

## Assessment of Thickness of Attached Gingiva in Different Age Groups

Dr. Rashidat-ul-Khairat<sup>1\*</sup>, Dr. Suhail Majid Jan<sup>2</sup>, Dr. Abhima Kumar<sup>3</sup>, Dr. Roobal Behal<sup>4</sup>, Dr. Beanish Bashir<sup>5</sup>

<sup>1</sup>MDS, Department of Periodontics, GDC, Srinagar Jammu and Kashmir, India

<sup>2</sup>Professor and HOD, Department of Periodontics, GDC, Srinagar Jammu and Kashmir, India

<sup>3</sup>MDS, Department of Periodontics, GDC, Srinagar Jammu and Kashmir, India

<sup>4</sup>Associate Professor, Department of Periodontics, GDC, Srinagar Jammu and Kashmir, India

<sup>5</sup>MDS, Department of Periodontics, GDC, Srinagar Jammu and Kashmir, India

\*Corresponding author: Dr. Rashidat-ul-Khairat | Received: 02.03.2019 | Accepted: 15.03.2019 | Published: 30.03.2019  
DOI: 10.36347/sjds.2019.v06i03.008

### Abstract

### Original Research Article

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.

**Copyright © 2019:** This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

## 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 gingiva 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

After 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-1: Width of attached gingiva in different age group**

Age group	N	Mean Width (Mm)
16-30 years	15	2.33
31-45 years	15	2.43
46-60 years	15	2.64

**Table-2: Width of Attached gingiva among different types of tooth**

Arch	Tooth Type	Mean (mm)
Maxillary	Incisors	3.42
	Premolars	2.08
	Molars	2.05
Mandibular	Incisors	3.16
	Premolars	1.90
	Molars	1.72

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

the help of a periodontal probe similar to Tenenbaum[18] while Talari[19] Ainamo [20] and Saario [21] used Schiller's iodine solution and orthopantomograms to measure the width.

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

- Malhi K. Attached Gingiva: A Review. IJSRR. 2013; 3(2), 188-198
- Fiorellini JP, Kim DM, Ishikawa SO. The gingiva. In: Newman MG, Takei H, Klokkevoeld PR, Carranza FA, editors. Carranza's Clinical Periodontology. 10th ed. Missouri: Saunders Publishers; 2006.p. 46-7.
- Orban B. Clinical and histologic study of the surface characteristics of the gingiva. Oral Surg Oral Med Oral Pathol. 1948;1:827-41.
- Ainamo J, Löe H. Anatomical characteristics of gingiva. A clinical and microscopic study of the free and attached gingiva. The Journal of Periodontology. 1966 Jan;37(1):5-13.
- Carnio J, Camargo PM, Passanezi E. Increasing the apico-coronal dimension of attached gingiva using the modified apically repositioned flap technique: A case series with a 6-month follow-up. Journal of periodontology. 2007 Sep;78(9):1825-30.
- Goldman HM. Periodontia. 3rd ed. St. Louis, Mo. C.V. Mosby Co. 1953.
- Lang NP, Löe H. The relationship between the width of keratinized gingiva and gingival health. J Periodontol. 1972;43:623-7.
- Bowers GM. A study of the width of attached gingiva. J Periodontol. 1963;34:201-9.
- Miyasato M, Crigger M, Egelberg J. Gingival condition in areas of minimal and appreciable width of keratinized gingiva. J Clin Periodontol. 1977;4:200-9.
- Dorfman HS, Kennedy JE, Bird WC. Longitudinal evaluation of free autogenous gingival grafts. J Clin Periodontol. 1980;7:316-24.
- de Trey E, Bernimoulin JP. Influence of free gingival grafts on the health of the marginal gingiva. J Clin Periodontol. 1980;7:381-93.
- Kolte R, Kolte A, Mahajan A. Assessment of gingival thickness with regards to age, gender and arch location. Journal of Indian Society of Periodontology. 2014 Jul;18(4):478.
- Hall WB. Can attached gingiva be increased nonsurgically?. Quintessence international, dental digest. 1982 Apr;13(4):455.
- Wennström JL, Zucchelli G, Pini Prato GP. Mucogingival therapy-periodontal plastic surgery. Clinical periodontology and implant dentistry. 2003;4:576-650.
- Hilming F, Jervoe P. Surgical extension of vestibular depth. On the results in various regions of the mouth in periodontal patients. Tandlaegebladet. 1970 Mar;74(3):329-43.
- Chandulal D, Jayshri W, Bansal N. Measurement of the width of attached gingiva in an Indian subpopulation. Indian J Dent Adv. 2016 Jan 1;8(1):14-7.
- Ainamo J, Talari A. The increase with age of the width of attached gingiva. Journal of Periodontal research. 1976 Aug;11(4):182-8.
- Tenenbaum H, Tenenbaum M. A clinical study of the width of the attached gingiva in the deciduous, transitional and permanent dentitions. Journal of clinical periodontology. 1986 Apr;13(4):270-5.
- Talari A, Ainamo J. Orthopantomographic assessment of the width of attached gingiva. J Periodontal Res. 1976; 11(4):177-81
- Ainamo A, Ainamo J. The width of attached gingiva on supraerupted teeth. J Periodontal Res. 1978; 13(3):194-98.
- Saario M, Ainamo A, Mattila K, Suomalainen K, Ainamo J. The width of radiologically-defined attached gingiva over deciduous teeth. J Clin Periodontology. 1995; 22(12):895-98.
- Vincent JW, Machen JB, Levin MP. Assessment of attached gingiva using the tension test and clinical measurements. Journal of periodontology. 1976 Jul;47(7):412-4.
- Shaju JP, Zade RM. Width of attached gingiva in an Indian population: A descriptive study 2009. Bangladesh J Med Sci. 2009;8:64-7.
- Subbaiah R, Manohar B. Assessment of the width of attached gingiva in different regions of the mouth in an Indian subpopulation. J Indian Dent Assoc. 2012;6:96-8.