

# Smile Design- Periodontal Out Look of Basics

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## ABSTRACT

Presence of a healthy periodontium is of utmost importance in terms of dental tissue harmony. esthetic relevance of these supporting tissues play a major role in the final outcome of any treatment procedures. Smile designing is a complex treatment modality which comprises of various periodontal tissue modifications wherever required. This article is a compilation of those aspects related to periodontium.

**Keywords:** Esthetics, Gingival display, Smile

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## INTRODUCTION

End result of any comprehensive periodontal therapy involves provision of a “physiologically balanced periodontal tissues”. Our main objective in therapeutic approach is to provide patients compliance in two major aspects, that is function and esthetics. With the advancement in treatment protocol, we can now stress more on minute esthetic details of periodontal tissues if it is jeopardized. Also an emphasis on a combined periodontal – orthodontic approach cannot be ruled out in bringing the best results in smile design procedures. Those who have a well balanced periodontium along with good set of teeth in desired occlusion, does not pose a problem in their smile design. Smile designing is a complex, interdisciplinary approach to multifactorial problems in most of the cases.

Esthetic smile design is complex, simplified by breaking the problem down into component parts. The teeth are the picture, the gingivae the frame, and the lips the movable curtains.(1)

Any esthetic/restorative treatment success depend on the check list involving –esthetic principles, gingival esthetics, also more subjective esthetic interaction into the frame of the smile, face and more generally, the individual.(2) The individuals ability to

exhibit a pleasing smile directly depend on the quality of the dental and gingival elements that it contains(3). This article is an appraisal of basic sciences involved in therapeutic regime to smile designing.

## FACTORS GOVERNING SMILE

- Structure of lip form- lip line, smile line and curvature of lip
- Gingival elements- Gingival zenith, Gingival line, Amount of display
- Negative space
- Symmetry of smile

## STRUCTURE OF LIP FORM

### Lip Line

There are three basic types of smile pattern depend on the height of upper lip in relation to the maxillary anterior centrals-

- Low lip line
- Middle lip line
- High lip line

An ideal lip line conducive for an excellent smile is one where the upper lip reaches the interdental gingival margin during smile.

### Smile Line and Curvature of Lip

In smiling, the position of the upper lip height relative to the teeth has been ideally located at the gingival margin of the maxillary incisors and appears as an important factor of attractiveness (3).

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Parallelism between the curvature of the inner border of lower lip and the hypothetical line made along the anterior four maxillary teeth edges is the parameter considered in smile line. Curvature of this line is more in females. Position of the upper lip and its height in relation to the teeth is normally placed at the gingival margin of the maxillary centrals.

The relationship of the maxillary incisal curve to the inner contour of the lower lip also can be divided into three types: parallel, straight, and reverse (4).

## GINGIVAL ELEMENTS

### Gingival Zenith

This is an important landmark in the gingival morphology related to the smile assessment. It is the apical most points of the gingival margins, and its located distal to the long axis of the tooth (Fig. 1). The relative contours of the gingival margins of the upper incisors and cuspids greatly influences overall facial esthetics.(5)

### Gingival Line

Its an imaginary line drawn by joining the zeniths of central incisors and canines (Fig. 2).

### Amount of Gingival Display

The typical gingival esthetic problems of excessive gingival display, asymmetry in gingival contours, exposed root surfaces and loss of papillae can limit the success of smile designing and correction. A patient's smile line is determined by the position of the lips during a natural unforced smile. The upper lip determines the length of the maxillary incisor, as well as the vertical position of the gingival margins during a smile. In general, women tend to show slightly more

gingiva than men. Upper lip moves apical to the gingival margins of the maxillary incisors. Ideally 1-2 mm of gingiva is visible. Situation where in more than 2mm gingival tissue is exposed it becomes unesthetic. Excessive gingival display is a condition characterized by excessive exposure of the maxillary gingiva during smiling, commonly called a "gummy smile" (6). Proper treatment can be selected only after the diagnosis and etiology is determined. But a gummy smile is often more esthetic than a smile with diminished tooth display.(7)

### Reasons For Gummy Smile

- Excessive maxillary growth
- Shorter upper lips
- Excessive eruption of the maxillary teeth
- Delayed apical migration of gingival margin over maxillary anterior teeth.
- Tooth malposition

Gingival element in smile design is a vital parameter in designing the treatment plan in improving or enhancing a patients smile. Thus optimal esthetic for smile design include concepts of gingival shape, contours, etc.

### NEGATIVE SPACE

It's a space that becomes evident between the jaws while laughing and mouth opening. It appears at the corner of the mouth as well in smiling. This lateral space is considered to be an ideal situation for scenario for esthetics. This space is due to the result of difference existing between the width of the maxillary arch and the breadth of the smile. This have been described to be in golden proportion with the anterior smiling segment (3).

### SYMMETRY OF SMILE

It refers to the placement of corners of the mouth in the vertical plane. This parameter is judged in relation to a hypothetical central point or centre midline. An asymmetry becomes evident when the corners of the mouth is placed at different level in smiling.

### Periodontal Treatment Aspects in Smile Designing

Periodontium forms the foundation for teeth and their restoration and should be the first consideration in any restorative plan (8).

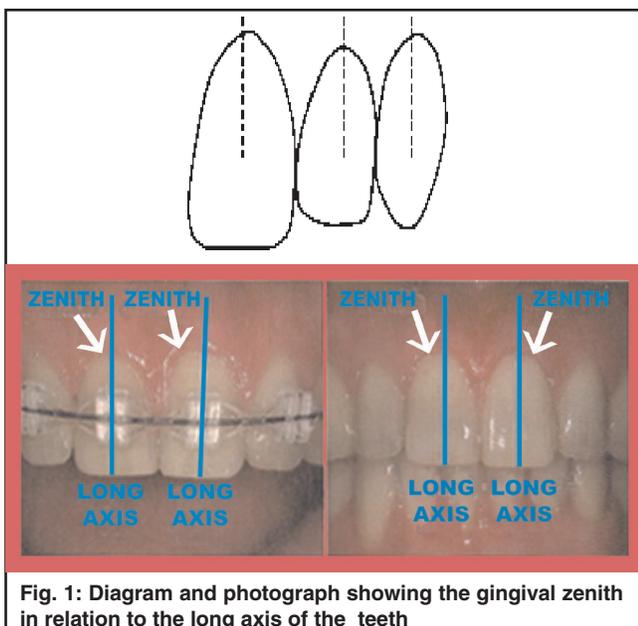


Fig. 1: Diagram and photograph showing the gingival zenith in relation to the long axis of the teeth

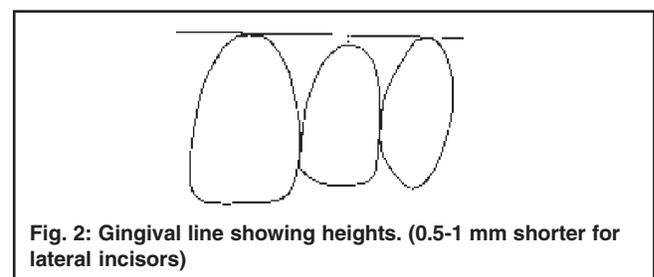


Fig. 2: Gingival line showing heights. (0.5-1 mm shorter for lateral incisors)

If unesthetic problem of smile involves purely of gingival reason option of periodontal surgical correction can be considered. For example in case of gummy smile, if an adolescent patient shows excessive gingiva while smiling first evaluation should be probing the sulcus to assess the depth in relation to cemento enamel junction. Two factors play important role in assessment in this regard- position of gingival margin on the teeth surface and position of the alveolar crest.(9)

Excessive gingival display is generally not a problem in patients with a moderately long upper lip, unless there has been unusual supraeruption of the maxillary anterior teeth or skeletal hyperplasia.(10)

Sulcular depth should be about 1 mm and the CEJ should be located in the sulcular depth. If the depth is between 3-4 mm with fibrotic tissue gingival margin will take time to migrate towards CEJ. In such instances a gingival surgery would benefit the purpose for making the gingival margin more apically.

Gingival margin discrepancies can be addressed by surgical or orthodontic means depending on the underlying cause of the defects.(5)

In any case, as a general rule, surgical intervention must be evaluated on the basis of the relation of the crestal bone with that of CEJ. Ideally crest is at a distance of 2 mm from the CEJ. If the level of bone is 2 mm, to apically place the gingival margin an excisional surgery would be of use. Otherwise if the bone level is within around 0.5 mm from CEJ, apically positioned flap with recontouring the crestal bone is the choice of corrective procedure.

After any corrective periodontal surgery for excessive gingival display following criteria should be met.- the gingival margins of central incisors must be about 1 mm apical to the lateral incisors and should be at the similar level of canines.- contour of the labial gingival margin should simulate the CEJs of the teeth.

Proportion and dominance of the teeth assessment by golden

proportion is an important factor in evaluating the smile design.(11)

## CONCLUSION

Any clinician who wants to evaluate the smile refinement procedures should take into account these basic esthetic guide lines. Smile design is truly an interdisciplinary approach to get the optimal result. Orthodontic, restorative and prosthetic involvement in this field is some times required to attain the best result. Any treatment procedures which has esthetic goal as an end result should consider the relevance of gingival elements. This would bring about the best in our treatment plan.

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