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Prosthodontic Rehabilitation of a Patient with Worn Removable Prostheses

Case Report

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Introduction

Excessive wear of removable prostheses in edentulous patients can result in loss of vertical dimensions of occlusion (VDO), impaired esthetics, functional limitations, and reduced patient comfort [1,2]. Implant-supported mandibular overdentures are considered a predictable option for edentulous rehabilitation, providing improved stability, retention, and patient satisfaction compared with conventional complete dentures [3]. However, long-term use is often associated with complications such as attachment wear, prosthetic tooth wear, and denture base fractures, necessitating maintenance or replacement [4-6]. Rehabilitation of patients with severely worn prostheses requires careful assessment of VDO, often through multiple clinical methods to avoid inaccuracies caused by altered neuromuscular tone [7-9]. In addition, reinforcement of implant-supported overdentures may be indicated to withstand occlusal forces and stress concentrations around attachments [10,11]. This case report describes the prosthetic management of a patient with a maxillary complete denture and a mandibular implant-supported overdenture with excessive prosthetic wear, highlighting the clinical procedures used to restore VDO, occlusal balance, and esthetics.

Case Presentation

A 72-year-old female in good general health (ASA I) presented with decreased chewing efficiency and dissatisfaction with the esthetics of her existing dentures (Figure 1). Clinical examination revealed a maxillary complete denture and a mandibular implant-supported overdenture retained by four external hexagon implants (Biomet 3i, LLC), both in service for approximately 25 years. The prosthetic teeth were severely worn, in some areas almost through the denture base (Figures 2,3). Retentive inserts had lost their function (Figure 4), although the implants were clinically stable and radiographically sound (Figure 5).

The treatment plan included fabrication of a new maxillary complete denture and a mandibular implant-supported overdenture with new Locator abutments (Zest Anchors, Carlsbad, CA). Preliminary impressions were made, followed by custom trays and final impressions with medium-body polyvinyl siloxane (Aquasil, Dentsply-Sirona). Locator housings were incorporated during the mandibular impression to accurately transfer their position to the master cast, reducing chairside adjustment. Record bases and wax rims were fabricated. The VDO was established using multiple methods, including phonetics, esthetics, and vertical dimension at rest (VDR), to account for altered muscle tone from worn prostheses [7-9]. Trial tooth arrangement was performed, and a metal framework was incorporated in the mandibular overdenture to reinforce areas of attachment stress [10,11].

At delivery, pressure indicating paste (PIP, Mizzy) was used to identify and relieve pressure spots. Metal housings with block-out spacers were picked up intraorally with auto polymerizing acrylic resin (Figure 6). Prostheses were remounted to refine occlusion and establish bilateral balanced articulation [12]. The final result achieved satisfactory esthetics, function, and comfort (Figures 7-9).

Figure 1: Preoperative smile view.

Figure 2: Existing maxillary complete denture showing the warse and multiple repairs.

Figure 3: Existing mandibular complete denture. Occlusal view.

Figure 4: Existing mandibular complete denture. View of the intaglio.

Figure 6: Mandibular arch showing the metal housing on new abutments.

Figure 7: Mandibular complete implant-supported overdenture, intaglio.

Figure 8: Mandibular complete implant-supported overdenture, ovvlusal view.

Figure 9: Postoperative smile view.

Figure 10: Postoperative maximum intercuspal position.

Discussion

Long-term service of removable prostheses frequently results in complications such as attachment wear, prosthetic tooth attrition, and loss of retention, which may compromise patient comfort and implant longevity [4-6]. In the present case, more than two decades of continuous use led to severe occlusal wear and esthetic dissatisfaction, necessitating complete prosthetic replacement. Restoration of vertical dimension was a key consideration, as excessive wear had altered occlusal relationships. Because patients with worn prostheses may exhibit distorted neuromuscular patterns, a combination of clinical methods-such as evaluation of vertical dimension at rest, phonetics, and esthetics-was used to accurately reestablish the occlusion [7-9]. Reinforcement of the mandibular overdenture with a metal framework was selected to counteract stress concentration around the attachment sites, which can lead to fracture and repair over time [10,11]. Additionally, bilateral balanced occlusion was refined during insertion to improve prosthesis stability and patient function [12,13]. This systematic approach ensured functional, esthetic, and durable outcomes, restoring patient satisfaction while maintaining implant health.

Conclusion

The rehabilitation of a patient with a maxillary complete denture and a mandibular implant-supported overdenture exhibiting severe wear requires careful evaluation of vertical dimension, prosthetic reinforcement, and occlusal refinement. A systematic approach, as demonstrated in this case, can restore function, esthetics, and patient satisfaction while enhancing prosthesis longevity.

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