujita (1982) suggested the use of a unique toothbrush with eight tufts in two rows to brush the lingual surface (6). However, no research testing its effectiveness or comparing it to a conventional toothbrush has been carried out.



Fig 1:BITUFO™ two tuff brush

The smaller inter-bracket distance of lingual orthodontic appliances makes access by a regular toothbrush difficult. However, the small (0,17 mm bristles), rounded and pointed bristled-head design of the aforementioned end-tufted tooth brush with its straight at one end and angulated tufts at the other end, may potentially improve access to the problematic interproximal and under tie hooks areas during lingual orthodontic treatment (Fig 1).

Therefore, the **purpose of this study** was to investigate the aptly named end-tufted tooth brush and evaluate its ability to clean lingual tooth surfaces, especially in the zone under the arch wire of lingual appliances. Also, its ability to control or reduce plaque after proper tooth brushing instructions are given will be evaluated.

Materials and Methods

Eleven adult patients being treated with lingual orthodontic appliance were instructed in the proper use of the BITUFO™ tooth brush around the brackets, above and below the archwire with vibrated movements. The importance of under wire brushing and gum massage with the brush's bristles gingival to the bracket hook was also stressed.

The gingival tissue response to toothbrushing could be interpreted as plaque removal reducing infiltration of connective tissue by inflammatory cells. Toothbrushing improves microcirculation and increases oxygen sufficiency of gingival tissue and these effects could enhance gingival tissue response. Mechanical stimulation by toothbrushing enhances gingival fibroblast proliferation and collagen synthesis, and reduces inflammatory cell infiltration(5). Since the bracket hook blocks the natural messaging of the gums by food during eating, the brush massage becomes much more important. Emphasis was placed in the area between the canine and premolars because the offset placed in the wire at this point giving it the typical mushroom shape also creates an unhygienic area(5).

On the labial surfaces the Bass toothbrushing technique was taught using a regular soft toothbrush. To evaluate the toothbrushing method proposed we scored the plaque index using the Turesky modification of Quigley Hein method (1970)(7). The first measurement was taken before bonding brackets to know the own patient hygiene score. One week after bonding, patients received toothbrushing instructions as mentioned above.

During the one week interval patients were invited to brush their teeth as usual. Initial hygiene instruction was provide using a template with lingual brackets (Fig 2-3).

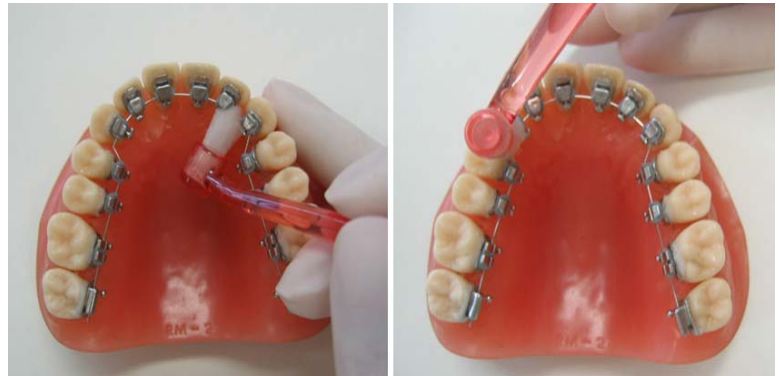


Fig 2,3: Toothbrushing around the braces with vibrated movement



Fig 4: The technique in a patient's mouth

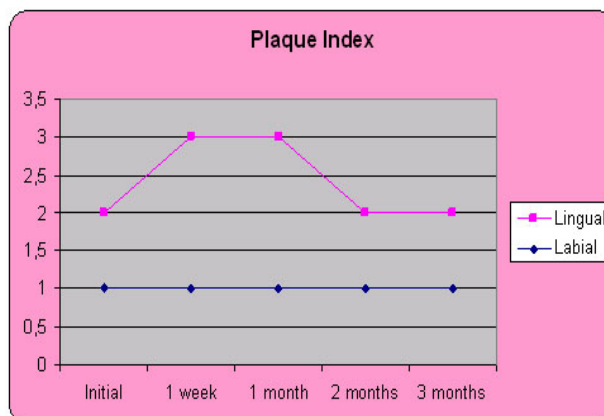


Fig 5: A patient doing the toothbrushing herself looking in a mirror

Following this, hygiene instruction was carried out directly in the patient's oral cavity. This was initiated by having the patient dissolve intraorally a plaque disclosing tablet (erythrosine). The plaque index was scored and the disclosed areas of plaque accumulation were shown with a mirror to attract patient's attention to his own plaque. Then, instructions were given directly in the patient's month by the operator, after which they were attempted by the patient (Fig 4-5). Then a definitive list of areas to brush was given to the patient. The teeth were brushed by starting with the most posterior tooth on the upper left side and going around the arch to the right. The same sequence was done in the lower arch. The buccal area was brushed with the same sequence using the Bass technique. When we were sure that the patient is able to appropriately clean his teeth, he was invited to go to the lavatory and brush his teeth until the total remove of the coloring. One, two and three months after bonding, the plaque score was reassessed and hygiene instruction reinforced. After each toothbrushing session we prophylaxed the entire dentition to eliminate all plaque residues.

Results

The results are shown in graph 1. It can be noticed that after 1 month the plaque control returns to numbers close to the initial values, showing that this technique can be useful to help lingual patients maintain their oral hygiene with lingual braces the same way they do without the appliance. On the other hand, the labial surface plaque index scores remained the same, implying that the patient maintained of his oral hygiene behavior.



Graph 1: Plaque control with lingual brackets returned to initial values after 1 month, labial surface plaque index scores remained the same.

Continuing this research, we are now comparing the use of this technique with lingual and buccal orthodontic patients to establish any possible difference of hygiene efficiency between appliance positioned on the lingual and the buccal surfaces.

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