

# Role of Microesthetics in Orthodontics: A Review

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**Abstract:-** The following three phases are commonly followed when doing a thorough inspection of the facial and dental appearance: Macro-esthetics are the proportions of the face in all three planes of space, while micro-esthetics are the proportions of the dentition in respect to the face, and micro-esthetics are the proportions of the teeth in relation to one another. Microesthetics entails evaluating tooth height and breadth proportions, gingival shape and contour, connectors and embrasures, black triangular holes, and tooth shade. The elements impacting microesthetics that must be addressed in the construction of an orthodontic problem list if an ideal aesthetic is to be achieved are presented in this review paper.

## I. INTRODUCTION

The dental part of microesthetics involves the alignment of dentition on the arches, as well as their colour, form, size, and proportions. With our patients' increasing aesthetic demands, it's critical that we understand and meet their expectations. Each of our patients is a one-of-a-kind individual with distinct qualities and characteristics. Aesthetic dentistry does not entail just imposing a conventional smile on each individual. To achieve the perfect smile, the doctor must blend scientific aesthetic principles with artistic flair to complement the patient's unique personality. The interaction that develops among the hard and soft tissues determines the main aspects

of a smile. For the vast majority of patients, the primary goal of orthodontic treatment in recent years has been to improve dental and facial aesthetics. This goal is not "just cosmetic". It represents the patient's desire to improve their social acceptability and eliminate appearance-based prejudice, which has a significant impact on their quality of life.

It's crucial to remember that there are various combinations of smile qualities that might make it more or less pleasant, especially when the patient's entire face is examined. People look at other regions of the face first and for a longer amount of time before looking at the teeth, according to Kokich Jr, Kiyak, and Shapiro.<sup>1</sup> As a result, microesthetics must be taken into account in its right context. Orce-Romero et al. studied the common characteristics that influenced esthetical perception in various populations around the world in a recent study.<sup>2</sup> This research was based on an examination of 500 celebrities' smiles as shown in Time magazine. They discovered that the most influential factors in defining a smile as pleasant are upper lip vertical height, smile width, upper central incisors exposure, dental symmetry, and intra-dental proportions, correlating with the findings of other authors who discovered an evolution in the esthetical criteria of professionals and laypeople.<sup>3</sup>

Many of these characteristics are related to microesthetics and, if correctly managed by the orthodontist and specialists from other related fields, are determinants of the smile's esthetical brilliance, as shown in figure 1.

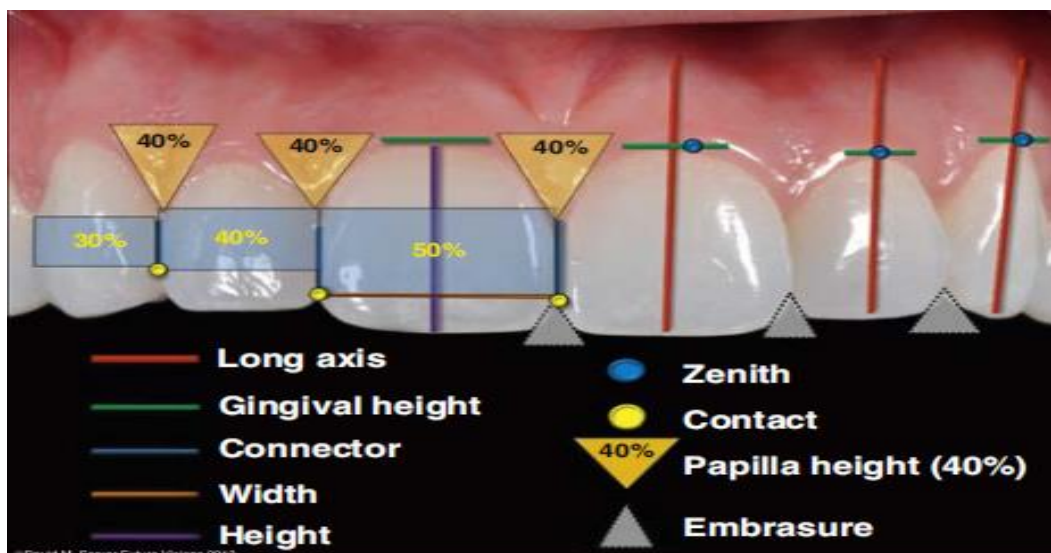


Fig. 1: Factors associated with microesthetics

- Tooth size and shape
- Incisor embrasures
- Connectors and Contact points
- Axial inclination
- Shade progression
- Gingival shape and contour

### A. TOOTH SIZE AND SHAPE

The morphology of the maxillary anterior teeth is controlled by genetics and therefore differs from person to person. A tooth's shape can essentially be classified into square, ovoid, or triangular forms, which can be inferred from neighbouring teeth, previous study casts, and images. Straight mesial and distal contours, as well as parallel transitional line angles and lobes, distinguish square teeth. The cervical region of these teeth is vast, and the incisal margins are normally straight. Curved mesial and distal outlines with smooth transition line angles distinguish ovoid teeth. When incisal to cervical convergence occurs, the cervical region narrows and the incisal borders become more rounded. Teeth with a triangular shape have a straight outline with distinct transition line angles and lobes. From incisal to cervical, there is a more prominent convergence, notably on the distal outline, which is visibly sloped, establishing a narrow cervical region. The incisal edges tend to be slightly curved.<sup>4</sup>

Fixed measures based on tooth size averages are another practical technique to use dental proportions to determine the breadth of anterior teeth.<sup>5</sup> Real width and

height are measurements taken directly on the teeth (anthropometric measurements), i.e. their absolute dimensions. It's a good idea to think about the virtual dimensions, which are effectively what people experience - the aesthetics that truly count.

### B. INCISOR EMBRASURES

The size and volume of the incisal embrasures between teeth grows as the dentition moves further from the midline. To put it another way, the incisal embrasure distance between the lateral and central incisors should be more than the incisal embrasure space between the central incisors, as seen in figure 2.<sup>6</sup>

The space between the canine and the lateral incisor should be larger than the space between the lateral and central incisors, and it should get bigger and bigger as you move further distally. This is mostly due to the structure of these teeth, which causes the contact point between the teeth to migrate apically when the central incisors move distally. If sufficient incisal edge embrasure gaps are not provided, the teeth will appear overly uniform, giving the impression of a more senior dentition.<sup>7</sup>



Fig. 2: Incisal embrasure distance between central incisors is smaller than that between central and lateral incisor

### C. CONNECTORS AND CONTACT POINTS

The connector gap is bigger than the contact area, and in an ideal smile, the 50-40-30 rule governs the relationship among anterior dentition, as seen in figure 3.

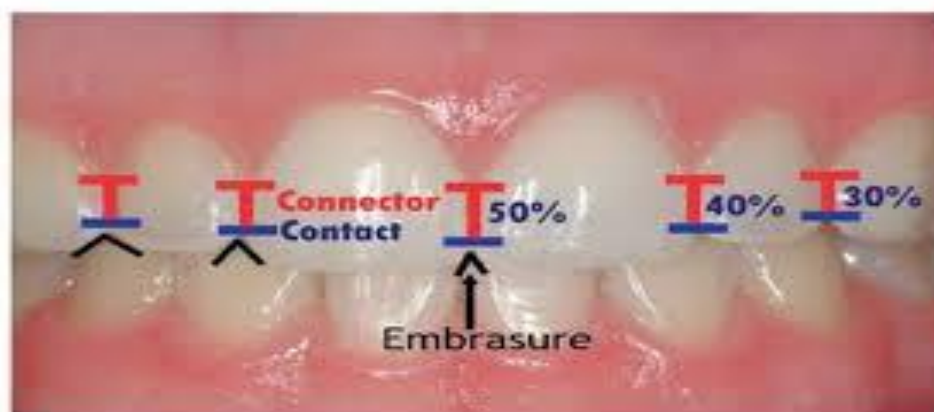


Fig. 3: 50-40-30 rule for connectors

According to this criterion, the ideal connector zone between the maxillary central incisors is 50 percent of the length of the central incisors. A connecting zone of 40 percent of the length of the central incisor would be excellent between a maxillary lateral incisor and a central incisor. When viewed from the side, the ideal connector zone between a maxillary canine and a lateral incisor would be approximately 30% of the length of the central incisor.

#### D. AXIAL INCLINATION

The direction of the anterior teeth in reference to the central midline is referred to as axial inclination, and it increases in severity from the central incisor to the canine, as seen in figure 4. All of the anterior teeth that are connected to the midline have a distinct mesial inclination. On either side, the axis of the premolars and the first molar have a mesial inclination in reference to the midline. An

occlusion analysis should also take into account the mesiodistal axial inclination (tip) of permanent teeth. Andrews calculated the mean values of tooth crown angulation and picked it as one of the six criteria to assess in an ideal static occlusion.<sup>8</sup>

Axial inclinations should be assessed thoroughly both clinically and radiographically at the start and completion of orthodontic therapy. The frontal aspect of tooth inclination can be observed around the central vertical midline, which functions as a fulcrum around which the axial inclination of teeth on each side exhibits a phenomena of line balance. When deviations in axial inclination go beyond the point of balance, they generate visual tension. The posterior angle is calculated by extending the long axis of the maxillary incisors as seen on the lateral cephalogram to the S-N line.<sup>9</sup>



Fig. 4: Ideal axial inclination

#### E. SHADE PROGRESSION

The central incisors of the maxilla are the whitest and brightest teeth in the smile. The colour of the maxillary lateral incisors is comparable to that of the central incisors, but they are normally a shade or two darker. The canines have a lower value and have a higher chroma saturation than the other anterior teeth. The first and second premolars have a value similar to the lateral incisor and are lighter and brighter than the canines.<sup>10</sup>

When striving to build anterior natural-looking restorations in prosthodontics, this imitation of shade progression is critical. The maxillary central incisor teeth are usually the lightest and brightest teeth in the smile, which contributes to their sensation of central dominance. The colour of the maxillary lateral incisor teeth is comparable to that of the central incisors, however the value may be significantly lower. The canines are the teeth with the highest chroma saturation and the lowest value of all the anterior teeth. The value of the premolar teeth is comparable to that of the lateral incisors, and they appear lighter than the canines.

The brightness or value of a tooth changes in different areas within the same tooth and from tooth to tooth. The middle third of the tooth, followed by the cervical third, is usually the brightest. Because of the increased transparency

and absorption of light in this area, the incisal third has the lowest value.

#### F. GINGIVAL SHAPE AND CONTOUR

The curvature of the gingiva near the tooth's margin is referred to as gingival shape. The gingival form of the maxillary lateral incisors should be symmetric half-oval or half-circle for optimal appearance. The gingival contour of the maxillary centrals and canines should be more elliptical and orientated distally to the long axis of the tooth. When optimum dental proportions and dimensions are determined, the relationships between the heights of the crowns of upper anterior teeth also define the adequate gingival contour.

The parameters that must be sought to obtain gingival contour were defined by Kokich, Nappen, and Shapiro, with the gingival margins of canines and upper central incisors at the same level, and that of upper lateral incisors 1 mm below those, as shown in figure 5.<sup>11</sup> If colour and shade effects are established in prosthetic treatments to minimise the virtual height of lateral incisors, a margin of the lateral incisors at the same height as the central is regarded acceptable. If there is gingival exposure when smiling, the gingival contour must obviously be considered aesthetically essential, especially if the smile line is high.<sup>12</sup>



Fig. 5: Ideal gingival margin

## II. CONCLUSION

For optimum facial esthetics, achieving ideal microesthetics play a major role. An interdisciplinary approach is usually helpful. Every factor should be given importance and only then a smile can become esthetic which will in turn make the face esthetic.

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