

DYNESTHETIC INTERPRETATION OF ESTHETICS IN COMPLETE DENTURE

Himanshu Aeran¹, Rubina Gupta², Mukesh Dhanda³

¹ M.D.S. Director P.G. Studies & Professor Prosthodontics
Seema Dental College & Hospital,
Rishikesh
² M.D.S., Asstt. Professor
Muzaffarnagar Medical College
Muzaffarnagar
³ M.D.S Professor & Head
Prosthodontics
Seema Dental College & Hospital
Rishikesh

Abstract

Function & esthetics are inseparable & interdependent factors of prosthodontic success. The development & use of adequate function is the first step followed by final refinement of prosthodontic service i.e. the dentogenic phase. The dynesthetic and dentogenic concept, when applied, provides a more natural, harmonious prosthesis, which not only is desired by patients, but also is a quality of care they deserve. Outstanding esthetics can be achieved by simple guidelines, using tooth molds specifically sculpted for males and females, arranging prosthetic teeth to correspond with personality and age and sculpting the matrix (visible denture base) with more natural contours. There is no reason for edentulous individuals to be provided with care of any less quality than that available with other procedures, such as crowns, bridges, veneers, or implant restorations.

Key words

Esthetics, Dentogenic Concept, Dynesthetic Concept

INTRODUCTION

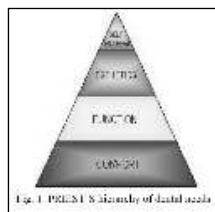
Webster's third new international dictionary defines "esthetic" as appreciative of, responsive to or zealous about the beautiful; having a sense of beauty or fine culture". It is truly said that "beauty lies in the eyes of the beholder".

But to look at the patient & interpret him in the denture & make him look beautiful to other people is the real challenge in front of the dentist. The branch of dentistry dealing with the ways of achieving life-like results is esthetic dentistry.

Esthetic dentistry can be defined "as the art and science of dentistry applied to create or enhance beauty of an individual within functional and physiological limits." It is the art of dentistry in its purest form. The purpose is to use function as the foundation of esthetics

Cosmetic dentistry is application of the principles of esthetics and certain illusionary principles, performed to signify or enhance beauty of an individual to suit the role he has to play in his day-to-day life or otherwise

Dr. PRIEST gave a hierarchy of dental needs (fig. 1).



According to him, there are basically four levels of patients needs - first comfort, then function followed by esthetics & lastly self esteem. He says that a

person cannot rise to the upper level until the lower level is achieved i.e. if the patient is not comfortable with his prosthesis, he cannot be satisfied with its function. Once satisfaction with comfort & function is achieved, the patient becomes conscious about esthetics & once all three are acceptable to the patient; the prosthesis definitely helps in increasing his self esteem.

PERSONALITY IN TREATMENT PLANNING

BAKER & SMITH in 1939 classified personalities into:

Group I: are well adjusted individuals. These patients are successful in their life & career & want treatment for esthetic reasons. Ideal patients.

Group II: are people with unassertive or inadequate personalities who use their disfigurement as a shield & unconscious defense. A subset consists of passive people who are grateful for any assistance or aid given.

Group III: are prepsychotic or psychotic people for whom the facial abnormality was focal point of deviant personality. Any esthetic correction serves only to disrupt rationalization process

Acc. to LEVIN (1988)

Driven: focuses on results, time conservation oriented.

Expressive: wants to feel good, highly emotional

Amiable: reacts poorly to pressure, emotional, fears consequences

Analytical: requires endless details, highly exacting

ESTHETICS IN DENTURES

"DENTURE ESTHETICS" is defined as the

Address For Correspondence:

Dr. Himanshu Aeran
Seema Dental College & Hospital
Rishikesh- 249203, Uttarakhand, INDIA
Tel: +91-135-2453465, Fax: +91-135-2453743
MOBILE NO.: 9837063005, 9219632066
E-MAIL: dr.himanu@yahoo.com

cosmetic effect produced by a dental prosthesis which affects the desirable beauty, attractiveness, character and dignity of the individual.

FRUSH & FISHER in 1956 gave dentogenic concept & its dynesthetic interpretation to give a more natural & individual appearance to the dentures of a patient.

FISHER states that "Utilize the approach of an artist while analyzing the patient first as to sex, i.e. Male or female, then as to personality i.e. Vigorous or delicate, & then as to age, i.e. young, middle aged or old."

The original concepts of these important considerations belong to WILHEHN ZECH, a sculptor in Switzerland. He observed that "it was possible for a sculptor to express vigor & delicacy in his arts of work. So, it should be possible for the dentist also to do so in his artificial denture." This was an integral part of thinking that led to the whole concept of "DENTOGENIC RESTORATIONS".

The Dentogenic theory of esthetics is a basic esthetic concept for all phases of dentistry where appearance is a factor. It is explained as the prosthodontic appearance interpretation of three vital factors which every patient possesses: sex, personality & age, Hence, also known as SPA concept.

The word "dynesthetic" uses the word "dynamics" as applied to the fine art of producing 'life-effect' in a denture. Dynesthetics are the secondary factors of dentogenic restoration. The dynesthetic and dentogenic concept, when applied, provides a more natural, harmonious prosthesis, which not only is desired by patients, but also is a quality of care they deserve. Outstanding esthetics can be achieved by using these simple guidelines.

DYNESTHETIC INTERPRETATION OF DENTOGENIC CONCEPT:

To apply the dynesthetic techniques in prosthodontics requires knowledge of dentogenic concept. The selection of artificial teeth, their subsequent sculpturing, the individual & detailed positions of these teeth, & the color & contours of the denture base are all parts of the dynesthetic concept & can be done in a comprehensive manner with reference to patient's age, sex & personality as primary factors.

In other words, the dentogenic concept is basically how we perceive a patient's appearance & the procedures carried out to make that appearance a reality is dynesthetic concept.

The dynesthetic techniques are rules which concern three important divisions of denture fabrication: The tooth, its position & its matrix (visible denture base). The dynesthetic techniques that can be accomplished by the technician in the laboratory as supplementary help to dentist:

Physiologic tooth selection:

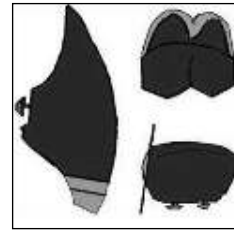
Our purpose is to create an illusion of natural dentition. Hence, artificial tooth shades should be selected according to physiologic color changes seen in progressively aging, undiseased natural teeth.

For e.g.: the Young have a solid & opaque color with little or no color texture. Therefore, select teeth with blue incisal edge & a yellowish unmarred body. On the other hand, older people due to wearing of mamelons & exposure of dentino-enamel junction exhibit more of grey tinge instead of blue. So, Slightly discolored teeth or teeth with changed color texture can be used. But that does not necessarily mean darker teeth. The old can have lighter shaded teeth than the young. It basically is influenced by the habits & personal grooming of the patient.

Special considerations can be given to smokers. For such cases canary yellow, pikgray, gray-brown etc., shades of teeth are available. Tobacco stains can also be incorporated in patient having a long standing tobacco chewing habit. Special shades can be used to depict for fixed, removable partial dentures, restorations etc. to give a more natural appearance to the denture.

Mold selection:

The selection of an acceptable personality mold involves its subsequent treatment for abrasion, erosion, depth grinding, shaping & polishing. (fig. 2)



The progressive abrasion of the teeth occurs with age of the person. In artificial teeth it can be depicted by making an oblique cut at incisal edge.

Erosion also increases with age & can be duplicated by grinding & polishing the artificial tooth. It should be achieved to a lesser degree in anterior teeth than posteriors.

Depth grinding gives the feeling of depth to a tooth, the third dimension, for realism. It gives the feel of sex & personality to the denture. It is done on the mesial surface of the central incisor. The mesio-labial line angle of the central incisor is ground in a flat cut, following the same curve as the mesial contour of the tooth on order to move the deepest visible point of the tooth further lingually. This is followed by careful rounding, smoothening & polishing. A flat, thin, narrow tooth is delicate looking while a thick, heavily carved tooth (severe depth grinding) is symbolic of maleness.

Midline:

The facial midline serves to evaluate the location and axis of the dental midline and the medio-lateral discrepancies in tooth position. The dental midline, if perpendicular to the inter-pupillary line and coinciding with the bridge of the nose and the philtrum, produces an attractive orientation of the smile.

The features of the face usually slant one way or another. Hence, eccentric midline if not too exaggerated is acceptable & may lead to illusion of natural dentition. But it should always be vertical or with slight labial inclination to incisal & occlusal plane.

Speaking line:

It is the incisal length or the vertical composition of the anterior teeth. The final evaluation of incisal length is made when the patient is speaking. While speaking seriously, the tip of lateral incisors should be seen.

As for central incisors, with lips at rest – Young woman = 3 mm, Young man = 2mm, Middle age = 1.5mm, Old age = 0 – 2mm should be seen.

Smiling line:

Smile line is a curve whose path follows the incisal edges of central incisors up & back to the incisal edges of lateral incisors & thence to the tips of the cuspids.

It is very important as is the primary factor of esthetics. In females it

follows the curve of lower lip while in males the lateral incisors are above the centrals & the cuspids are arranged at the level of central incisors. Smile line flattens with age resulting in a straight incisal plane which is said to have a “gull wing appearance”. (fig. 3)



CENTRAL INCISORS POSITION

Dominance is an important physical attribute of dento-facial composition. It exists when a strong centralized structure is surrounded by well demarcated, characterized structures. This role is played by the central incisors as they are the first teeth to be seen. Their placement controls – Midline, Speaking line & Smiling line composition, Lip support & Labioversion.

They are the basis of personality mold selection. Their shape depicts the personality & position determines the strength & action of the dentogenic composition.

They can be placed in three different ways to give a vigorous personality to the denture: by placing the cervical end of one incisor out, by placing one central incisor bodily ahead of the other or by combined rotation of two central incisors with the distal surface forward with one incisor depressed at cervical end & the other depressed incisally.

They must contrast sharply in size with lateral incisors. This can be achieved by either selecting a larger sized central incisors & canines or by taking the lateral incisors from the smaller sized mold.

They must be depth ground for the feeling of depth & hence the life like appearance of the dentures.

LATERAL INCISOR POSITION:

The position is subordinated in importance to that of central incisors. In dentogenics, it is basically the sex determining tooth.

Its rotation will harden (masculine) or soften (feminine) the composition. The lateral incisors rotated to show its mesial surface, whether overlapping centrals or not, gives softness or youthful coquettishness to the smile.

This effect can also be achieved by rounding or squaring the edges. Squaring of incisal edges leads to a masculine appearance.

They should have asymmetric long axis & the tips should be visible when speaking seriously.

Cuspid position:

The position of the cuspid is important as it supports the anterior arch form at its widest part & also controls the size of buccal corridor.

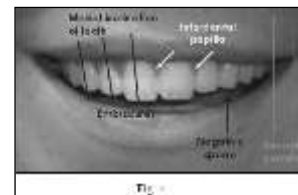
They should be carefully positioned so as to dominate the lateral incisors & complete the upward curve of smile line. The three basic requirements for their placement are that they should be rotated to show mesial surface with their cervical end out & the long axis should be vertical when observed from the side.

They represent the age factor of dentogenic restorations. The cuspid tip should be artistically ground (in an curvature) so as to imply abrasion against opposing teeth. Hence, amount of grinding done is dependent on the age of the patient but it should always follow a curve.

Their arrangement is also helpful in depiction of sex of the patient. If they are positioned such that the smile line follows the curve of lower lip, then the composition appears feminine. Also, prominent cuspids that are rotated to show about 2/3rd of the labial surface are symbolic of male characters while in females only mesial 1/3rd is visible.

Long axis of teeth:

Each combination of tooth inclinations in a smile is unique. The long axis of the natural teeth varies, although in very minute degrees. The direction of the anterior teeth in an esthetic smile shows the medial tipping of the axial inclinations which increases as one moves further from the midline. (Fig. 4)



This progression, therefore, should be exaggerated in the dentogenic restoration as an artistic device.

EMBRASURES

The pattern of silhouetting created by the edges and separations between the maxillary anterior teeth against the darker background of the mouth helps define a good-looking smile. It represents a divergence of the proximal surfaces of the anterior teeth from the contact point. These spaces between the edges of the teeth known as embrasure spaces follow a pattern that develops between the central incisors and then progress laterally. The size and volume of the incisal embrasures between teeth increase as the dentition progresses away from the midline. In other words, the incisal embrasure space between the lateral incisor and the central incisor should be larger than the incisal embrasure between the central incisors & so on. (Fig. 4)

INTERDENTAL PAPILLA

It forms the main part of tooth matrix. This is the part of the denture base that is visible when the patient speaks or laughs.

If correctly formed, they accomplish four purposes i.e. they create a hygienic interdental area, they determine the outline form of the tooth, they act as a complimentary factor in age interpretation, & they also bring a degree of color reflection to the interdental area which creates the illusion of natural dental composition.

The papilla must extend to the point of tooth contact & must be convex in all directions to make them self cleansing & hygienic. Also they must be of various lengths to give a more natural appearance to the prosthesis. (Fig. 4)

The tip of the papilla at its lowest point must terminate at the juncture of the labial face & lingual face of the tooth. It should never slope inward to terminate toward the lingual portion of the proximal surface rather turns upwards & back to form the bottom of the groove which is known as lingual cutaway.

The papilla must be shaped according to the age of the patient. In young people have papilla that are at the contact point, finely stippled, pointed & tight against the tooth while in the old age the interdental papilla are convex, rounded & shortened due to recession. The middle aged lies somewhere in between.

LINGUAL CUTAWAY

It is a groove in interdental area which begins at contact point if the teeth are together or at the tip of the interdental papilla if a diastema is present. It widens & deepens according to natural divergence of lingual proximal tooth surfaces. It fades away into palatal surface of the denture.

While incising, this polished channel helps in sweeping the food & keeping the area clean.

BUCCAL CORRIDOR

It is the space created between the buccal surface of the posterior teeth & the corner of the lip when the patient smiles. It brings about a harmonious cohesion between the various elements of the smile. (Fig. 4). Its size & shape are controlled by the position & slant of the cuspid. It helps by preventing the "sixty tooth smile" or "molar to molar smile" which is often characteristic of a denture.

Obliteration of these essential spaces by dental elements like bulky canines, wide arches or over-contoured restorations can lead to an unattractive smile. Excessive buccal corridor seen in cases of missing premolars or palatally placed posteriors and a constricted arch also appear unaesthetic.

SPACES

Spaces between teeth are highly effective but their size & position must be artistically & hygienically formed.

Diastemas should always be placed asymmetrically on either side of the dental arch & a midline diastema is to be avoided as it appears unesthetic. They should be Vshaped to shed food. When placed between posterior teeth allows for additional spillways for food & creates additional cutting edges from the marginal ridges.

The width of the diastema should be such that it is inconspicuous in a denture. Spaces which are too wide appear as black holes. Conversely, too narrow spaces are not hygienic.

GUM LINE

Esthetic conditions related to gingival health and appearance are an essential component of effective smile design. Inflamed, uneven gingival lines detract from a pleasing smile. Blunted papilla and asymmetric gingival crests become part of the overall esthetic picture. (fig. 5)



Fig. 5: a) slight canting of gum line
b) gingival zenith
c) gum line symmetric on both sides
d) lateral incisor line is lower than central & canine

The gum line at the cervical ends of the teeth should be parallel to interpupillary line for most pleasing appearance, although slight canting in maxillary teeth is allowed for more natural appearance.

The gum line should be symmetrical on both sides of the midline with the gum line over the lateral incisor below a straight line drawn from central to canine gum lines

The gum line should follow the concept of GINGIVAL ZENITH: i.e. The height of contour of gingival margin is slightly distal to long axis in maxillary central incisor, on the axis in lateral & slightly distal in case of canines.

DENTURE BASE CONTOURS

The denture base contour is convex, vertically from the denture base border to the tip of interdental papilla in the anterior region. Denture characterization is defined as "the modification of the form & color of denture base & the teeth to produce a more life-like appearance."

Denture base can be divided into two portions: matrix (visible portion of the base) & the nonvisible part. The nonvisible part should provide a smooth & self-cleaning surface. The matrix on the other hand requires special attention & should have over accentuated characterization to give a more natural appearance to the denture. Some interpretation of age, sex & personality should be made in gum matrix. Denture base characterization can be achieved by:

Stippling: (fig.6) In natural dentition, the papillae and marginal gingiva are smooth, but the band of attached gingiva in between has a stippled or orange-peel appearance. It is less prominent in old age. This creation of minute pore-like depressions on the attached gingiva portion of denture base to create this orange peel appearance is known as stippling.

Stippling of the areas representing the attached gingiva may be accomplished in a variety of ways: positive stippling & negative stippling. Positive stippling is achieved by blow-wax technique while negative stippling is done by making pores in the wax pattern using a tooth brush or Robinson bristle brush. The result of positive stippling is more natural looking which seems to collect less debris and calculus, and is easier to clean than the indentations made by negative stippling techniques.

Festooning: (fig.6) The contour of the gingiva presents a festooned appearance with intermittent elongated prominences corresponding



Fig. 6: stippling & festooning by coating wax

to the root contours. It is recommended that casts from patients with natural teeth be used as guides for gingival waxing and festooning. Without festooning and stippling, light is not randomly reflected and the denture becomes a smooth, pink mirror appearing artificial & lifeless.

Tinting & staining of base: The soft tissue shade guide is used to select a denture base material. The same shade guide can also be used to select other tissue colors and unusual characteristics, i.e., blotches of melanin, hemangiomas etc. Characterization of artificial teeth with stained incisors, cracks or simulated restorations may also be

recorded. This is done at the appointment when the artificial teeth are selected. A simple method of charting is needed to record these observations. The denture tinting chart may be reproduced and used to provide instructions for the dental laboratory. Denture staining can be done before or after the curing of the dentures.

CONCLUSION:

Denture esthetics has been discussed in terms of the anatomic-physiologic and artistic phases. A dentist must learn to see and try to understand the laws of physics, physiology, and psychology governing the perception of natural teeth & must apply the same principles to reproduce life-like teeth substitutes. On the other hand, the technician should carefully follow all the laid down guidelines & help the dentist in achieving the primary objective of patient satisfaction.

The changing trend in field of esthetic dentistry will reorient the art element involved in esthetic dental creations but its established scientific guidelines will always provide the sound basis for this change. By using these principles, the right smile can be created, one that reflects personality and character of the patient with all the benefits to health, spirit and mind that comes from confidence.

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