

Esthetic dentistry

Esthetic means pertaining to sense of being beautiful. Recently, patients seeking for treatment of their oral condition with the primary concern of an esthetic enhancement Increased. In social interactions, our attention appears mainly on mouth and eyes of the face of the person speaking. As the mouth is the center of communication in the face, the esthetic appearance of the oral region during smiling is a conspicuous part of facial attractiveness.

Today, esthetic or cosmetic dentistry has become one of the main areas of dental practice. Esthetic dentistry is a delicate combination of scientific principles and artistic abilities.

ELEMENTS OF DENTAL ESTHETICS

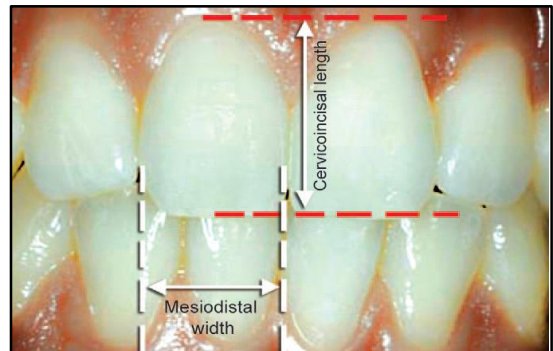
1. Size, shape and thickness of teeth
2. Symmetry and proportionality of teeth
3. Alignment of teeth
4. Contacts and embrasure form.
5. Gingival esthetics
6. Facial proportions
7. Lip line.
8. Color and translucency

1. Size, Shape and Width of Teeth

❖ *Size of Tooth*

It is determined by dividing of mesiodistal width of tooth to cervicoincisal length, i.e. Size of tooth = Width/length ratio. To have optimal dimension, width/length ratio of central incisor should range from 0.75 to 0.8.

- **Ideal ratio 0.75 to 0.8**
- **<0.75 – Narrower tooth**
- **>0.8 – Wider tooth**

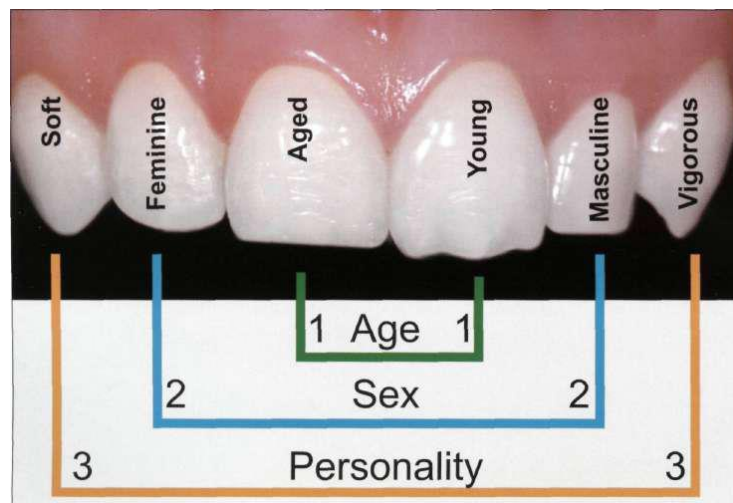


Size of body is visible according to the light reflected from it. It controls width and length, which appears to a viewer. When a tooth is highlighted upon direct light, then

area of depression is shadowed. Tooth size and appearance can be changed by creating different prominences on facial surface. These illusions are useful for creating apparent size of tooth different from actual size. These concepts are important in correction of diastema, smile designing cases.

❖ *Shape of Teeth*

It is determined by age, sex and personality of the individual. A young and feminine smile shows teeth with rounded incisal angles, open incisal and facial embrasure, while a masculine smile shows closed incisal embrasures with prominent incisal angles. If in females slightly broader teeth are present, they require conservative minor modification to produce better esthetics. This is called 'cosmetic contouring'. To create younger and more feminine smile, incisal angles are rounded and incisal embrasures are opened.



❖ *Thickness of Teeth*

Labiolingual thickness of anterior teeth is measured at the junction of middle and incisor third of tooth. Ideally, it should be between 2.5 and 3.5 mm. Minor positional defects can be treated by composites or facial veneers but major defects in position and alignment are corrected by orthodontic treatment.

2. Symmetry and Proportionality of Teeth

❖ *Symmetry*

Dental symmetry is achieved if contralateral teeth are placed equivalent. Restoration of teeth should be done carefully for symmetrical incisal and gingival embrasure.

❖ *Proportion*

The term "golden proportion" is a mathematical rule concerning the proportions of the dentition. This concept was first given by Lombardi and Levin. According to this rule, if the width of each anterior tooth seen from frontal view is approximately 60% of the size of its adjacent anterior tooth, then it is considered esthetically pleasing. It follows logically that if the width of the lateral incisor is 1, the central should be 1.618 times wider and the canine 0.618 times narrower.



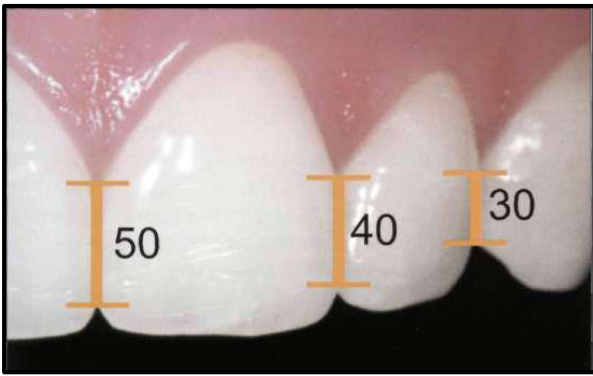
3. **Tooth Alignment**

❖ *Axial Inclination of the Tooth*

A line extending from height of the tooth from free gingival margin to center of the incisal edge implies axis inclination of each tooth. Maxillary anterior teeth display mesio-axial inclination, with the central incisors appearing to be almost vertical, lateral incisors and canines tipping more towards midline. After canines, the posterior teeth display an inclination that is parallel to canines.

4. **Contacts and Embrasure Form**

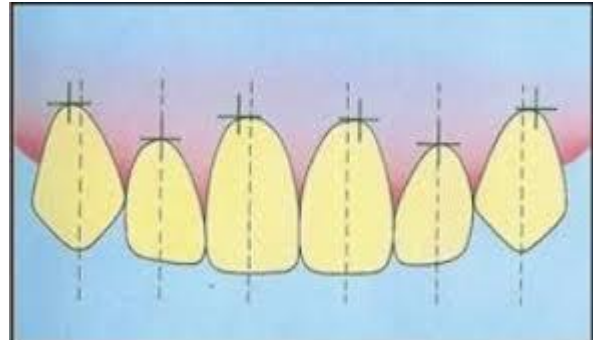
Exact place where a tooth touches other tooth is called a contact. (also referred as interdental contact area). The length of this area is not the same between the incisors. The longest contact area is between the central incisors; the shortest contact is between the lateral incisor and the canine. As teeth proceed from midline to posterior, the contact points move apically. The triangular space incisal to the contact area defined as embrasures. Embrasure area gets larger as the teeth progress posteriorly.



5. Gingival Esthetics (Shape and Contour)

Cementoenamel junction and osseous crest determine the curvature of gingival margin of tooth, called gingival shape. Mandibular incisors and maxillary laterals have oval and maxillary centrals and canines have elliptical gingival shape.

Gingival zenith represents the most apical point at which each tooth emerges from the free gingival margin. For an esthetically pleasing smile, it should be positioned distal to center of each tooth in maxillary anterior segment. Gingival zenith of maxillary laterals should coincide with their longitudinal axis.

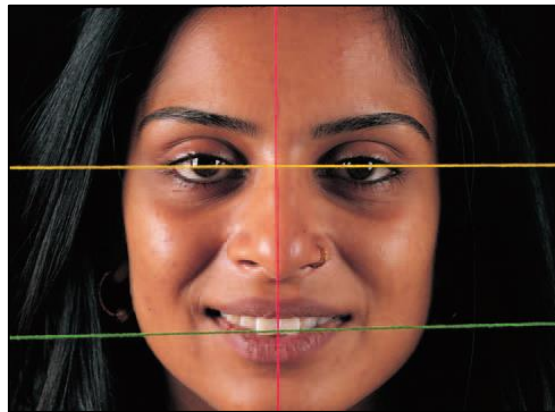


Usually, the zenith points of the lateral incisors are 0.5 to 1 mm below those of the central incisors and canines, while the zenith points of the canines and central incisors remain on the same horizontally drawn imaginary line.



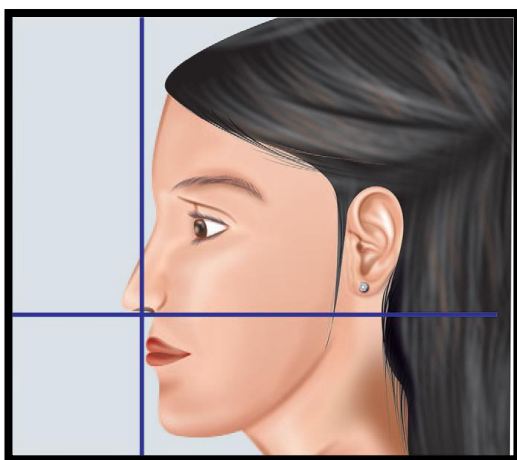
6. Facial Proportions

Facial composition is measured by analyzing the face from frontal and sagittal aspect. From frontal aspect, many landmarks are used to determine esthetics. Horizontal lines are drawn from upper to lower part of face; these are hair line, interpupillary, interalar and commissural lines. Parallelism of these lines results in horizontal symmetry of the face. The interpupillary line is used as a reference for the occlusal and incisal plane orientations. The incisal edges of the anterior teeth should be parallel to the interpupillary line and perpendicular to the midline.

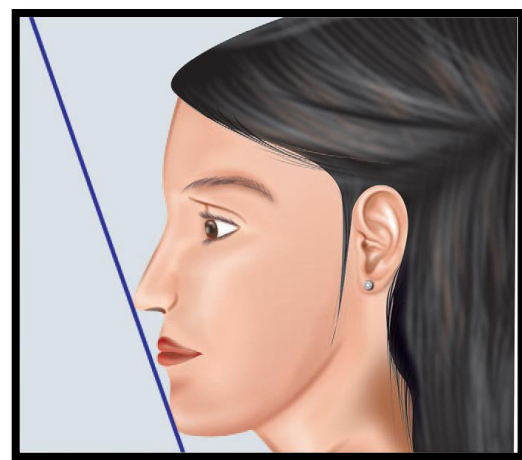


From sagittal aspect, two reference points are used that is nasolabial angle and Rickett's E-plane. Nasolabial angle is formed by intersection of two lines using nose and lips as reference points. Normal value of nasolabial angle for males is 90 to 100 and for females is 100 to 105° .

Ricketts E-plane is line drawn from tip of nose to chin prominence. Using these two reference points, protrusion or retrusion of maxilla can be evaluated.



Nasolabial angle



Rickett's E-plane

7. Lip line:

When smiling, the inferior border of the upper lip as it relates to the teeth and gingival tissues is the lip line. Dentistry has arbitrarily classified three types of smiles that, relating the height of the upper lip relative to the maxillary anterior central incisors, which are referred to as presenting a low lip line, middle lip line, high lip line.

- Average lip line-exposes the maxillary teeth and only the interdental papilla.
- Low lip line: exposes no gingival tissues when smiling.
- High lip line: exposes the teeth in full display also gingival tissues above the gingival margins.

In cases where there is a high lip line and an excessive gingival display exists, an unwanted (**gummy smile**) become evident.

There are many corrective options available. The vertical maxillary excess can be determined with cephalometric analysis. Orthodontics and orthognathic surgery to impact the maxilla are ideal when these conditions are confirmed as skeletal dysplasia"s in nature.



The smile line:

The smile line is an imaginary line running from the incisal edges of the maxillary incisors and coinciding with the curvature of the lower lip.

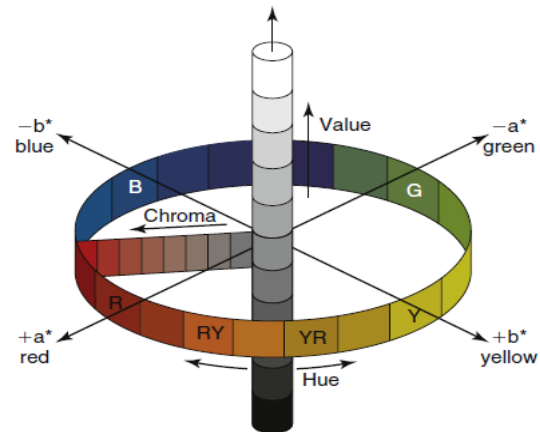


8. Color and Translucency

Color

Color is defined as property of surface or object as a result of absorption of certain light rays and reflection of others, which excite the photosensitive receptors of an eye. There are different color combinations, which help the dentist to select the most appropriate color matching with the tooth or teeth in patient. Munsell color system is most commonly used visual color system. It consists of the parameters, which are represented in three dimensions:

- ✧ Hue is the name of the color (color tone (red, green, yellow)).
- ✧ Chroma represent the saturation or the intensity of color
- ✧ Value corresponds with the lightness or darkness of the color.



Translucency

Degree of translucency means how deeply light penetrates into the tooth or restoration before it is reflected outwards. The goal of an optimal restoration is to achieve the natural appearance of the tooth. Translucency indicates lifelike esthetic and vitality of natural teeth. The opaque, dead appearance of a restoration should be avoided. The incisal third of the tooth is more translucent than the middle and cervical thirds.

There are a number of problems, which can alter the esthetics of anterior teeth like:

- 1) Caries
- 2) Tooth discoloration because of trauma, hypoplasia and other factors
- 3) Tooth malformations
- 4) Diastema between teeth
- 5) Malalignment of teeth
- 6) Fracture of tooth
- 7) Cervical lesions like erosion, abrasion and abfraction
- 8) Attrition of teeth
- 9) Ectopic eruptions.

Many treatment options are available that can be employed to improve the esthetics of affected tooth/teeth:

- 1. Enameloplasty:** It helps in improving minor changes in contour of tooth by removal of enamel. It is done to smoothen the roughened enamel margins, fractured tooth surfaces and to soften interproximal angles. Tooth is polished after ameloplasty.
- 2. Bleaching:** Teeth with mild to moderate discolorations can be treated by bleaching (teeth whitening).
- 3. Restorations with Composite Resins:** Composite resins are indicated for treatment of minor defects present on incisal edges or labial surfaces of teeth like caries, fracture, diastema, peg-shaped laterals, etc.
- 4. Veneers:** Veneer can be described as a layer of tooth colored material which is applied on the tooth surface for esthetic purpose. Veneers are used to mask the intrinsic discolorations, localized and generalized defects.

Types of Veneers Based on method of fabrication:

- a) Direct veneers (Composite veneer):** Because of the possibility of etching the enamel and dentin, the clinician can bond resin composites directly to the tooth, using an incremental layering technique. This requires minimal or no tooth preparation and can be performed in one session without any laboratory costs.
- b) Indirect veneers (ceramic veneers):** When it became possible to etch the enamel with phosphoric acid and condition the cementation surfaces of the ceramics with hydrofluoric acid followed by silanization, ceramic laminates could be permanently bonded to teeth.

Indirect Ceramic Veneers Vs Direct composite veneers:

Ceramic veneers are stronger and more durable than direct composite veneers and have more color stability but they cannot be repaired easily and its color cannot be altered substantially after placement. Direct composite veneers can be done in single visit, as it not required laboratory procedures and it is more economic than indirect ceramic veneer.

- 5. Full Coverage Crowns:** Full coverage restorations are required to increase the esthetics. These restorations can result in change in shape, size, and contour that remarkably change self-image of the patient.
- 6. Orthodontic treatment:** Orthodontic treatment is usually used for correction of malaligned teeth, diastema, ectopic eruptions especially when patient is young and dentition is more amenable to rearrangement.