

Attached Gingiva Then And Now....????



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Introduction:

For many years the presence of adequate gingiva was considered critical for maintenance of marginal tissue health and prevent continuous loss of connective tissue attachment. Clinicians had the idea that sites with narrow zone were often inflamed while the wide zone of gingiva found at neighboring teeth remained healthy. One of the requirements of comprehensive periodontal therapy is the evaluation of width of attached gingiva. This prompted the clinicians to ask what the significance of attached gingiva was, how much can be considered adequate and what clinical relevance these considerations had. It has been claimed that a certain width of attached gingiva is required to maintain gingival health i.e proper mucogingival environment and to prevent gingival recession and attachment loss.¹

Definition²

It is the distance between the mucogingival junction and the projection on the external surface of the bottom of the gingival sulcus or the periodontal pocket.

Functions Of Attached Gingiva¹

- Gives support to marginal gingiva
- Help to withstand the functional stresses of mastication & tooth brushing.
- Provide attachment or a solid base for the movable alveolar mucosa for the action of the cheeks, lips, and tongue.

Factors Affecting Width Of Attached Gingiva¹

- High frenum attachment
- Recurrent inflammation
- Recession
- Malpositioned teeth
- Osseous dehiscence

It is generally greatest in the incisor region; 3.5 to 4.5mm in the maxilla and 3.3- 3.9mm in mandible. The least width is in the 1st premolar area; 1.9mm in the maxilla and 1.8mm in mandible.²

Assessment Of Width Of Attached Gingiva

- ☐ Functionally by passive movement of lips and cheeks (Ochsenbein et al 1974, Cohen 1964)⁶
- ☐ Measure the amount of attached gingiva using probe (subtraction method)²
- ☐ Staining method³
- ☐ Roll method³
- ☐ OPG assessment ((Talari and Ainamo 1977)⁵
- ☐ Anaesthesia method³

Thickness Of Attached Gingiva

It is said that Gingiva is significantly thicker in the younger age group than the older age group, females exhibited thinner gingiva as compared to males and the gingiva is thicker in the mandibular area as compared with the maxillary arch. (Goasland et al 1977)¹²

The clinical impression of a more pronounced inflammatory reaction upon plaque accumulation at sites characterized by a lack of attached gingiva turned out histologically to be mainly due to thinner tissue and a concomitantly thinner keratin layer of the epithelium [Wennstrom, Lindhe 1983]¹⁴. Moreover gingival thickness appears to play an important role in wound healing as well as flap management during regenerative and perioplastic surgery. (Andereg et al 1995)¹⁵.

Measurement of thickness of attached gingiva

1. Transgingival probing
2. Ultrasonic measurements (HP Muller 1996)¹¹

Width of attached gingiva for maintenance of periodontal health. How much is adequate...???

The concept which earlier prevailed was that a narrow zone of gingiva was insufficient to protect the periodontium from injury caused by frictional forces encountered during mastication and to dissipate the pull on the gingival margin created by the muscles of the adjacent alveolar mucosa [Friedman et al 1957]. It was believed that an "inadequate" zone of gingiva would facilitate subgingival plaque formation because of

improper pocket closure resulting from the mobility of the marginal tissue [Friedman 1962] and favour attachment loss and soft tissue recession because of less tissue resistance to apical spread of plaque associated gingival lesion [Stern et al 1976].¹

There were many studies which were put forward, regarding as to how much of attached gingiva is considered adequate for the maintenance of periodontal health, few of them are;⁴

Study	Design of study	Outcome	Conclusion and implication
Lang and Loe (1972)	32 dental students dental underwent 6 weeks of supervised oral hygiene, width of and keratinized gingiva, gingival index and gingival exudate were scored around plaque free sites	Sites with <2mm keratinized gingiva had higher percentage of sites with clinical inflammation and gingival exudate	2mm of keratinized gingiva is adequate to maintain gingival health
Miyasato et al (1977)	Gingival status of 16 dental personal with adequate attached gingiva and minimal attached gingiva was compared in 6 subjects having contralateral sites with inadequate and adequate attached gingiva following a period of 25 days of no oral hygiene at sites	i) No marked difference in gingival index in subjects with minimal attached or adequate attached gingiva ii) Following a period of no oral hygiene there was no significant difference in gingival index and plaque scores in areas with narrow or wide attached gingiva	It is possible to achieve gingival health even in the absence of adequate attached gingiva

In the end it was concluded that Gingival health can be maintained independent of its dimensions. The evidence from both clinical and experimental studies show that, in the presence of plaque areas with a narrow zone of gingiva possess the same resistance to continuous attachment loss as teeth with a wide zone of gingiva. Hence the traditional dogma of the need of an adequate width of gingiva, or attached portion of gingiva, for prevention of attachment loss is not scientifically supported.¹

Increase in width of attached gingiva with Age and Supraerupted teeth.^{7,8}

The measured anatomical width of attached gingiva it increases significantly with age. The MGJ remains at a probably genetically predetermined location while teeth move in an occlusal direction through adult life. In the absence of concurrent retraction of the gingival margin this results in an increase of the width of AG with advancing age. (Ainamo and Tilar 1977)

The anatomical width of AG is directly proportional to the amount of past tooth eruption. (Ainamo and Ainamo (1977)

Attached gingiva in Pediatric Dentistry⁹

It has been said that immediately upon eruption, permanent teeth do not have any attached gingiva since the sulcus depth exceeds the width of keratinized gingiva. It has also been reported that an inadequate width of attached gingiva will correct by itself from 6 to 12 years of age without interference by means of periodontal surgery. (Bimstein et al 1988, Sarrio et al 1995)

Width of Attached Gingiva and Recession⁴

Evidence from prospective longitudinal studies shows

that the gingival height is not a critical factor for the prevention of marginal tissue recession, but that the development of a recession will result in loss of gingival height. The volume of gingival connective tissue has greater significance than width in determining the susceptibility to recession.

Attached Gingiva in Orthodontic therapy⁴

The clinical implications of various studies said that if orthodontic movement is predicted to be within bony alveolus and the patient maintains adequate plaque control, no gingival augmentation is indicated, however if this movement causes dehiscence then evaluation of gingival thickness should be done. Gingival augmentation is indicated prior to orthodontic tooth movement if the tissue is thin to prevent unpredictable attachment loss but if the tissue is thick then one may choose to re-evaluate the need for augmentation after orthodontic treatment is complete. (Payal Mehta et al)

Width of attached gingiva and dental implants⁴

The theory that certain amount of attached gingiva around implants have various reasons (Glick and Co-workers 1997).

- Attached gingiva helps to maintain patient comfort and resistance to mechanical trauma during oral hygiene procedures
- A non keratinized epithelium may not be able to form a functional junctional epithelium
- The alveolar mucosa due to its elastic movement nature would under functional movement constantly challenge the epithelial seal around implants
- Tissue prolapse can occur while attacking or

removing prosthetic components

The report from 6th European workshop on periodontology and Cochrane review 2007 concluded that:

- Scientific evidence is lacking but augmentation around implants may be indicated in certain situations.
- The prognosis of an endosseous implant with a narrow or absent width of attached gingiva is good.
- Peri-implant health can be maintained if oral hygiene is good.

Attached gingiva for Prosthetic treatment³

It has been reported that if adequate width & thickness of attached gingiva is present then temporary damage to the gingival tissues following prosthetic & restorative treatment will resolve quickly with little chance of disease progression.

Objectives Accomplished By Widening Of Attached Gingiva¹

1. Enhance plaque removal around the gingival margin.
2. Improves esthetics.
3. Reduces inflammation around restored teeth.

Techniques for Increasing Width Of Attached Gingiva

Physiological: 1. Age 2. Orthodontic tooth movement

Surgical Techniques:

- 1. Free Gingival Auto graft
 - The classic technique
 - Variant technique
 - Accordion technique
 - Strip technique
- 2. Free connective tissue auto grafts
- 3. The Apically Positioned Flap
- 4. Coronal Advancement Flap
- 5. Alloderm Grafts

Conclusion

The need for gingival augmentation has to be tailored according to particular clinical situation and patients oral hygiene competence. Gingival health can be maintained independent of its dimensions. Hence the traditional dogma of the need of an adequate width of gingiva, or attached portion of gingiva, for prevention of attachment loss is not scientifically supported. While current evidence point towards clinical relevance of thickness rather than width of keratinized tissue in determining soft tissue health and recession, the problem arises as it

is more difficult to discern the thickness as compared with measuring the width of attached gingiva. Therefore the clinical impression that one needs a certain adequate width of attached mucosa may not be unfounded.

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