

Materialistic Meets Realistic on Denture Characterization – A Case Report

Natarajan Muthuvignesh¹, Jeyaraj Brintha Jei^{1*}, Muthu Kumar Balasubramaniam¹

¹Department of Prosthodontics, SRM Dental College, Ramapuram, Chennai -600089, Tamilnadu, India.

Abstract

In completely edentulous patients the treatment challenges are associated with aesthetics, comfort, and function. As the oral hard and soft tissues are lost it may create a severe impact on the lower one third of the facial contour. So the rehabilitation of the lost structure must be done to improve the complete facial aesthetics. The two components that are important in denture aesthetics are denture teeth and the supporting denture base. Various solutions are available to restore comfort and function, but restoring the edentulous patient's aesthetic appearance is a mere challenge. Facial aesthetics and social integration of completely edentulous patient is significantly improved by using characterized denture when compared with a conventional denture. Once the patient's expectations are fulfilled it will impart a positive effect on the patient's self-esteem. So every complete denture patient must be evaluated individually and the dentist must strive to prepare a complete denture unique to that patient. The purpose of this case report is to provide unique denture characterization to fulfil patient aesthetic demands.

Keywords: Denture characterization, Pigments, Denture aesthetics, Complete denture

INTRODUCTION

A complete denture is a fixed or removable dental prosthesis that replaces the entire dentition and associated structures of the maxillae or mandible [1]. The main aim of a complete denture prosthesis in the edentulous patient is to restore the loss of oral hard and soft tissues with enhanced aesthetics, phonetics, and masticatory function [2]. The complete denture patients may get persuaded with the prosthesis that the dentist imparts. But it is the responsibility of the dentist to educate the patient that his or her complete dentures can be characterized to grace his/her wish and appear more natural than artificial [3]. Hence, the participation of the patient in treatment planning always plays a major role in treatment success for complete dentures [2]. The selection of accurate tooth size, shade, and position has a visual impact on a patient's appearance [4]. This will enhance the actual harmony and balance between the patient's smile and facial design. Each complete denture patient should be evaluated discretely, and the dentist should strive to make the complete denture unique to that person.

Complete dentures must be aesthetic as well as functional [5]. According to Hardy, "To meet the aesthetic needs of the denture patient, we should make the (denture) teeth look like (the patient's) natural teeth". Frush and Fisher stated that "the environment of the teeth should be as important as the tooth itself". Hence, both teeth and their supporting denture base are equally significant in determining the success and patient satisfaction [6].

For an aesthetic appearance of a complete denture, characterization of the denture plays a significant role. Additionally, giving appropriate contours and characterizing the denture bases can give a more natural and life-like appearance [7, 8]. Denture characterization is a modification of the form and color of the denture base and teeth to produce a more lifelike appearance [2]. Characterization helps the dentist to incorporate his artistic skills along with theoretical knowledge in the fabrication of dentures. The characterization should have some amount of realistic perception rather than incorporating unrealistic features [3]. A complete denture can be characterized by various methods which will be discussed in this case report.

Case Report

A 67-year-old patient reported to the department with a chief complaint of missing teeth in both the arches for the past ten years she was a complete denture wearer for the past ten years

Address for correspondence: Jeyaraj Brintha Jei, Department of prosthodontics, SRM dental college, Ramapuram, Chennai - 600089, Tamilnadu, India. brinthajei@yahoo.co.in

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and was unhappy with her existing denture as it looks more artificial. She is diabetic and under medication for the past five years and underwent extractions before ten years due to caries and periodontal problems. On intra-oral examination, she was completely edentulous in both the arches and the buccal mucosa, gingiva is highly keratinized.

A primary impression was made with impression compound and diagnostic casts were obtained using plaster of Paris (Dentico, Jodhpur). A Wax spacer was adapted to the casts. Over which, the custom tray was fabricated using auto polymerizing acrylic resin (DPI, Mumbai) for both maxillary and mandibular arches. The custom tray was evaluated intraorally and functional movements were performed and border molding was carried out using a green stick compound (DPI Pinnacle, India). A definitive impression was made with zinc oxide eugenol impression paste (DPI Impression paste, Mumbai) after the removal of the wax spacer and relief holes were made in the custom tray. Then the tray was beaded and boxed, onto which the dental stone (Neelkanth stone plaster, Jodhpur) was poured to make master casts. Temporary Denture bases were fabricated with auto polymerizing acrylic resin, wax rims (Hindustan Modelling wax, Hyderabad) were made and jaw relation was recorded and articulated in a semi-adjustable articulator (**Figure 1**). Teeth arrangement (Acryrock Ruthinium teeth, New Delhi) was done and the wax trial was evaluated in the patient's mouth. Festooning and finishing were completed. During the flasking procedure, after the first pour putty was adapted over the wax and denture base, and the second pour is poured. Then, it was dewaxed.



Figure 1. Jaw relation in patient

Sectional characterization of both maxillary and mandibular dentures was done using heat cure denture characterization pigments (Milestone Healthcare, Chhattisgarh) (**Figure 2**). For this, a small quantity of monomer is dispensed into a dappen dish, and the pigments were mixed with the basic color i.e. clear acrylic. Four color shades (melanin, brown, red and yellow) were obtained for marginal gingiva, interdental papilla, attached gingiva, root surfaces, and denture base by adding the characterization pigments in heat cure acrylic monomer. They were applied via a small

hairbrush layer by layer in their respective positions onto the mold space and wetted frequently with heat cure monomer or by dusting and wetting with a dropper. Then, it was packed with heat cure acrylic resin, and curing was done. Dentures were retrieved, and finishing and polishing were done. Followed by denture insertion was carried out and post-insertion instructions were given to the patient (**Figure 3**). After 24 hrs denture review was done and the patient was highly satisfied with the aesthetics, phonetics, and mastication (**Figure 4**). Further follow-up was carried out after 1 week, third month, and sixth month.



Figure 2. heat cure denture characterization pigments (melanin, brown, red, yellow) and instruments for characterization



Figure 3. Characterised dentures in patient's mouth



Figure 4. Post-operative view

RESULTS AND DISCUSSION

A complete denture can be characterized by two basic methods.

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

Characterization of the Denture Bases – Pound was the first person to experiment with a method of tinting acrylic denture bases by incorporating the racial and individual color peculiarities, of the gingiva to simulate the gingival color in artificial denture during 1951 [9, 10]. Whereas Pattanaik used tissue paper for staining on the waxed-up trial denture [7]. Kemnitzer combined blue and brown stains to reproduce the melanotic pigmentation of the gingiva [11-14]. Lynn C Dirksen advocated plastic veneer from stippling on the labial and buccal surface of dentures. This reduces the reflection and shine in polished denture labial and buccal flanges and enhances a more natural aesthetic appearance.

Denture characterization is indicated in patients with the eminent pre-maxillary process, with active upper lip, patients with psychological acceptance, and celebrative patients. The basic requirements of denture base tinting materials are, that they should be non-toxic, stable, no color change, easily miscible with methyl methacrylate resin, resist abrasion during hygiene maintenance, and should not alter properties of denture base resin, and should not increase bulk to the denture [12]. The advantages of this technique are that the stains are incorporated deeply into the denture and they will not be easily removed by subsequent grinding procedures during the finishing and polishing of the denture. It allows the use of putty as it prevents impregnation of the plaster into the

acrylic resin. As the tinting is done directly during the packing of the heat cure denture base resin, it minimizes surface porosities and the operator has control over the extent of the tint [15, 16].

CONCLUSION

Denture characterization is an art that should be prioritized during treatment planning aids the patient in developing proper speech, and enhanced aesthetics and may have dramatic, social, and psychological benefits for these patients. Meeting patients' expectations by giving importance to their demands is the most important criterion for success. This will have a positive effect on the patient's self-esteem. Denture characterization provides infinite possibilities for the dentist to add his signature to his work and make complete denture practice interesting, challenging and rewarding.

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REFERENCES

1. Ferro KJ, Morgano SM, Driscoll CF, Freilich MA, Guckes AD, Knoernschild KL, et al. The glossary of prosthodontic terms. *J Prosthet Dent.* 2017;117(5S):e1-105.
2. Hirsch B, Levin B, Tiber N. Effects of patient involvement and esthetic preference on denture appearance. *J Prosthet Dent* 1972;28(2):127-32.
3. Nanda S, Pasricha N, Sadana V, Mann N, Nanda T. Complete Dentures-Out of the ordinary. *J Indian Dent Assoc.* 2016:27-34.
4. Engelmeier RL. Complete-denture esthetics. *Dent Clin North Am.* 1996;40(1):71-84.
5. Hardy IR. Problem-solving in denture esthetics. *Dent Clin North Am.* 1960;4(2):305-20.
6. Frush JP, Fisher RD. How dentogenic restorations interpret the sex factor. *J Prosthet Dent.* 1956;6(2):160-72.
7. Pattanaik S, Pattanaik B. Internal Characterization of Denture Base by Using Acrylic Stains and Tissue Paper. *J Indian Prosthodont Soc.* 2011;11(3):202-4.
8. Zimmerman DE, Pomerantz JM, Sanfacon DG, Berger AW. Denture esthetics (III), Denture base color. *Quintessence Int Dent Dig.* 1982;13(7):747-58.
9. Johnson HD. Technique for packing and staining complete or partial denture bases. *J Prosthet Dent.* 1956;6(2):154-9.
10. Pound E. Esthetic dentures and their phonetic values. *J Prosthet Dent.* 1951;1(1-2):98-111.
11. Chandna A, Nedal A, Kalra T, Rana Y, Yadav A, Jindal A. Characterization of complete denture: A Review. *J Dent Med Sci.* 2016;15(9):133-5.
12. El Meligy O, Bahannan S, Hassan M, Elteley S, Kayal R, Qutob A, et al. Oral Health Status and Habits among 6-13 Years Old Children with Limited Access to Dental Care in South Jeddah. *Int J Pharm Res Allied Sci.* 2019;8(3):109-18.
13. El Ashiry EA, Alamoudi NM, Farsi NM, Al Tuwirqi AA, Attar MH, Alag HK, et al. The Use of Micro-Computed Tomography for Evaluation of Internal Adaptation of Dental Restorative Materials in Primary Molars: An In-Vitro Study. *Int J Pharm Res Allied Sci.* 2019;8(1):129-37.
14. Jahanmoghadam F, Farokh Gisour E, Askari R, Rad M. Attitude Regarding Dental Stem Cells among Dental Practitioners in Kerman, Iran. *Arch Pharm Pract.* 2018;9(3):10-3.
15. Alamri AM, Alshammery HM, Almughamis MA, Alissa AS, Almadhi WH, Alsharif AM, et al. Dental Recession Aetiology, Classification and Management. *Arch Pharm Pract.* 2019;10(2):28-31.

16. Parakh MK, Krishna Prasad D. Customised Aesthetic Maxillary Complete Denture Prosthesis Using Characterization- A Case Series. *Ann Dent Spec.* 2020;8(3):9-12.