Effect of super dental floss on oral hygiene in patients with fixed orthodontic appliances

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ABSTRACT

Background: orthodontic appliances contribute to plaque retention and interfere with the performance of good oral hygiene. This study was conducted to find the effect of using super dental floss in the oral hygiene of orthodontic patients.

Materials and methods: The study sample is comprised of 16 orthodontic patients (7 males and 9 females), ranging in age from 15–22 years at the beginning of orthodontic treatment. The quantity of plaque were evaluated after one week when patients wear orthodontic appliance then another recording was done after one week instruction of using super dental floss. By using disclosing tablets we account the quantity of plaque. We assessed 12 anterior teeth in each patient by using score from 0-3

Results: four teeth from 192 one represent 0 score and 34, 111, 43 teeth represent score 1, 2, 3 respectively before using super dental floss while 143, 37, 12, 0 represent number of teeth in score 0, 1, 2, 3 respectively after flossing. When the t-test was applied to test significant between plaque quantity before and after using super floss, a significant differences were noted.

Conclusion: Patients' instructions to use super dental floss are considered as an important factor for planning good oral hygiene.

Keywords: super dental floss, oral hygiene, fixed orthodontic appliance. (J Bagh Coll Dentistry 2011;23(3): 109-111).

INTRODUCTION

The dental plaque seems to occur when the balance between the microorganisms and the host is disturbed in some way and this related to the possible number of virulence factors (1). Orthodontic therapy may affect the periodontium by favoring plaque retention and food debris resulting in gingivitis, by directly injuring the gingiva as a result of over extended bands, and by creating excessive and/or unfavorable forces on supporting tooth structures(2). Also it’s particularly difficult to maintain an acceptable hygiene when bands, wires and ligatures are involved (3).

The past two decades have seen greater focus on dento facial esthetics in the population with an increasing demand for orthodontic treatment. (4). Maintaining good oral hygiene is a challenge for anyone but particularly for orthodontic patients (5), because of increase in surfaces of teeth and the in accessibility of some areas of fixed appliance which make plaque removal more difficult (6). It has been clear that the orthodontic appliances contribute to plaque retention and interfere with the performance of good oral hygiene (7).

Clinical and experimental studies have demonstrated that the most important etiological factor in the inflammatory periodontal diseases is the presence of bacterial plaque at the level or below the level of gingival margin.

The introduction of fixed orthodontic appliances into the mouth increases the number of areas for potential plaque retention, and thus it will increase the possibility of progressing from a gingivitis to a periodontitis (8). Personal oral hygiene is difficult to perform when fixed orthodontic appliances are in place (9,10). Previous studies showed that the placement of orthodontic appliance in the oral cavity might result in iatrogenic side effects (11,12). The appliance increase the volume of dental plaque and number of bacteria and their by product may cause higher incidence in gingival inflammation (12). Recent clinical studies indicate that the careful plaque control prevent dental caries, the retention of food influence by arch wires in fixed appliance and the roughness of acrylic in removable appliances (13,14).

The aim of this study is to evaluate the changes in the quantity of plaque in patients using fixed orthodontic appliances by using of super dental floss.

MATERIALS AND METHODS

The study sample is comprised of 16 patients wearing fixed orthodontic appliance (7 males and 9 females); with an age range 15–22 years at the start of orthodontic treatment. They are randomly selected in private clinic without regard to the type of malocclusion. No sex discrimination is included in this study. The exclusion criteria include the following, no mouth breathing, no tongue or digit habits, had no abnormal hard or soft tissue morphology, systemic disease or a
course of antibiotic therapy within the preceding one month.

All patients were treated with fixed orthodontic appliances. Bands were cemented with orthophosphate cement to upper and lower first molar teeth and rest of teeth were bonded with composite resin (Alfadent chemical cure com-posite resin, ADA) according to manufacturer’s instruction.

Oral Hygiene Instruction

Two weeks before appliance construction, patients and their parents were instructed in conventional oral hygiene using modified Bass technique. We select the patients who use only tooth brushing (mechanical) way for oral hygiene without any adjuvant as chlorhexidine gluconate mouth wash (chemical), fluoride rinses or gels before or during the study, to exclude their influence on the quantity of plaque. Beside the tooth brushing the patient instructed to use super dental floss once daily after they wear the fixed appliance.

Assessment of Oral Hygiene

The quantity of plaque were evaluated after one week when patients wear orthodontic appliance then another recording was done after one week instruction of using super dental floss, figure 1 show the super dental floss. By using disclosing tablets we account the quantity of plaque. We assessed 12 anterior teeth in each patient (6 in each jaw) by using score from 0-3 as shown in table 1

Evaluation of super dental floss benefit was performed according to the criteria of it is properties (oral B laboratories):
Stiffened end to floss under appliances.
Spongy-floss to clean around appliances.
Regular floss to remove plaque under gingival line as in figure 1

RESULTS

Tables 2 and 3 show the sample description, the percentage of scores and numbers of teeth involved in each scores .

Four teeth from 192 one represent 0 score and 34, 111, 43 teeth represent score 1,2,3 respectively before suing super dental floss while 143, 37,12, 0 represent number of teeth in score 0, 1, 2, 3 respectively after flossing (table 2).

When the t-test was applied to test significant between plaque quantity before and after using super floss, highly significant differences were noted, table (4).

**Table 1: The method of scoring, four scores are used from 0-3.**

<table>
<thead>
<tr>
<th>Score</th>
<th>Represent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No plaque</td>
</tr>
<tr>
<td>1</td>
<td>Plaque at gingival margin or orthodontic bracket (thin layer)</td>
</tr>
<tr>
<td>2</td>
<td>Plaque at two area orthodontic bracket and gingival margin</td>
</tr>
<tr>
<td>3</td>
<td>Plaque at obvious amount in the area between orthodontic bracket and gingiva margin</td>
</tr>
</tbody>
</table>

**Table 2: number of teeth in each scores before and after flossing**

<table>
<thead>
<tr>
<th>Score</th>
<th>No. of teeth Before flossing</th>
<th>No. of teeth After flossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
<td>143</td>
</tr>
<tr>
<td>1</td>
<td>34</td>
<td>37</td>
</tr>
<tr>
<td>2</td>
<td>111</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>43</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 3: percentage of teeth according to different scores before and after flossing**

<table>
<thead>
<tr>
<th>Score</th>
<th>Before flossing</th>
<th>After flossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2.083</td>
<td>74.479</td>
</tr>
<tr>
<td>1</td>
<td>17.708</td>
<td>19.270</td>
</tr>
<tr>
<td>2</td>
<td>75.812</td>
<td>6.250</td>
</tr>
<tr>
<td>3</td>
<td>22.395</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 4: comparison of mean before and after flossing**

<table>
<thead>
<tr>
<th>Before flossing</th>
<th>After flossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.0058</td>
</tr>
<tr>
<td>Std. deviation</td>
<td>0.19260</td>
</tr>
<tr>
<td>p</td>
<td>0.000</td>
</tr>
<tr>
<td>t value</td>
<td>7.461</td>
</tr>
<tr>
<td>P &lt; 0.0001</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

Many features of oral hygiene have been studied in the literature. The studied patients were received enormous instructions for oral hygiene performance between and during the treatment course to give opportunity for continuous motivation throughout the treatment course.

The increase in the amount of plaque after placement of orthodontic appliance was a result of impaired access to the tooth surfaces with the tooth brush, so that the effectiveness of plaque removal procedures is impaired. Also manual brushing has a limited effect interproximally; interdental cleaning remains a problem in orthodontics. The use of single tufted brushes, dental floss, tooth picks, or other devices demands excellent patient cooperation and is difficult to perform adequately on a long term basis. During orthodontic treatment with fixed appliances the effectiveness of plaque removal procedures is impaired. This can enhance the risk...
for the development of tooth caries and gingival inflammation. Furthermore, it has been previously reported that a slight loss of periodontal support can be observed following orthodontic treatment with fixed appliances (16). Recognizing these risks the orthodontist must make a great effort to educate patients as regards proper dietary and oral hygiene habits in an attempt to minimize detrimental effects on the teeth and periodontal tissues during orthodontic treatment (17).

During flossing technique practicing and with the continuous motivation, the patient’s discomfort had already been overcome, and the proper flossing became the main aim for the patients. The patients tried the best to practice proper oral hygiene and make the oral hygiene parameters decreased markedly even from the baseline records. On the other hand, this may be due to the superiority of the super floss technique in orthodontic appliance (18). Also the pressure subjected by the floss bristles on the gingival area made a massaging affect on the gingival. Upon patients’ instructions, the patients agreed with the effectiveness of using super dental floss for cleaning bracket (19).

Within the limits of this study it is possible to conclude that there was significant effect by using super dental floss in patients wear orthodontics appliance and decrease the quantity of plaque.

REFERENCES