

Characterization of Complete Dentures Using Patient's Intraoral Photograph: (A Case Report)

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Abstract

Characterization of dentures allows for a more acceptable final prosthesis. Current characterization techniques require skill and understanding of various color dynamics for the fabrication of satisfactory esthetic denture prostheses. This technique allows the operator to have more control over the colors and unique characteristics of each patient and efficiently replicate them. To illustrate this technique, a printed close of an intraoral photograph of the arch was used to characterize a maxillary complete denture prosthesis.

Keywords: Characterized denture, Characterization, Internal characterization.

1. Introduction

Esthetic appearance of a complete denture is dependent as much on the denture base as on the denture teeth being used. Characterization of denture base lends a life-like character to the otherwise lifeless prosthesis. Multiple methods of characterization of dentures have been reported in literature including brush-on technique using pigment impregnated polymer- monomer combination during packing of denture, using custom pigmented veneers and using custom pigmented tissue paper as a mode of internal characterization. However, these techniques require above average technical skills to be completely satisfactory. The laboratory technique described in this article simplifies characterization by using patient's intraoral photographs to replicate the complex color combination which is found in each individual's mouth, thus leaving no scope for error. [1,3,9]

Historically, authors like Pound [5] and Kemnitzer [2] emphasized the role of the denture base in overall facial esthetics. However, many of these techniques demand advanced technical skills and a deep understanding of color theory to achieve satisfactory results. More recent approaches have focused on addressing the specific needs of diverse populations [4] and ensuring long-term color stability [6, 7]. The technique described herein simplifies the process by using the patient's own intraoral clinical photograph to guide the replication of mucosal tissues, thereby minimizing human error and artistic guesswork [8, 10, 16].

2. Technique

1. **Try-in:** Perform the trial insertion of the waxed-up, contoured denture (Figure 1). Obtain patient consent for the characterization procedure once aesthetics and phonetics are finalized.



Figure1: Waxed up denture.

2. **Photography:** Capture a high-resolution, close-up photograph of the patient's edentulous arches (Figure 2). Print this image on plain white paper using a laser printer.



Figure2: Close up photograph of patient.

3. **Preparation:** Trim the photograph precisely along the gingival contours using the trial denture as a guide. Seal the cut-out photograph using two layers of decoupage glue to protect the ink from monomer seepage and heat during polymerization (Figure 3, Figure 4) [13].



Figure 3: Printed photograph cut according to denture's gingival contours



Figure 4: Cut photograph post sealed with resin.

4. **Investing:** Invest the denture in the standard manner. After dewaxing, apply a tinfoil substitute to the exposed stone surfaces.
5. **Placement:** Adapt a thin layer of clear heat-polymerizing PMMA over the buccal aspect. Carefully tack the sealed photograph onto this clear layer, followed by packing the remaining denture space with pink heat-polymerizing PMMA (Figure 5A, B) [15].



Figure 5a and 5b.: Thin layer of clear PMMA adapted on the buccal aspect. Photograph embedded against clear acrylic followed by pink PMMA packing. (Both Maxillary and Mandibular Arch.)

6. **Processing:** Process the denture according to the standard short polymerization cycle [7, 15].
7. **Finishing:** Retrieve, finish, and polish the denture (Figure 6).



Figure 6: Finished and polished customized denture.

8. **Delivery:** Perform final adjustments and deliver the finished prosthesis (Figure 7).



Figure 7: Delivery of the finished customized denture and intraoral view in patient.

3. Discussion

In this technique the outermost layer determines the intensity of the characterization. The thickness of outmost clear acrylic is paramount to the success of the natural shades of patient's intraoral mucosal picture showing through.[11]. 7It is advisable to use a print color intensity that exactly mimics the intraoral condition or to use a darker shade if extra thickness of clear acrylic is necessary for reinforcement of the dentures buccal flange. [9]

The decoupage glue which is used in this technique, effectively seals the complete picture and protects it against external agents such a residual monomer and heat which is derived while polymerization process is taking place. [13,14] Also, upon drying the decoupage glue becomes completely clear and has a glossy appearance further enhancing the esthetics of the picture print. It is advisable to use two layers of decoupage glue, so that adequate thickness of the protective layer is formed. Precise matching of patient's intraoral mucosal tints requires skillful mastery of colors and mixing thereof. [7]

Another major factor is the time involved in obtaining acceptable level of characterization through tinting. Although using pigments can yield excellent results when done by a capable clinician/technician, true replication would require a lot of effort in mimicking the intricacies of natural mucosa. Hence, it is the inherent advantage of this technique, by providing exact replication of intraoral situation also being much more efficient and removing the guesswork from the process. [6,15]

Although this technique can be very useful in providing characterization, the inherent disadvantages lie in noncompliance with proper protocol. [1,16] It is heavily dependent on the decoupage glue for sealing it against agents which might otherwise cause the pigments to leech out and give an unesthetic appearance. Also, precise position of the cut out is extremely important in when using this technique, otherwise failures in the form of paper extrusion or crimping can be expected. [8,12]

4. Summary

The prime advantage of the technique described in this article is the true replication of patient's mucosal color characteristics. This technique does not require any mixing or special technical skills when trying to mimic complex intraoral complexion, hence speculation regarding the same is completely avoided.

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