

Case Report

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Fabrication of A Highly Esthetic Complete Denture Using the Existing Denture as A Custom Impression Tray: A Clinical Case Report

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Abstract

The rehabilitation of edentulous patients who have been wearing the same complete dentures for prolonged periods presents unique clinical challenges. Long-term denture use is frequently associated with residual ridge resorption, loss of tissue support, compromised retention and stability, altered vertical dimension, and diminished esthetics. This case report describes the prosthodontic management of an elderly female patient who had been using the same set of complete dentures for approximately 25 years and sought replacement with a new prosthesis. To preserve the patient's familiar denture contours and neuromuscular adaptation while obtaining an accurate impression, the existing dentures were utilized as custom impression trays. Border molding was performed using addition silicone putty, followed by a final wash impression with light-body elastomeric material. Jaw relations were recorded, esthetic parameters were carefully evaluated, and a highly esthetic complete denture was fabricated and delivered. The treatment resulted in improved retention, stability, function, facial support, and patient satisfaction. The technique demonstrated a simple, economical, and clinically effective method for complete denture replacement in long-term denture wearers.

Keywords: complete denture; denture replacement; edentulism; existing denture impression technique; prosthodontic rehabilitation; residual ridge resorption

Introduction

Edentulism remains a significant oral health concern worldwide, particularly among elderly individuals. Complete dentures continue to be the most commonly employed treatment modality for restoring function, esthetics, and phonetics in completely edentulous patients despite the growing popularity of implant-supported prostheses [1,2]. Long-term use of complete dentures may result in progressive residual ridge resorption, occlusal wear, loss of retention and stability, decreased masticatory efficiency, and compromised facial appearance [3]. Clinical studies have reported that complete dentures should be periodically evaluated and replaced when they no longer adequately satisfy functional and esthetic requirements [4].

The fabrication of replacement dentures poses several challenges, especially in patients who have successfully adapted to their old prostheses over many years. Conventional impression procedures may alter denture-bearing anatomy and polished surface

contours to which the patient has become accustomed. Utilizing the existing denture as an impression tray allows preservation of favorable extensions, flange contours, and occlusal relationships while simultaneously recording functional denture-bearing tissues [5,6]. The present case report describes the fabrication of a highly esthetic complete denture in a patient who had worn the same complete dentures for 25 years. An existing denture impression technique involving putty border molding and light-body wash impression was employed to achieve optimal retention, stability, and patient satisfaction.

Case Presentation

Patient History

A female patient reported to the Confidential Multi-specialty Dental and Orthodontic Clinic, Sahibzada Ajit Singh Nagar (Mohali), Punjab, India with the chief complaint of worn-out complete dentures and dissatisfaction with her facial appearance during

smiling and speaking. The patient stated that she had been wearing the same maxillary and mandibular complete dentures for approximately 25 years.

Medical history was non-contributory, and no contraindications to prosthodontic treatment were identified. The patient expressed a desire for a new set of complete dentures that would provide improved esthetics while maintaining comfort and function.

Clinical Examination

Extraoral examination revealed reduced lower facial height, inadequate lip support, and signs of aging associated with loss of vertical dimension. The patient exhibited acceptable neuromuscular control and was well adapted to her existing dentures.

Intraoral examination revealed completely edentulous maxillary and mandibular arches with generalized residual ridge resorption. The existing dentures demonstrated:

- Significant occlusal wear of artificial teeth.
- Loss of esthetic characteristics.
- Reduced retention and stability.
- Deterioration of denture base adaptation.
- Staining and surface roughness.

However, the extensions and polished surface contours of the existing dentures were clinically acceptable and had contributed to the patient's long-term adaptation.

Treatment Plan

A new set of complete dentures was planned using the patient's existing dentures as custom trays for definitive impression making. The objectives of treatment were:

1. To obtain accurate functional impressions.
2. To preserve favorable denture extensions and muscle balance.
3. To improve retention and stability.
4. To restore facial support and esthetics.
5. To provide a prosthesis closely adapted to the patient's neuromuscular pattern.

Clinical Procedure

Existing Denture Evaluation and Preparation

The existing maxillary and mandibular dentures (Figures 1-3) were cleaned and examined for extension, stability, and adaptation. Relief holes were created where necessary to facilitate impression material escape and prevent hydraulic pressure.



Figure 1: Previous complete dentures - in patient's mouth.



Figure 2: Previous complete dentures - Occlusal view.



Figure 3: Previous complete dentures - Intaglio view.

Border Molding

Border molding was performed using single-step technique i.e. using putty viscosity elastomeric impression material (Zhermack Elite HD+ Putty Soft,

Zhermack SpA, Italy) (Figure 4). Functional movements including smiling, speaking, puckering, cheek manipulation, tongue movements, swallowing, and mouth opening were performed to record functional vestibular extensions.

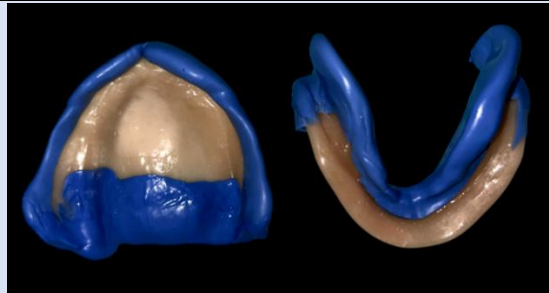


Figure 4: Border molding procedure - Maxillary and mandibular.

The putty border molding procedure enabled accurate recording of the peripheral tissues while preserving the favorable contour of the existing dentures.

Final Impression

Following border molding, a light-body addition silicone wash impression was made inside the existing

dentures using the light-bodied material (Zhermack Elite Hd+ Light Body, Zhermack SpA, Italy) to ensure optimal detail reproduction and dimensional stability (Figure 5). The dentures were seated intraorally under controlled pressure, and the patient was instructed to perform functional movements.

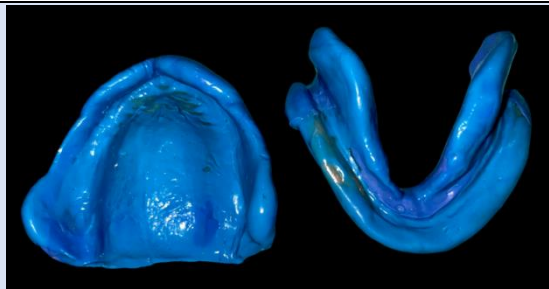


Figure 5: Final impressions - Maxillary and mandibular.

The final impressions demonstrated:

- Accurate peripheral seal.
- Uniform tissue adaptation.
- Well-defined vestibular extensions.
- Detailed recording of denture-bearing tissues.

Jaw Relation Records

Master casts were obtained, and record bases with occlusion rims were fabricated. Vertical dimension of occlusion was established using facial measurements, phonetics, esthetics, and physiologic rest position. Centric relation was recorded and verified (Figure 6). The patient's previous denture parameters were evaluated and modified to achieve improved esthetics and functional efficiency.



Figure 6: Jaw relation record.

Teeth Arrangement and Try-In

Artificial teeth were selected according to age, gender, facial form, complexion, and patient preferences. Particular attention was directed toward:

- Incisal display.
- Midline orientation.
- Smile line.

- Buccal corridor support.
- Lip support.

A trial denture evaluation was performed (Figure 7). The patient expressed satisfaction regarding appearance, phonetics, and comfort.



Figure 7: Wax try-in.

Denture Processing and Delivery

The dentures were processed using heat-polymerized acrylic resin following conventional laboratory procedures. Finishing and polishing were completed, and the dentures were inserted.

Clinical evaluation demonstrated:

- Improved retention and stability.
- Enhanced facial support.
- Balanced occlusion.
- Improved phonetics.
- Superior esthetics compared with the previous prosthesis.

Post-insertion instructions regarding hygiene, maintenance, and adaptation were provided. Follow-up visits were scheduled at 24 hours, one week, and one month.

Treatment Outcome

The patient reported substantial improvement in:

- Comfort.
- Mastication.
- Speech.
- Facial appearance.
- Overall confidence.

No significant sore spots or occlusal discrepancies were observed during follow-up appointments (Fig 8).



Figure 8: Postoperative smile - Happy and satisfied patient.

Discussion

The successful rehabilitation of edentulous patients depends upon accurate impression procedures, proper jaw relation records, balanced occlusion, and appropriate esthetic considerations [1,7]. Residual ridge resorption is a chronic, progressive, and irreversible condition that continues throughout life after tooth loss [3]. Consequently, dentures fabricated

decades earlier often become ill-fitting due to changes in the supporting tissues. Studies have shown that prolonged use of old dentures may negatively affect oral function and quality of life [4]. The existing denture impression technique has been advocated as a practical approach for replacement dentures because it preserves the favorable characteristics of the old prosthesis while correcting deficiencies in adaptation and tissue support [5]. Schiesser described the concept

of utilizing existing dentures as impression trays to maintain established neuromuscular patterns and facilitate patient adaptation to new prostheses [6]. Functional border molding remains critical for achieving peripheral seal and denture retention [7]. The use of addition silicone putty offers dimensional stability, ease of manipulation, and accurate recording of dynamic soft tissue movements. Furthermore, light-body elastomeric wash materials provide excellent surface detail reproduction and dimensional accuracy [8]. The esthetic success of complete dentures depends on careful evaluation of facial morphology, lip support, smile characteristics, tooth selection, and arrangement [9]. In the present case, restoration of proper vertical dimension and enhancement of facial support contributed significantly to the improved esthetic outcome. Several authors have reported that duplication or modification of existing dentures can reduce patient anxiety and facilitate acceptance of new prostheses because familiar contours are maintained [5,10]. This concept was particularly relevant in the present patient, who had adapted to the same dentures for 25 years.

The technique employed in this case offers several advantages:

- Reduced chairside time.
- Preservation of successful denture contours.
- Improved patient acceptance.
- Accurate functional impression making.
- Cost-effectiveness.
- Enhanced retention and stability.

However, the technique should only be used when the existing dentures possess acceptable extensions and polished surface anatomy. Severely defective dentures may require conventional impression procedures.

Conclusion

The use of existing complete dentures as custom impression trays represents a predictable and efficient method for fabricating replacement complete

dentures in long-term denture wearers. Putty border molding combined with a light-body wash impression enables accurate recording of functional denture-bearing tissues while preserving favorable denture contours. In the present case, the technique facilitated the fabrication of a highly esthetic complete denture with excellent retention, stability, function, and patient satisfaction. The approach may be considered a valuable treatment option for edentulous patients seeking replacement dentures after prolonged prosthesis use.

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