The prevalence of root exposure and its relation to mechanical tooth cleaning procedures

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ABSTRACT

Background: Tooth root Exposure is the denudation of the tooth root surface due to apical movement of the gingiva & is a common clinical finding in adults. Prevalence of tooth root exposure related to mechanical oral hygiene procedures was recorded and correlated to tooth brushing.

Materials and methods: 550 patients were involved in this study. Their ages range from 20 to 59 years. Root exposure measurements & Oral hygiene status were examined.

Results: 31.47% of the cases exhibited root exposure of 0.5 mm or greater. The occurrence of root exposure was found to vary from 20.39% of all subjects in the (20-29 years) age group to 40.6% of the subjects in the (50-59 age group. Root exposure increased in both numerical occurrence and linear dimensions with age. Males showed greater exposure than females of the same age group; also exposure occurred most often on facial surfaces of maxillary cuspids and bicuspids. Individuals with good oral hygiene showed greater exposure than those with poor oral hygiene.

Conclusions: The possibility of developing such lesions in gingiva should not prevent dental professionals from recommending the mechanical method of supragingival plaque control measures (tooth brushing & interdental cleaning aids) by the proper instruction of the right technique of brushing that may not induce or increase an existing recession.

Key words: Gingival recession, prevalence. J Bagh Coll Dentistry 2010; 22(1):62-64.

INTRODUCTION

Exposure of tooth root is defined as the denudation of the tooth root surface due to apical movement of the gingiva(1). It is a common clinical finding in adults. Gingival lesions possibly caused by tooth brushing may be classified in terms of three groups: lacerations, gingival recession and hyperplasia.

Laceration or ulceration of the gingival tissues is usually recognized as an acute mechanical trauma, whereas gingival recession and hyperplasia are thought to be characteristics of chronic lesions (1). A classification of gingival recession according to the depth and width of gingival sulcus has been suggested by Sullivan & Atkins (2).

Morphologically, the gingiva may show a clefs (Stillman’s clef), festoon-like thickening of the marginal gingival (McCall’s festoon), and simple retraction exposing the root surfaces (3).

It has been suggested that tooth-brushing lesions on the gingiva are usually restricted to the facial aspects of the dental arch, and are more pronounced on the left side of the mouth (4).

Furthermore, the lesions seem to develop more rapidly in the areas of cusps and the premolars, and the gingival covering of buccally malaligned teeth than that in a lingual position.

Gorman stated that, mal positioned teeth and tooth brushing trauma were the frequent etiologic factors of gingival recession(5).

Sangues & Gjerom(6) have reported the frequency of different types of traumatic lesions in gingival tissues. Kitchen (7) described the prevalence of tooth root exposure in different age groups.

Since mechanical oral hygiene is emphasized in modern preventive dentistry, so new and comprehensive epidemiological studies on these topics are needed, and data of gingival traumatism caused by oral hygiene procedures are limited (6).

The purpose of the present investigation was to study the prevalence of tooth root exposure among patients attending the Oral Diagnosis Clinic, College of Dentistry, and Baghdad University.

MATERIALS & METHODS

Five hundred and fifty patients attending Periodontic Dept. College of Dentistry, Baghdad University during the years 2004, 2005, 2006 were involved in this study. Their ages range from 20 to 59 years (Table 1). At least 4 teeth in each quadrant should be present.

Table 1:Distribution of the subject materials according to age.

<table>
<thead>
<tr>
<th>Age group (Yr.)</th>
<th>Male (No.)</th>
<th>Female (No.)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>70</td>
<td>64</td>
<td>134</td>
</tr>
<tr>
<td>30-39</td>
<td>76</td>
<td>69</td>
<td>145</td>
</tr>
<tr>
<td>40-49</td>
<td>60</td>
<td>65</td>
<td>125</td>
</tr>
<tr>
<td>50-59</td>
<td>89</td>
<td>57</td>
<td>146</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>295</strong></td>
<td><strong>255</strong></td>
<td><strong>550</strong></td>
</tr>
</tbody>
</table>

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Root exposure measurements:
Visible root exposure measurements from the cemento-enamel junction to the gingival margin for tooth at midlabial or midbuccal aspects. The measuring was done with a graduated perioprope and as follow:
A. free from exposure.
B. 0.5 mm exposure.
C. 1 mm exposure.
D. 1.5 mm exposure.
E. 2 mm exposure.
F. 2.5 mm exposure.
G. 3 mm exposure.
H. more than 3 mm exposure.

Recessions in areas with a history of previous periodontal surgery were excluded. The clinical recordings were performed by a well-trained periodontist.

Oral hygiene
The subjects were graded on the oral hygienic basis into three: Poor, fair and good oral hygiene, depending on the amount of dental plaque, calculus debris and the condition of the gingiva. The information concerning each patient were gathered on a mimeograph from which it includes: patient name, age, sex, educational level, use of tooth brush, frequency of tooth brushing per day, medical history and the location of recession on the teeth.

RESULTS
Age groups: (Table 2)
20-29: 134 patients (64 females and 70 males) which had a total of 2424 teeth present were examined. Only 499 teeth showed visible tooth root exposure, which was found largely of 0.5 mm type with some instance of 1 mm, but very little in excess of that figure. The prevalence of the cervical exposure was 20.39%. Clinically visible root exposure was found more frequently on facial surfaces of maxillary cuspids and bicuspids.

30-39: 145 patients with a total of 2766 teeth were examined, the teeth that showed exposure were 768 and the prevalence was equal 27.5%. The most pronounced increase of exposure sites was from the 20-29 to the 30-39 age groups and this was especially true for males. Tooth root exposure was found more frequently on the maxillary facial surfaces of the cuspsids and bicuspids (Table 3). Males in this age group had a greater frequency and extend of exposure than females (Table 4).

40-49: 125 patients, the prevalence of root exposure in this age group was found to be equal to 35.3% (Table 2). Gingival retraction was found more frequently on the maxillary cuspids and bicuspide on the facial tooth surfaces (Table 3). Males showed greater frequency and extent of exposure (Table 4).

50-59: 146 patients of a total of a 1505 teeth examined in this age group, 642 teeth exhibited root exposure with a prevalence of 42.6%, which means that the highest prevalence of tooth root exposure was found in this age group (Table 3). If we consider the average percentage of teeth that are free from any exposure in this group, we found that only 39.8% in males and 46.1% in females, which means that this group showed similar sex differences but to a lesser degree (Table 4).

The number of examined patients was 247 with fair oral hygiene, 119 of poor oral hygiene and 158 with good oral hygiene. 6 patients were not classified. The oral hygiene level was better in males than that in females in general.

Table 2: Distribution of subjects with root exposure related to tooth brushing in both sexes and in different age groups

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
<th>Total No. of teeth</th>
<th>Exposure</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>1505</td>
<td>950</td>
<td>425</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>30-39</td>
<td>125</td>
<td>100</td>
<td>225</td>
<td>225</td>
<td>225</td>
<td>225</td>
</tr>
<tr>
<td>40-49</td>
<td>100</td>
<td>80</td>
<td>180</td>
<td>180</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>50-59</td>
<td>75</td>
<td>50</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>Total</td>
<td>235</td>
<td>175</td>
<td>410</td>
<td>410</td>
<td>410</td>
<td>410</td>
</tr>
</tbody>
</table>

Table 3: Distribution of root exposure.

<table>
<thead>
<tr>
<th>Number of teeth With visible root exposure</th>
<th>Maxilla</th>
<th>Mandible</th>
<th>Incisor</th>
<th>Cuspids &amp; Bicuspid</th>
<th>Molar</th>
<th>Facial</th>
<th>Lingual</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>1988</td>
<td>961</td>
<td>227</td>
<td>1577</td>
<td>645</td>
<td>2425</td>
<td>28</td>
</tr>
<tr>
<td>30-39</td>
<td>1462</td>
<td>905</td>
<td>333</td>
<td>1049</td>
<td>881</td>
<td>2766</td>
<td>0</td>
</tr>
<tr>
<td>40-49</td>
<td>1147</td>
<td>993</td>
<td>555</td>
<td>1133</td>
<td>497</td>
<td>1981</td>
<td>154</td>
</tr>
<tr>
<td>50-59</td>
<td>758</td>
<td>748</td>
<td>417</td>
<td>698</td>
<td>390</td>
<td>1357</td>
<td>148</td>
</tr>
</tbody>
</table>

Table 4: Average percentage of all teeth free from any cervical exposure.

<table>
<thead>
<tr>
<th>Age groups</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>181%</td>
<td>150%</td>
</tr>
<tr>
<td>30-39</td>
<td>173%</td>
<td>156%</td>
</tr>
<tr>
<td>40-49</td>
<td>190%</td>
<td>163%</td>
</tr>
<tr>
<td>50-59</td>
<td>198%</td>
<td>185%</td>
</tr>
</tbody>
</table>

DISCUSSION
From the total of 8830 teeth examined 2663 or 32% showed root exposure of 0.5 mm or greater. The individuals of all age groups had varying degree of root exposure, this involvement ranged form 20.39% in the first age group (20-29yr.) to 42.6% in the 50-59 yr age group. These findings agree generally with the results of Kitchen (7) and Gorman (3) .
Kitchen also reported that females showed less exposure than males within the same age groups. We found the same result except in 1 age group (40-49 years). Gorman showed that gingival recession increased with almost arithmetical progression with age and it was slightly greater in males.

The average of gingival recession increased from 0.97 mm in the 16-25 yr. age group to 1.4 mm in the 46-86 yr. age group. In females the average midline recession increased from 0.8 mm in the youngest age group. The corresponding average increases in the males were from 1 mm to 1.5 mm.

Although, the effect of oral hygiene were not fully assessed in this study, subjects with good oral hygiene showed greater overall exposure than those with poor oral hygiene.

The recording of the oral hygiene as good did not necessarily imply that tooth brushing technique were sound (5). Number of times that the patient brushes his/her teeth and the gingiva daily, was considered less important to oral cleaning than the manner (technique) in which it was achieved.

Besides better oral hygiene was found in male group and such a finding is in agreement with the observation of Sangues & Gjermo (6). Another finding in this study showed that root exposure occurred most often on the maxillary teeth (56%), cuspids and bicuspids (56%) and facial tooth surfaces (97%). These findings were in agreement with those carried by many authors, like Gorman (3), Olery et al. (8) and Kitchen (7).

The majority of subjects with cervical root exposure in this study were not aware of the condition, and only few of them suffered from sensitivity, this indicates that traumatism related to tooth brushing procedures constitute only minor clinical problems.

The possibility of developing such lesions in gingiva should not prevent dental professionals from recommending the mechanical method of supr Angloval plaque control measures (tooth brushing & inter dental cleaning aids) on the other methods (5). This can be best achieved by the proper instruction on the right technique of brushing that may not induce or increase an existing recession.

However, researches on the specific etiological factors involved in the development of various lesions on the gingiva are desirable in order to reduce their frequency and to minimize its severity.

REFERENCES