

**The Biologic Width- Importance and Management of Its Violation: A Review**Dr. G. Sailakshmi<sup>1\*</sup>, Dr. V. H. Chalapathi Kumar<sup>2</sup>, Dr. T. Pavan Kumar<sup>3</sup>, Dr. Srinivasa Rao Pottem<sup>4</sup>, Dr. M. Sai Swetha<sup>5</sup><sup>1</sup>Postgraduate student, Department of Prosthodontics, Narayana Dental College and Hospital, Nellore, Andhra Pradesh, India<sup>2</sup>Professor, Department of Prosthodontics, Narayana Dental College and Hospital, Nellore, Andhra Pradesh, India<sup>3</sup>Professor, Department of Prosthodontics, Narayana Dental College and Hospital, Nellore, Andhra Pradesh, India<sup>4</sup>Professor and Head, Department of Prosthodontics, Narayana Dental college and Hospital, Nellore, Andhra Pradesh, India<sup>5</sup>Postgraduate Student, Department of Prosthodontics, Narayana Dental College and Hospital, Nellore, Andhra Pradesh, India**Review Article****\*Corresponding author**

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**Article History**

Received: 16.03.2018

Accepted: 25.03.2018

Published: 30.03.2018

**DOI:**

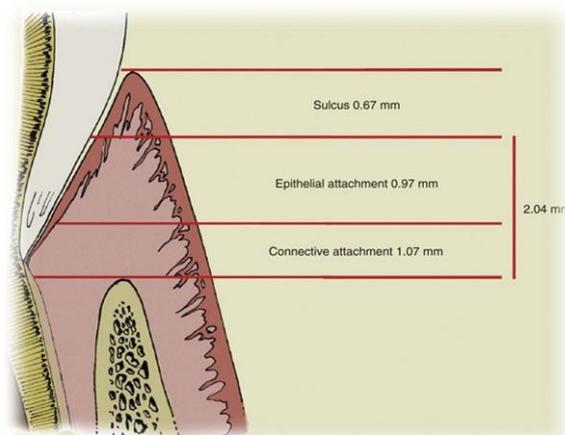
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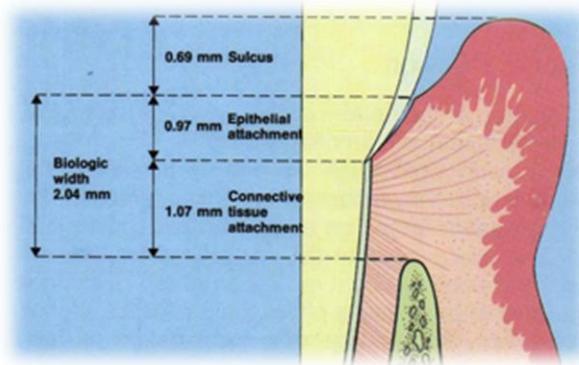
**Abstract:** It is important to know the relationship between periodontal condition and prosthodontic restoration to ensure esthetics, function and comfort to patient. Biologic width plays a key factor in making the periodontal condition healthy. This article discusses about biologic width and its significance, factors causing encroachment of biological width, evaluation and management of violated biologic width.**Keywords:** Dento gingival unit, Finish line placement, Pericision.**INTRODUCTION**

The concept of biologic width plays an important role in maintaining the periodontal health. It protects the underlying alveolar bone by providing a natural seal around tooth from infections and diseases [1]. Biologic width means the space occupied by the junctional epithelium and connective tissue attachment [2, 3]. (Figure 1). Violation of dento gingival unit is common clinical occurrence in subgingival restorations where the restorative margin placement is nearer to alveolar crest rather than supragingival margins [4]. So, the margin placement can affect the biologic width.

**Biologic width concept**

The origin of biologic width concept was first given by Gargiulo, Wentz and Orban. They reported that value of about 2.04mm is necessary for maintenance of alveolar bone and soft tissue health when the restoration or crown has been replaced [3]. (Figure 2). So, while making tooth preparations the restorative margin should not be placed within 2mm of alveolar bone[5]. Its dimensions are variable from tooth to tooth and also from one surface to another[6].

**Fig-1: Biologic width**



**Fig-2: Measured value of biologic width**

According to Kois, biologic width was categorized into 3 types depending on its dimensions.[7, 8] (figure:3)

- Normal crest
- High crest
- Low crest

**Normal crest**

In this type, gingival position is stable and its dimension about 3mm in mid facial and 3-4.5mm proximal surface. So, the finish line should be placed 0.5mm below the gingival margin such that gingival position is maintained in stable position for long time.

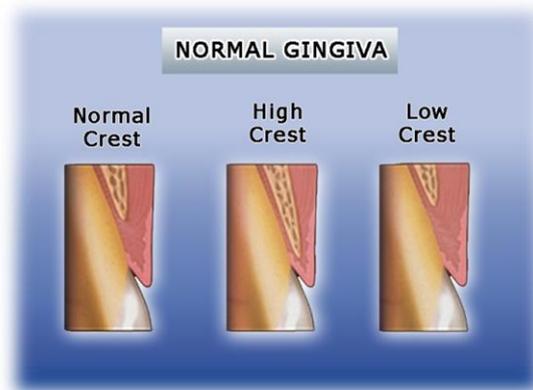
**High crest**

Most commonly seen in proximal aspect adjacent to the missing tooth or teeth region and dimension of biologic width is about less than 3mm in mid facial and proximal regions. So the finish line not to be placed below the gingival level which may cause encroachment of biologic width and chronic inflammation.

**Low crest**

The dimensions are more than 3mm in mid facial and more than 4.5mm proximally. More chance of recession is seen after margin placement subgingivally depending on sulcus depth.

So, as sulcus depth increases, unsupported gingival tissue increases which is unstable and more prone for gingival recession [6].



**Fig-3: shows 3 categories of biologic width**

**Importance of biologic width**

The dimension of the space that the healthy gingival tissue occupies above the alveolar bone is called the biologic width [8]. It is important in case of extensive caries management, sub gingival restorations, crown/root fractures. Biologic width is essential for maintaining the periodontium in healthy state and forms a barrier to protect from irritants which may be harmful to periodontal tissues [6].

**Factors causing encroachment of biological width**

The infringement of the biological width occurs whenever try to reach sound tooth structure – in case of short clinical crowns to increase length of preparation , in case of esthetic demand to hide the margins of restoration[6], old extensive restorations, presence of caries, resorption defects, traumatic injury or tooth fracture at crestal level, Iatrogenic and improper evaluation of sulcus depth. In case of thin gingival biotype, this encroachment results bone

resorption. This may be corrected itself by gingival recession. However, the resulting attachment loss may lead to aesthetic problems [8].

#### Finish line placement

According to Ingber *et al.* 1977, atleast 3mm space is required from finish line to the crest of alveolar bone to adequate healing and definitive restoration on tooth [9].

#### Rules for finish line placement: [10]

Rule 1: If probing depth for gingival sulcus is 1.5mm or less then finish line should be 0.5mm below the gingiva

Rule 2: If probing depth is more than 1.5mm then finish line is placed on half of its sulcus depth.

Rule 3: If more than 2mm, advised gingivectomy upto sulcus depth of 1.5mm then finish line is placed according to rule 1.

#### Evaluation of violated biological width

- **Clinical method**

Check for margins of prosthesis using periodontal probe whether their extensions upto attachment or not.

- **Signs include**

Chronic progressive gingival inflammation, bleeding on probing, loss of clinical attachment, pocket formation, bone loss and gingival hyperplasia especially in case of subgingival finish line[11].

- Transgingival probing: probing depth upto alveolar crest minus sulcus depth gives biologic width [12].
- Radiographic examination: detect the biologic width encroachment interproximally. The length and thickness of it accurately determined by using parallel profile radiographic technique[13].

#### Management of biologic width violation

##### Surgical crown lengthening

##### Gingivectomy: [6]

- In case of increased sulcus depth as a result from true pockets (loss of clinical attachment) or false pockets (inflammatory gingival enlargement).
- In patients having keratinized tissues in sufficient quantity

##### Apical repositioned flap: [6]

- Without bone resection: if biologic width is more than 3mm and absence of sufficient attached gingiva.
- With bone reduction: in the form of ostectomy and osteoplasty that increase the amount of tooth structure and overlying gingiva in scalloped manner.

Healing time is postsurgically, 6 wks in areas where esthetics is of less concern and longer period for areas of high esthetic demand.

#### Orthodontic extrusion [14]

- Forced tooth eruption via ostectomy

Slow eruption of tooth along with alveolar bone and gingival tissues due to less orthodontic forces are applied. When extrude coronally than desirable then it can be treated surgically

- Forced tooth eruption with fibrotomy

Eruption of tooth is achieved over several weeks in Rapid extrusion method with percision performed weekly to eliminate the growth of bone and gingival tissues along the tooth. Then surgical treatment is performed after stabilizing the tooth in position for a minimum period of 12 weeks.

#### CONCLUSION

Maintainance of biologic width is a key factor for success of prosthesis. It can be maintained by placing finish margin at appropriate location depending on the clinical condition.

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