Assessment of Thickness of Attached Gingiva in Different Age Groups

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Abstract

Attached gingiva is an important anatomic and functional landmark and the mucogingival junction is used to determine the width of attached gingiva. In this study width of attached gingiva was determined in different age group individuals mid buccally. Materials and methods: 45 subjects were included in the study and divided into three age groups: 16-30 years, 31-45 years and 45- 60 years. The width of the gingival was assessed visually by William's graduated probe. Results: It was observed that the width of attached gingiva increases with age. It was also observed that width of attached gingiva also varies in different tooth regions. Conclusion: It was concluded from the present study that width of attached gingiva increases with age and varies in different regions of mouth.

Keywords: Attached gingiva, mucogingival junction, keratinized tissue.

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INTRODUCTION

Oral cavity is lined by masticatory mucosa covering the hard palate and gingiva of alveolar process, lining mucosa covering the lips, cheeks and vestibular fornix and specialized mucosa covering the dorsum of tongue [1]. Macroscopically, the gingiva is divided into marginal, attached, and interdental areas [2]. Attached gingiva is the part of keratinized gingiva that aids in stabilization of gingival margin against frictional forces, increases resistance to external injury and dissipates physiological forces exerted by the muscular fibers of the alveolar mucosa on the gingival tissues [1].

Orban first described the term attached gingiva as that part of the gingiva that is firmly attached to the underlying tooth and bone and is stippled on the surface [3]. The attached gingiva extends to relatively loose and movable alveolar mucosa on facial aspect and is demarcated by mucogingival junction. On the palatal aspect it blends imperceptibly with firm and resilient palatal mucosa in maxillary arch and in mandible on lingual aspect it terminates at the junction of lingual alveolar mucosa that is continuous with mucous membrane lining the floor of the mouth [1].

For many years the presence of an “adequate” zone of gingiva was considered critical for the maintenance of marginal tissue health & for the prevention of continuous loss of connective tissue attachment [4, 5]. The role of the attached gingival width in maintaining periodontal health has been investigated in adults. It has been observed that in the absence, or following the removal, of the attached gingiva the remaining tissue (alveolar mucosa) will curl and will not respond to treatment [6]. Lang and Loe suggested that a minimum of 2 mm of keratinized tissue, 1 mm of which was attached was necessary [7]. Few authors have reported that the tissue could remain clinically healthy with <1 mm of attached gingiva [8-11]. Thus adequate width restoration of attached gingiva is an important part of the periodontal plastic and esthetic surgery [12].

According to Hall, the width of attached gingiva is determined by subtracting the sulcus or pocket depth from total width of gingiva [13]. So the width of the attached gingiva is the distance between the mucogingival junction and the projection on the external surface of the bottom of the gingival sulcus or periodontal pocket [2].

The position of mucogingival junction is genetically determined which serves as an important clinical landmark [14] for the assessment of the width of attached gingiva. The mucogingival junction maintains a constant distance from the base of the mandible in the lower jaw and from the anterior nasal spine in the
maxilla. It is a discrete line that helps in distinguishing the movable and immovable mucosa during passive motion of the lips and cheek [15].

Assessing the width of the attached gingival will help in assessing the risk for a periodontium to be affected by disease for which normal values need be known for that population [16]. Thus the purpose of this study was to assess the mid-buccal width of attached gingiva in individuals of different age groups.

**MATERIALS AND METHODS**
A total of 45 patients comprising of both sexes visiting the outpatient Department of Periodontology of Government Dental College and Hospital, Srinagar were considered for the present study after meeting the inclusion and exclusion criteria. The inclusion criteria for this study included patients with good general health till 60 years of age, healthy gingival tissues with no attachment loss and not undergone any sort of periodontal treatment for last 6 months. The pregnant and lactating females, systemic illness and subjects taking medications that may have an influence on the gingiva were excluded from the study.

**Method**
Alter being informed about the study protocol those patients who agreed for the study, were included in the study. The subjects were grouped into three groups based on their age
- 16-30 years
- 31-45 years
- 46-60 years

The examination was carried by a single examiner to eliminate probing discrepancies on all the teeth in mid-buccal area for easy assessibility. The width of keratinized gingiva was measured as the distance from the gingival margin to the mucogingival junction. Using a William’s periodontal probe sulcus depth was measured from the gingival margin to base of the sulcus. Then using these values, the attached gingival width was assessed as the difference of the sulcus depth from the width of the keratinized tissue. All the data collected were subjected to statistical analysis.

**RESULTS**
The assessment of width of attached gingiva in different age groups revealed that the width of gingiva increased with age where in the mean width in 16-30 years was 2.33 mm, which increased to 2.43 mm in 31-45 years and 2.64 mm in 46-60 years of different age groups (table 1).

Table 2 showed the thickness in various tooth regions with maxillary incisors having the greatest width with an average of 3.42 mm and mandibular molars with the least width, at an average of 1.72 mm, while mandibular incisors had an average width of 3.16 mm, maxillary premolars 2.08 mm, mandibular premolars of 1.90 mm and maxillary molars of 2.05 mm.

**DISCUSSION**
The width of attached gingiva is vital in assessing the risk of periodontium being affected by disease. The mucogingival junction being genetically determined having constant position throughout the life serves as an important anatomical landmark, thus helping in assessment of width of attached gingiva. The mucogingival junction can be demarcated by various methods including visual method, functional method and visual method after histochemical staining.

<table>
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<th>Table-1: Width of attached gingiva in different age group</th>
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<td>Age group</td>
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<td>16-30 years</td>
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<td>31-45 years</td>
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<td>46-60 years</td>
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<th>Table-2: Width of Attached gingiva among different types of tooth</th>
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<td>Arch</td>
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In this study for easy accessibility and convenience mid-buccal region of each tooth was chosen and probing was done using William’s periodontal probe by single examiner to eliminate probing discrepancies that may alter the results.

There are very studies done on the width of attached gingiva. One of the most often study quoted on width is by Bowers [8] in 1963 and Ainamo [17] in 1976. The present study measured attached gingiva with...
In this present study, the width of attached gingiva increased with age as suggested by authors like Ainamo[18] and Vincent et al.[22]. In this study, the widest zone of attached gingiva was found in the maxillary incisors and the least in the mandibular molar region similar to the studies of Chandulal et al. [16], and Shaju and Zade [23].

The width of attached gingiva varies in different areas of the mouth and have been given a range of 1-9 mm according to Bowers [8], 1-4 mm according to Shaju and Zade [23] and 0-5mm by Chandulal et al. [16] and Subbaiah [25]. In the present study, the range of the mean width of attached gingiva varied between 1 mm to 4 mm. The dissimilar results being obtained may partially be due to different tooth and site selection.

CONCLUSION

In this study the assessment of full mouth mid-buccal width of attached gingiva suggested that there is increase in width with age. Maximum width seen in maxillary incisors and least width seen in mandibular molars.

REFERENCES