

Evaluating Facial Esthetics by Relating Upper and Lower Lips with E-plane: A Short Clinical Photographic Study

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Abstract

Background: Replacement of anterior teeth is the challenging job for the dentist since its success depends on many factors mainly on the perception of patients toward beauty. There are many criteria to evaluate facial esthetics - one of them is studied and discussed here.

Aim: The aim of this study is to find co-relation of upper and lower lips position with respect to E-plane in individuals having an esthetic/pleasing smile.

Settings and Design: At the institution approved by the guide and college. Experimental study.

Materials and Methods: Photographs of 100 subjects (50 males and 50 females) were clicked in frontal, oblique, and lateral view. Frontal and oblique views were given to panel members along with a visual analog scale to judge esthetic smile. Lateral views of the selected subjects were then studied in software by marking esthetic (E)-plane and calculating its distance from upper and lower lip.

Statistical Analysis: Statistical analysis was performed using Epi Info Software along with Pittsman's test and Baretlet's test. Sampling was carried out by simple random technique.

Result: From the values obtained by the study, mean was calculated, and it was found that average distance of upper lip from E-plane was 2.7 mm (~3 mm) and of lower lip was 1.1 mm (~1 mm).

Conclusion: Upper and lower lip have statistically strong correlation with E-plane in the determination of esthetics irrespective of gender.

Key words: Aesthetics, Beauty, E-plane, Pleasing smile

INTRODUCTION

Nature has endowed everyone with dignity and satisfaction of being an individual personality. Human beings are creatures blessed by the God with various gifts such as brain, speech, emotions, feelings, senses, complexions, etc. All these things when blended together give each person a

unique identity and symbolism of that is expressed through the face. The face has been defined as a chart of destiny, an impression of the fullness of life, and mirror of the soul.

Everyone wants to look beautiful, but the definition of beauty differs from person to person. "Everything has beauty, but not everyone sees it!"¹ What looks beautiful to one person (e.g., dentist) may look ugly or unesthetic to other person (e.g., patient or relatives) since everyone has his or her own perception of what exactly the beauty is. Each dentist has his own idea of what constitutes esthetics. The dentist must have some primary intentions of what he wants and plans to do before attempting the procedure; however, he should realize the flexibility of esthetics. "Beauty does really lie in the eye of the beholder."

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Esthetic concepts about the face and smile are based on person's opinion rather than sound scientific methods. This might be explained by the difficulty to qualify and quantify beauty. However, the measurement of what is beautiful or the perception of beauty in dentistry is fundamental for providing scientific data that can guide diagnosis and treatment planning. The dentist's esthetic judgment and patient's self-image play an important role in clinical treatment decisions. Patient's anxiety about esthetics is affected not only by his or her own perception but also by the reaction of other people.² It is well explained by the statement, "What others will think has killed more dreams than anything else in the world."

Esthetics is a branch of philosophy dealing with the nature of art, beauty and taste, with the creation and appreciation of beauty.³ It is more scientifically defined as the study of sensory or sensory-emotional values, sometimes called judgments of sentiment and taste.⁴ Beauty is "which gives the highest degree of pleasure to the senses or to the mind and suggests that the object of delight approximates one's conception of an ideal." Viewer interpretations of beauty possess two concepts of value: - Esthetics - Philosophical notion of beauty. Taste - the result of an education process and awareness of elite cultural values learned through exposure to mass culture. Therefore, what is beautiful and attractive for the dentist might not be what the patient understands as a beautiful, attractive, and satisfactory clinical result.

Evaluating the face in smiling profile is an integral part of a complete diagnosis and treatment planning.⁵ However, there are few reports about the effects of labiolingual inclination of the maxillary incisors on smiling profile. Cao *et al.*, studied the effect of maxillary incisor labiolingual inclination and anteroposterior position on smiling profile esthetics and concluded that maxillary incisor labiolingual inclination and anteroposterior position have a key effect on the appearance of smiling profile.⁵ Pinho *et al.*, studied the impact of anterior tooth asymmetries on the perception of smile esthetics and found that laypersons, orthodontists, and prosthodontists have different perceptions of attractiveness.²

What is E (esthetic) Plane?

E-plane is an imaginary line drawn from tip of the nose (pronasale) to the tip of the chin (soft tissue pogonion). It has some correlation with the upper and lower lips pertaining to the esthetics of an individual giving him or her unique identity. The purpose of this study is to find a correlation of upper and lower lips position with respect to E-plane in individuals having esthetic/pleasing smile.

MATERIALS AND METHODS

The study was planned with the following objectives:

- To determine pleasing smile

- To calculate distance of upper lip from E-plane
- To calculate distance of lower lip from E-plane
- To relate above findings with E-plane in esthetic smile to individuals requiring restoration of anterior teeth.

Indian subjects (50 males and 50 females) with a pleasant smile, of age 18-25 years (selected by panel members) were included in this study. Subjects with the history of previous orthodontic treatment or with missing or malformed anterior tooth were excluded from the study. Big question was still persisting, "How to determine pleasing smile?" Pinho *et al.*,² stated that prosthodontists and orthodontists have the highest perception of a smile. Hence, the panel was formed to decide pleasing smile comprising of two prosthodontists and two orthodontists. Out of two specialists in each branch, one was male and one was female; one was of younger age group (25-35 years) and one was of older age group (45-65 years) and one was with less clinical experience (5-10 years) and one with more clinical experience (20-40 years).⁶

Digital single-lens reflex camera (Nikon D90) with fixed focal length of 100 mm macro lens was used to take the photographs with a magnification ratio of 1:8 in three different views, i.e., frontal, lateral and oblique. To standardize the size and resolution, a millimeter ruler was placed away from the field to be evaluated. The camera was maintained at a distance of 1 m from the patient.⁷ Consent was obtained from each subject taking participation in the study. Photographs were then clicked in frontal view while the subjects were smiling normally (Figure 1). Photographs in the lateral view were clicked with lips normally placed in contact along with metal ruler placed over head well away from the area to be studied (Figure 2). To ensure reproducible head position, photographs were taken from the position where the eyebrows first coincide exactly while moving the camera from front to side. To click photographs in an oblique view, a 45° line was measured and drawn on



Figure 1: Frontal view

the floor of the studio and photographs were taken from this line (Figure 3). For better reproducibility of head position, the head was turned away so that the contour of the eye does not overlap the skin contour.

Frontal and oblique view photographs were given to each panel member along with a visual analog scale to assess esthetics smile (Figure 4). Evaluators were advised not to compare the photos, to prevent subjective variation. Photographs claimed to be having pleasing smile by all panel members were selected for the study. Corresponding lateral view of the selected photographs were then studied in the personal computer (Sony Corporation SVE1513CYNB) using a Photoshop software (CS2 version 9.0) by marking E-plane and calculating distance of upper and lower lips from it taking markings on the metal ruler as a reference.

Ethics

Procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the

Helsinki Declaration of 1975, as revised in 2000. A written consent was obtained from each individual participating in the study.

Statistics

Statistical analysis is carried out by Epi Info Software. The correlation between male and female in upper lip is significant ($P = 0.00$) by the Pittsmann’s test while the correlation between male and female in lower lip is also significant ($P = 0.00$) by Baretellet’s test.

RESULTS

As the requirement of the study, mean was calculated in upper and lower lip distance with respect to E-plane. In male subjects, mean distance of upper lip was 2.7 mm and lower lip 1.1 mm. In case of female subjects, mean distance of upper lip 2.9 and lower lip 1 mm. The correlation between male and female in upper lip was significant ($P = 0.00$) while the correlation between male and female in lower lip was also significant ($P = 0.00$). So the average distance of upper lip from E-plane was 2.7 mm (~3 mm) and of lower lip was 1.1 mm (~1 mm) (Graph 1).

DISCUSSION

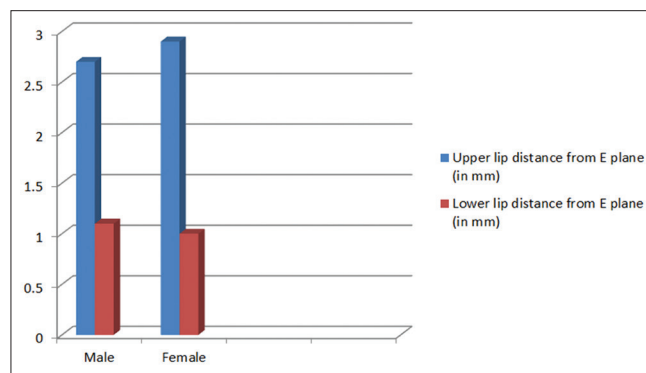
Esthetic appearance has always been a matter of serious concern for most of the patients. As far as anterior teeth restoration is concerned, patients are mainly looking for pleasing or esthetic smile. But the definition of esthetics differs from person to person. It is therefore duty of the



Figure 2: Lateral view



Figure 3: Oblique view



Graph 1: Distance between lip and E plane

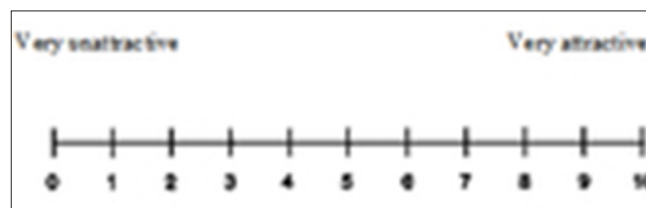


Figure 4: Visual analogue scale (cm)

treating dentist to find the exact need of the patient in terms of beauty and to understand the perspective of the patient what he or she feels is beautiful for him or her since it is the patient who will be living with those teeth and smile provided by the dentist. So, it is the fundamental right of each patient to decide the kind of smile he or she wishes (of course within the scope and limitations).

It has been proved that prosthodontists and orthodontists have the highest perception of smile² but it has to be blended with the expectations and perceptions of the patients for successful treatment outcome.

There are various criteria for selection of shape and size and placement of anterior teeth in order to get esthetic outcome like lip length, gender, type of smile etc. Anteroposterior inclination of anterior teeth also plays very vital role in determining their position which in turn influences position of upper lip.⁵ It should be always kept in mind that teeth has to be placed in neutral zone. Violation of neutral zone will create various problems leading to treatment failure.

Obaidi and Abdul-Qadir⁸ revealed that the upper lip significantly larger behind the esthetic line in female than male at 11, 12 and 14 years age groups.

Statistically, there was no significant difference between distance of upper and lower lips from E-plane in males and females (Graph 1). Though mean was found to be approximately 3 mm for upper lip and 1 mm for lower lip, values were ranging from 1.5 to 4 mm for upper lip and 0 mm to 2 mm for the lower lip. So, further studies with wide sample size are needed to come to any firm decision regarding relation of E-plane with upper and lower lip.

However, this study gives brief idea about relation of upper and lower lip positions with respect to E-plane. Values obtained can be of great clinical importance while replacing upper and lower anterior teeth in dentulous as well as edentulous patients. It is one of the factors to determine the amount of labial inclination of anteriors required for a patient to have pleasing smile.

If patient is having missing upper and lower anterior teeth, then along with lip support, this factor plays a crucial role

in replacing those missing teeth. Furthermore, completely edentulous patients, especially long duration are deprived of normal musculature support. In such patients this factor can be used with great success to get esthetic outcome. To get good clinical results in terms of esthetics, this factor has to be used in conjunction with the other factors which are routinely used on day to day practice.

Many times, patient is having missing upper anterior teeth. In such situation, this factor along with labial fullness and pre-extraction records becomes an integral part if we are desired to get an excellent esthetic outcome.

It is an aid for orthodontists during orthodontic tooth movement although it is not the sole criteria but one of the major criteria to make decisions during anterior rehabilitation procedures.

CONCLUSION

Within the limitations of this study, it has been concluded that upper and lower lip has statistically strong correlation with E-plane in determination of esthetics irrespective of gender. So, along with all other factors, this factor also needs to be taken into consideration while replacing anterior teeth to get a successful outcome.

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