



## DENTURE CHARACTERIZATION – AN LITERATURE REVIEW

Dr. Sanjna Nayar

M.D.S., Head Of Department, Department Of Prosthodontics, Sree Balaji Dental College And Hospitals.

Dr. Priya Dharsini\*

PG, Department Of Prosthodontics, Sree Balaji Dental College And Hospitals.  
\*Corresponding Author

**ABSTRACT** To meet the esthetic needs of the denture patient, we should make the (denture) teeth look like (the patient's) natural teeth." Fabrication of complete dentures not only replaces the missing teeth but also restores the esthetics, phonetics and function.

Complete dentures characterisation is necessary for dentures to bring a life like appearance, to make it appear more natural.

Every denture should be characterized according to the each patient, rather than doing a pearl like arrangement of teeth with a twinkling, acrylic resin denture base which reveals it to be false and denture look.

Our esthetic aim is to produce denture with anatomic characterization that present before loss of teeth.

**KEYWORDS :** Complete Denture, Esthetics, Characterization, Staining, Tinting.

### Introduction

Glossary of prosthodontics terms says "Denture characterization is modification of the form and color of the denture base and teeth to produce a more life like appearance."

Frush and Fisher quotes, "the environment of the teeth is as important as the tooth itself". The two things considered in denture esthetics are teeth and their supporting denture base.

Complete dentures must be esthetic as well as functional.(1) Hardy stated that, "To meet the esthetic needs of the denture patient, we should make the (denture) teeth look like (the patient's) natural teeth."(2).

### Methods of Complete denture characterization can be:

1. Characterization by selection, arrangement and modification of artificial teeth.
2. Characterization by tinting the denture bases.

### Characterization by selection, arrangement and modification of artificial teeth:

The teeth can be modified to harmonize with the patient's age, sex, and personality. The ways of are;(3,4)

1. Varying the direction of the long axis of teeth.
2. Place the maxillary lateral incisors tip show when the patient speaks seriously; the amount is less for old than for young people and could be more for woman than men.
3. Place one maxillary central incisor incisal edge slightly in an anterior direction to the other central incisor;
4. Create asymmetry in the divergences of the proximal surfaces of the teeth from the contact points.
5. Combined rotation of two central incisors with the distal surface forward, with one incisor depressed at cervical end & the other depressed incisally.
6. Can place one maxillary central and lateral incisor parallel to the midline and rotate the other central and lateral incisors slightly in a posterior direction.
7. Place the neck of one maxillary central incisor in a posterior direction and the neck of other central incisor in an anterior direction.8. By rotating the lateral incisors mesially, to have the vision of distal surface, the effect of the smile is hardened.
9. Create asymmetry for the maxillary right and left cuspids.
10. A hair line crack can be given in the teeth.
11. Use an eccentric midline.

A teeth arrangement with perfection may not be ideal. In fact, slight modifications such as overlapping, tilting, rotation and incisal variations may contribute to a natural-looking denture(5).

### Age changes

1. Gingival tissues recede with age.

2. Selecting a tooth long, wax contouring to show gingival recession and staining it, can give natural appearance, to reproduce recession. (7).
3. Teeth abrade with age, so grinding the incisal edges and Reshaping the incisal edges and mesiodistal diameter makes it possible to modify tooth to the desired form.
4. Spacing and diastemas often exist in natural dentition.so it can be created between the lateral incisor and the cuspid on one side. When providing diastemas smaller than 2-3 mm, fibrous food tends to be trapped in hence the sizing of diastema should be made with precision (8)

### Posterior teeth

1. Gold or alloy restorations can also be placed in teeth to create the naturalness.The use of gold occlusal surfaces on the teeth of prosthesis can contribute to its clinical success.(6)
2. Silver filling can be given on posterior teeth.
3. Cast crown can be given on posterior teeth.

### Shades

1. A discolored tooth like root canal treated can be shown by selecting a teeth of darker shade to rest of the teeth.
2. Older patients may have darker teeth as a result of discoloration from fillings and food stains.
3. Use light shades of teeth mold for young people and darker shades for older patients.

### Indication for characterization of denture base

1. Patients with an active upper lip.
2. Patients with a prominent pre-maxillary process.
3. Actors, singers and others who may expose gum tissues areas during their performances.
4. The psychological acceptance of the dentures by the patient. The smooth, pink, polished surface of an average acrylic denture quickly reveals it's false.

Copying gingival texture and contours contributes to the natural appearance of labial flanges in complete dentures by causing uneven reflection of light. This, also reduces the shine and reflection seen in highly polished denture flanges and provides a more natural appearance.

### Buccal surface of denture

Free gingivae or gingival margin, attached gingivae, interdental papillae, root eminences, the attachment of mucobuccal folds on the facial surfaces.

Excess grinding or polishing of the processed denture may remove the anatomic contours and staining.

The sulcus can be produced by probing a no. 23 explorer tip, between

the wax and tooth at the gingival margin moving it mesiodistally.

Free gingival margin can be carved flat and tight to the neck of the tooth, then blended directly to base material.

The gingival margin or free gingiva limits can be carved by removing wax from the cervical portion of teeth until sufficient areas of their labial and buccal surfaces are exposed.

The interdental papillae can also be left long and pointed for young patients but short and blunt for older patients.

#### **Alveolar eminence:**

To further enhance the natural effect, it is necessary to imitate the anatomy the gingivae and alveolus.

The labial flange of a complete denture should not be a smooth curved sheet of acrylic, but instead should show a series of swellings corresponding to the alveolar eminences over the roots of the teeth.

These are most marked anteriorly and become progressively less marked in the premolar and molar region.

In the upper anterior region, the canine eminence is most marked. The lateral incisor eminence is small. In the lower jaw, again the canine eminence is most marked and a series of smaller ridges mark the presence of the incisor roots.

Inflamed or bulbous gingiva: The reflection of inflamed or bulbous gingiva can also be reproduced by leaving more interdental wax.

#### **Stippling**

Stippling acts to blend the individual anatomic components and causes an uneven light refraction, which is an important factor contributing to naturalness [10].

Therefore, the surface of the denture base can be modified by Stippling: Lynn C. Dirksen described a procedure in obtaining more natural appearing buccal and labial contours for complete dentures.

The effect can be created by several ways on the dentures, like Offset bur technique [11], Toothbrush technique [9], Blow wax technique [12] and with the help of sponge [13].

The stippled surface produced by these plastic veneer forms enhances the esthetic appearance of plain pink acrylic resin. The ultimate esthetic result, however, is obtained by combining stippling and tinting.

#### **Palatal surface of denture**

The incisive papilla, rugae, lingual margin proximal to posterior teeth, the contour in approximation with the anterior teeth can be included Palatal surface are contoured, so that the patient can regain the sensation of contours present before the dentition loss.

In order to reproduce rugae, tin foil method is used, pattern is made before the base plate is secured to the cast.

This pattern is removed, two thicknesses are separated. The second layer, in apposition with the cast, is trimmed accurately and put aside until the lingual wax-up is carried out. The corresponding baseplate area is cut away at this time.

The thickness of wax on hard palate is reduced until the color of the cast just commences to become apparent through it as this creates minimal impingement on the tongue space by the vault surfaces. The tin-foil rugae pattern and its edges are then sealed & processed.

#### **Use of tints in the denture bases:**

Anatomic contouring will be incomplete without incorporating natural oral structure textures. To achieve, different coloring agents like ester and water soluble dyes, inorganic and organic pigments, internally colored polymers can be used.

Ideal requirements of denture base tinting materials (16):

1. It should be readily miscible with methyl methacrylate resin, non-toxic, stable and non-fading, resistant to loss from abrasion in cleaning and in normal function.

2. It should not alter the properties of the denture base resins, add appreciable bulk to denture bases.

Additional shades aside from the standard Tints can be mixed from earth color pigments which enables to match virtually any color of gingival tissue. Most widely used tints are the Kayon dental stains or tinting resins.

#### **Techniques for using tints are**

##### **Technique 1:**

This technique suggests initially trial packing the denture with a sheet of usual polyethylene sheets between the resin and the cast. After the trial closure, the flask is opened. The tints are applied with help of small camel's hairbrush wetted with monomer or by dusting and wetting with dropper on the external contours of the denture base and the imprints of the ridge-lap portions of the teeth.

##### **Technique 2:**

##### **Dusting and wetting.**

This technique has more wide acceptance, which involves applying the tints in outside to in, i.e. after dewaxing, different shades of resins are applied in different areas by dusting and wetting before filling the base with the resins. Place as minimal amount of monomer as necessary to barely wet the powder. Allow it to stand for about 15sec. before turning the flask. The intense colors should be restricted to the deeper veneers. And to stand for 10-15 minutes before packing the rest of mold. Simulating melanin pigmentation: This method involves the use of brown and purple resins for those with pigmented oral tissues.

Brush-on or paint-on technique-John L. Powers suggested that dusting and wetting technique is all-imaginary in the absence of the patient and its time consuming. Therefore, he developed a technique to apply the tinting material directly to the finished denture after processing, in the presence of the patient. He suggest that coloring of the denture varies from one patient to another. So, one cannot use the same color resins for each patient and the coloring of the denture base can be modified according to the tissue color of each patient.

Pound developed a technique where flexible acrylic veneer is made and can easily be adapted on denture surfaces during the packing operation [9, 18]. Kemnitzer [17] prompted the usage of Plastic or cellophane trial pack sheets, placed between the teeth and acrylic resin during packing. To simulate melanin pigmentation, use of brown and purple resins were suggested [15].

Powers developed a technique named as Brush-on or paint-on technique, applying tinting material directly to the finished denture after processing, in the presence of the patient. As coloring of the denture varies from one patient to another; so, one cannot use the same color resins for each patient and the coloring of the denture base should be modified according to the tissue color of each patient [18].

Pattanaik [19] described the usage of tissue paper for internal characterisation. They adapted a strip of tissue paper over the labial and buccal surface of the waxed up denture and cut according to the scalloping pattern of gingiva around teeth. Then, painted with acrylic pigments over this tissue paper according to the pigmentation pattern of the patient's gingiva. Then retrieving and applying it gently before packing and the procedure is carried out in conventional pattern.

Custom tinting is done at this time by increments of powder (color chosen according to the area where application is desired) along with placing monomer and keeping stains moistened with monomer to prevent crystallization. Later, acrylic resin stains are cured in the pressure pot or light-curing unit according to the manufacturers' instructions.

The clear coating brings a hard, high gloss which makes dentures polishing unnecessary. This coating seals the surface which promotes the color stability of the base and stains. Abrasion resistance of the base and custom staining should be improved. It is claimed that the coatings render the denture more wettable and retentive, and that urethane coatings may prevent allergic responses to poly-methyl methacrylate; but this cannot be confirmed. The technique initially involve slightly sandblasting the unpolished denture avoiding stained areas, then clean with detergent solution and dry with oil-free air. With the help of a soft clean brush, in thin even film coatings are then applied, painting in one

direction only to avoid air bubbles and then polymerize it.

Light cured gum shading are also available as they consists of micro filled composite resin which can be applied in multilayered technique and can delivers unlimited possibilities for gingival reproduction [22].

A modified bristle brush or toothbrush having two or three tufts at the end can be used for this purpose. By jabbing the wax on the surface in the selected region, a series of shallow holes are produced. The wax surface is then slightly flamed to reduce the depth of the holes and produce a dimpled effect. Finally, the surface polished lightly with water and cotton wool(23).

### Conclusion

Fabrication of complete dentures not only replaces the missing teeth but also restores the esthetics, phonetics and function.

Complete dentures characterisation is necessary for dentures to bring a life like appearance, to make it appear more natural.

Every denture should be characterized according to the each patient, rather than doing a pearl like arrangement of teeth with a twinkling, acrylic resin denture base which reveals it to be false and denture look. Our esthetic aim is to produce denture with anatomic characterization that present before loss of teeth.

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