



ASSESSMENT OF MASTICATORY EFFICIENCY IN PATIENTS USING IMPLANT-SUPPORTED PROSTHESES

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Abstract: *Implant-supported prostheses have become a standard solution for restoring masticatory function in partially or completely edentulous patients. Masticatory efficiency, defined as the ability to chew and process food effectively, is a critical outcome measure reflecting functional success of implant therapy. This study aimed to assess masticatory efficiency in patients using implant-supported prostheses and compare it with conventional removable dentures. A cross-sectional study of 80 patients was conducted using objective masticatory tests and patient-reported outcomes. Results demonstrated that implant-supported prostheses significantly improved chewing performance, bite force, and patient satisfaction compared to conventional dentures. These findings highlight the functional advantages of implant-supported rehabilitation and its positive impact on oral health-related quality of life.*

Keywords: *implant-supported prostheses, masticatory efficiency, dental implants, oral function, patient satisfaction*

Introduction

The restoration of masticatory function is a primary goal of prosthodontic treatment, especially in patients with partial or complete edentulism. Conventional removable dentures often provide limited stability and retention, leading to decreased chewing efficiency and patient dissatisfaction. Implant-supported prostheses have emerged as a reliable alternative, offering improved stability, comfort, and functional performance. Masticatory efficiency is an essential parameter to evaluate the functional outcome of dental implants, as it directly affects nutritional intake, speech, and overall quality of life. Numerous studies suggest that patients with implant-supported prostheses experience superior chewing ability, but quantitative assessments are required to objectively measure these improvements. Understanding these outcomes is



crucial for optimizing treatment planning and patient education in prosthodontic practice.

Objective

The primary objective of this study was to assess masticatory efficiency in patients using implant-supported prostheses and compare their performance with patients using conventional removable dentures. Secondary objectives included evaluating the relationship between implant number, prosthesis type, and functional outcomes, as well as measuring patient satisfaction and quality of life related to oral function.

Materials and Methods

Eighty patients, aged 35–70 years, who had received implant-supported prostheses for at least six months, were enrolled in this study. Inclusion criteria included partially or completely edentulous patients rehabilitated with fixed or removable implant-supported prostheses. Exclusion criteria comprised systemic conditions affecting mastication, temporomandibular disorders, or cognitive impairments. Masticatory efficiency was evaluated using a standardized color-changeable chewing gum test and a two-color wax mixing method to quantify bolus comminution. Bite force measurements were obtained using a digital occlusal force meter. Patient satisfaction was assessed using a structured questionnaire covering comfort, chewing ability, speech, and esthetics. Statistical analysis included descriptive statistics and comparisons between implant-supported and conventional denture groups using independent t-tests and correlation analysis (SPSS software, version 26).

Results

Results demonstrated a significant increase in masticatory efficiency among patients using implant-supported prostheses compared to those with conventional removable dentures ($p < 0.01$). The mean bite force in the implant group was 520 ± 80 N, significantly higher than the 290 ± 70 N recorded in the conventional denture group. Chewing tests indicated improved bolus comminution and faster chewing cycles in the implant-supported group. Patient-reported outcomes revealed higher satisfaction with mastication, comfort, and stability, while minimal issues were reported with speech or esthetics. Correlation analysis showed that the number of implants positively influenced masticatory efficiency and patient satisfaction.

Discussion

The study confirms that implant-supported prostheses provide superior masticatory performance and improved oral function compared to conventional dentures. Enhanced stability and retention of implant-supported restorations allow



patients to generate greater bite forces and achieve more efficient bolus formation. This functional advantage is reflected in higher patient satisfaction and quality of life. The findings are consistent with previous research demonstrating that implant-supported rehabilitation restores chewing ability to near-physiological levels. Clinicians should consider patient-specific factors, such as bone quality, implant number, and occlusal scheme, to optimize functional outcomes. Additionally, patient education on adaptation and maintenance is crucial for long-term success. Limitations of this study include the cross-sectional design and a relatively small sample size, which may restrict generalizability. Future longitudinal studies should evaluate long-term masticatory function and nutritional impact in patients with implant-supported prostheses.

Conclusion

Implant-supported prostheses significantly enhance masticatory efficiency, bite force, and overall patient satisfaction compared to conventional removable dentures. The functional improvements observed contribute to better nutritional intake, oral comfort, and quality of life. Careful treatment planning, appropriate implant selection, and patient-centered follow-up are essential to maximize the benefits of implant-supported rehabilitation. These findings reinforce the clinical advantages of implant therapy in prosthodontics and highlight the importance of objective functional assessments in evaluating treatment outcomes.

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