

# Prosthodontic Rehabilitation with a Single Maxillary Complete Denture Using Esthetic and Functional Modifications: A Case Report

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## ABSTRACT

Rehabilitation of a single maxillary complete denture opposing natural mandibular dentition remains a prosthodontic challenge due to unfavourable occlusal dynamics, esthetic demands, and increased risk of denture instability and fracture. Elderly patients often present with complex clinical conditions that necessitate individualized treatment planning rather than routine complete denture protocols. This case report describes the prosthodontic rehabilitation of a 78-year-old male patient with a completely edentulous maxillary arch opposing a dentulous mandibular arch. A combination of esthetic and functional modifications—including occlusal scheme customization, selective denture base contouring, and denture tooth characterization—was incorporated to enhance denture stability, facial harmony, and patient satisfaction. The clinical outcome demonstrates that thoughtful modification of conventional techniques can result in predictable functional efficiency and improved esthetics in single maxillary complete denture cases.

**Keywords:** Single Complete Denture, Natural Dentition, Esthetic Modification, Occlusal Harmony, Case Report

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## INTRODUCTION

Fabrication of a single complete denture opposing natural dentition is widely recognized as one of the most demanding and biologically challenging clinical situations in complete denture prosthodontics<sup>1</sup>. Unlike conventional complete dentures, where occlusal forces are distributed between two prostheses, a single complete denture must function against an uncompromising natural dentition, often resulting in increased functional stress on the denture base and supporting tissues<sup>2</sup>. If not meticulously planned and executed, such cases are frequently associated with denture instability, accelerated residual ridge resorption, occlusal disharmony, frequent post-insertion adjustments, and an increased incidence of denture fracture<sup>3,4</sup>.

The presence of natural mandibular teeth introduces significantly higher occlusal loads and complex functional dynamics compared to complete denture–complete denture situations<sup>5</sup>. Parafunctional habits, occlusal discrepancies, and uneven force distribution further complicate treatment outcomes in single maxillary complete denture cases<sup>6</sup>. Additionally, patients with retained natural teeth often have heightened esthetic expectations, as the prosthesis must blend harmoniously with existing dentition in terms of tooth form, shade, and arrangement<sup>7</sup>. These factors cannot be adequately addressed using routine complete denture protocols and necessitate modifications based on biomechanical and esthetic considerations<sup>8</sup>.

Previous literature has consistently emphasized the importance of careful diagnosis, occlusal scheme selection, selective occlusal adjustment, and appropriate denture tooth morphology to ensure long-term success of single complete dentures opposing natural teeth<sup>9,10</sup>. Esthetic characterization of denture teeth and denture base has also been advocated to improve patient acceptance, particularly in elderly individuals where facial musculature, lip support, and age-related tissue changes play a crucial role in prosthesis success<sup>11,12</sup>. Despite these recommendations, standardized clinical guidelines remain limited, and many cases require individualized treatment planning tailored to the patient's functional demands and esthetic needs<sup>13</sup>.

This report presents a special clinical case of prosthodontic rehabilitation with a single maxillary complete denture in an elderly patient with a dentulous mandibular arch. The case highlights the use of specific esthetic and functional

modifications aimed at achieving occlusal harmony, denture stability, and facial balance while maintaining patient comfort and satisfaction<sup>14, 15</sup>.

### CASE REPORT

A 78-year-old male patient reported to the Department of Prosthodontics with the chief complaint of difficulty in mastication and dissatisfaction with facial appearance due to the absence of maxillary teeth. Such complaints are commonly reported by completely edentulous patients and significantly affect oral health-related quality of life<sup>16</sup>. The patient expressed concerns regarding reduced chewing efficiency, impaired speech, and a progressively collapsed facial profile following tooth loss. The dental history revealed that the patient had been edentulous in the maxillary arch for approximately two years and had not used any form of prosthesis during this period, a factor known to exacerbate ridge resorption and esthetic compromise<sup>17</sup>.

The mandibular arch was dentulous, with natural teeth present in functional occlusion. The patient did not report any history of trauma or parafunctional habits. Medical history was non-contributory, with no systemic conditions or medications that could adversely influence prosthodontic treatment outcomes. No signs or symptoms related to temporomandibular joint dysfunction were reported, such as pain, joint sounds, or limitation of mandibular movements, which is an important consideration in single complete denture therapy<sup>18</sup>.

#### Clinical Examination

Extraoral examination revealed reduced lip support, mild perioral wrinkles, and a collapsed mid-facial profile suggestive of a loss of vertical dimension of occlusion, findings commonly associated with long-standing edentulism<sup>19</sup>. The nasolabial folds appeared accentuated, and the lips lacked adequate anterior support at rest, indicating the need for prosthetic restoration of facial contours. Facial symmetry was within normal limits, and mandibular movements were smooth, coordinated, and unrestricted.

Intraoral examination of the maxillary arch revealed a completely edentulous ridge with moderate residual ridge resorption. The ridge was well-formed and rounded, covered with healthy and resilient mucosa, providing favourable conditions for support and retention of a complete denture<sup>20</sup>. The palatal vault was of average depth, and no flabby tissue, sharp bony undercuts, or mucosal pathology was detected.

The mandibular arch exhibited natural teeth with generalized occlusal wear consistent with the patient's age. The teeth showed stable periodontal support, with no clinical mobility or signs of active periodontal disease. However, the uneven occlusal plane due to attrition was noted, which can adversely influence occlusal harmony and stability of a single complete denture if not properly managed<sup>21</sup>.

#### Treatment Planning

Based on the clinical findings, various treatment options were discussed, including implant-supported prosthesis, tooth-supported overdenture concepts, and conventional removable prosthodontic rehabilitation. Implant-supported rehabilitation has been shown to improve outcomes in single complete denture cases<sup>22</sup>. However, it was declined by the patient due to advanced age, financial constraints, and preference for a non-surgical approach.

Therefore, fabrication of a single maxillary complete denture opposing a dentulous mandibular arch was planned. The primary objectives of treatment were to restore masticatory efficiency, re-establish vertical dimension of occlusion, improve facial esthetics, and achieve occlusal harmony with the opposing natural dentition while minimizing lateral and destabilizing forces acting on the denture base<sup>23</sup>. The patient was informed about the inherent challenges associated with single complete denture therapy and provided informed consent for the proposed treatment plan.

#### Clinical Procedure

Primary impressions of the maxillary arch were made using impression compound to record the overall anatomy of the denture-bearing area, as recommended for preliminary assessment in complete denture fabrication<sup>24</sup>. Diagnostic casts were poured in dental plaster and evaluated to assess ridge morphology, palatal contours, and potential undercut areas. Custom impression trays were fabricated using autopolymerizing acrylic resin, ensuring uniform spacing for impression material.

Border molding was performed using low-fusing green stick compound to accurately record the functional depth and width of the vestibule, which is critical for achieving optimal peripheral seal<sup>25</sup>. Secondary impressions were made using zinc oxide eugenol impression paste to obtain a detailed and mucostatic impression of the maxillary denture-bearing tissues, a technique widely advocated for well-formed residual ridges<sup>26</sup>.

Maxillomandibular relationship records were obtained using occlusion rims fabricated on stable record bases. Careful verification of vertical dimension of occlusion was performed using facial measurements, phonetic evaluation, and

assessment of interocclusal rest space<sup>19</sup>. Centric relation was recorded with special attention to accuracy and repeatability, considering the presence of opposing natural teeth<sup>18</sup>.

A semi-anatomic occlusal scheme was selected to reduce horizontal and lateral forces transmitted from the mandibular natural dentition to the maxillary complete denture<sup>10</sup>. Denture teeth were selected to harmonize with the size, form, and shade of the existing mandibular teeth. During the try-in stage, tooth arrangement was evaluated for esthetics, phonetics, and occlusal balance. Particular emphasis was placed on restoring adequate lip support without producing excessive labial fullness, which could compromise facial esthetics<sup>15</sup>.

Selective grinding was carried out at the try-in stage to eliminate premature contacts and achieve even bilateral contacts in centric relation, with minimal interferences during eccentric movements<sup>9</sup>. Esthetic characterization was achieved through subtle modification of denture tooth shade and gingival contouring to simulate natural oral tissues, thereby improving patient acceptance and blending of the prosthesis with age-related facial features<sup>11</sup>.

The denture was processed using heat-polymerized acrylic resin following the conventional compression molding technique. After deflasking, finishing, and polishing, the prosthesis was remounted for occlusal equilibration<sup>8</sup>. The completed maxillary complete denture was delivered, and post-insertion instructions were provided.

## DISCUSSION

Rehabilitation with a single maxillary complete denture opposing natural dentition presents significant biomechanical and esthetic challenges due to the inherent disparity between resilient denture-bearing tissues and the rigid, non-yielding nature of natural teeth<sup>1,5</sup>. The occlusal forces generated by natural dentition are greater in magnitude and more concentrated, predisposing the maxillary denture to instability, tipping, and uneven stress distribution<sup>2,23</sup>. If these unfavourable forces are not adequately controlled, they may result in patient discomfort, accelerated residual ridge resorption, and frequent post-insertion adjustments<sup>3</sup>.

The presence of a dentulous mandibular arch introduces complex functional dynamics, including parafunctional contacts and occlusal discrepancies caused by attrition and uneven occlusal planes<sup>6</sup>. Such factors increase the risk of occlusal disharmony and denture displacement during functional movements, emphasizing the need for meticulous occlusal assessment<sup>9</sup>.

Previous literature supports the use of individualized occlusal schemes, selective occlusal adjustment, and appropriate denture tooth morphology to improve prognosis in single complete denture cases<sup>9,10</sup>. Semi-anatomic cusp forms have been advocated to reduce lateral forces while maintaining masticatory efficiency<sup>14</sup>.

Esthetic considerations are particularly important in elderly patients, where age-related changes such as reduced lip support, perioral wrinkling, and altered muscle tone influence prosthesis acceptance<sup>11,16</sup>. The present case supports existing evidence that esthetic characterization enhances psychological comfort and patient satisfaction<sup>12</sup>.

This case emphasizes a combined functional–esthetic approach consistent with contemporary patient-centred prosthodontic philosophy, where prosthesis design is individualized rather than standardized<sup>13,15</sup>.

## CONCLUSION

Effective rehabilitation of a single maxillary complete denture opposing natural dentition depends on accurate diagnosis, patient-specific treatment planning, and judicious modification of conventional prosthodontic concepts. Integration of functional and esthetic modifications plays a crucial role in enhancing denture stability, restoring facial balance, and improving patient satisfaction. This case demonstrates that reliable clinical outcomes can be achieved in challenging situations when evidence-based prosthodontic principles are applied in a systematic and individualized manner.

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### Author Biography

**Shrawani Vitthal Sodnawar** is a fourth-year undergraduate student in the Department of Prosthodontics, School of Dental Sciences, Karad, with an academic interest in complete denture prosthodontics and geriatric oral rehabilitation.

**Dr. Ajay Gaikwad** contributed to the conceptualization of the case management plan, clinical supervision during diagnosis and treatment procedures, and critical review of the manuscript for intellectual content. He provided guidance throughout the preparation and refinement of the case report and approved the final version for submission.

#### Conflict of Interest

The author declares no conflict of interest.

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#### Photographs:



**Edentulous Maxillary Arch**



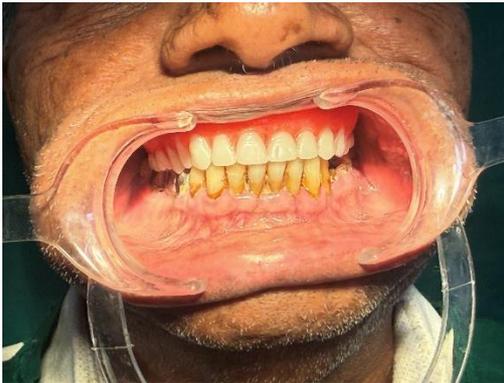
**Maxillary Primary Impression**



**Maxillary Final Impression**



**Jaw Relationship Recording**



**Try-In of Waxed-up Dentures**



**Maxillary Denture Insertion**