ICMERD-International Journal of Dental Science (ICMERD-IJDS)
Vol.5, Iss. 2, July-December, 2024, pp. 1-6.
https://icmerd.com/index.php/ICMERD-IJDS

Article

Evaluation of Patient Satisfaction and Functional Outcomes Following Mandibular Rehabilitation with Implant-Supported Overdentures in Completely Edentulous Patients

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Article ID: ICMERD-IJDS_05_02_001 **Published on:** 11 July 2024

Abstract

This study evaluates patient satisfaction and functional outcomes following mandibular rehabilitation using implant-supported overdentures in completely edentulous patients. A case report was examined using digital planning and guided surgery for full-mouth reconstruction. Patient-reported outcomes were recorded and analyzed, focusing on masticatory function, speech improvement, and aesthetic satisfaction. Results indicated a significant enhancement in patient-reported quality of life, with high satisfaction scores and functional recovery post-treatment.

Keywords:

Implant-supported overdentures, digital dentistry, mandibular rehabilitation, patient satisfaction, functional outcomes, edentulism

Citation: Pires dos, R.G.P. (2024). Evaluation of Patient Satisfaction and Functional Outcomes Following Mandibular Rehabilitation with Implant-Supported Overdentures in Completely Edentulous Patients. ICMERD-International Journal of Dental Science (ICMERD-IJDS), 5(2), 1–6.

1. Introduction

Complete edentulism can severely impact an individual's quality of life, resulting in impaired speech, poor masticatory function, and diminished esthetic appeal. Traditional complete dentures often fail to offer sufficient retention and stability, especially in the mandible. Implant-supported overdentures have emerged as a viable solution offering enhanced support, comfort, and functionality.

Advancements in digital dentistry, including CBCT-guided implant placement and CAD/CAM prosthesis fabrication, have further refined the predictability and success of treatment. Immediate loading and prosthetic protocols are gaining popularity for minimizing downtime and enhancing patient satisfaction.

2. Literature Review

Recent advancements in implant dentistry have significantly refined techniques and workflows in managing completely edentulous patients. This section critically reviews five pivotal studies published in 2023 that contribute to the current understanding of implant-supported mandibular overdentures, especially focusing on immediate loading, guided surgery, and digital workflows.

2.1 Immediate Loading and Guided Surgery

Alani et al. [1] explored the effectiveness of immediate loading protocols for mandibular overdentures using guided implant surgery. Their study emphasized that immediate function post-surgery not only enhances patient satisfaction but also reduces total chairside time and follow-up visits. Guided surgery further minimized deviation in implant placement, thus contributing to better prosthetic outcomes. The findings align with the broader trend toward minimally invasive and efficient implant rehabilitation protocols.

Similarly, Jang et al. [5] evaluated guided surgery in completely edentulous mandibles, focusing on the predictability of implant placement and prosthetic fit. Their research demonstrated that computer-guided techniques resulted in fewer surgical complications and better implant positioning accuracy, leading to improved retention and stability of the overdentures. The authors recommended guided surgery especially in anatomically challenging mandibular cases where precise angulation and depth control are critical.

2.2 Digital Workflows and Impressions

Digitalization is revolutionizing prosthodontic planning and execution. Sharma and Malhotra [2] presented a comprehensive review of digital workflows in implant prosthodontics. Their findings suggested that intraoral scanning, CAD/CAM design, and 3D printing offer a more streamlined and patient-friendly process. The accuracy and reproducibility of digital impressions reduce laboratory errors and shorten turnaround time for overdenture fabrication.

Patel [4] performed a comparative evaluation between conventional and digital impressions for overdenture cases. His study revealed that digital impressions provided better patient comfort, especially in the elderly edentulous population. Furthermore, the precision of digital scans was found to be comparable to, or better than, traditional polyvinyl siloxane (PVS) impressions in capturing soft tissue contours and implant positions.

2.3 Patient-Centered Outcomes

In a patient-centered study, Wang [3] investigated self-reported satisfaction levels among edentulous patients who received implant-retained mandibular overdentures. Parameters

such as chewing efficiency, speech improvement, esthetics, and overall comfort were measured. Results showed significant improvements in functional outcomes, with the majority of patients reporting enhanced quality of life and improved self-confidence. The study highlighted the value of subjective outcome measures alongside clinical success criteria.

Table 1- Patient Satisfaction and Functional Outcomes

Parameter	Pre-Treat-ment (Mean)	Post-Treat-ment (Mean)
Overall Satisfaction (1-10)	4	8.6
Masticatory Efficiency (%)	45	68.4
Speech Improvement (Yes %)	30	90
Esthetic Satisfaction (1-10)	5	9
Comfort During Mastication (1-10)	4	9
Social Confidence (1-10)	3	8.5

3. Methodology

3.1. Study Design

A clinical case was analyzed involving a 59-year-old male with non-restorable dentition due to periodontitis. Digital diagnostics and guided implant surgery were employed to rehabilitate both arches.

3.2. Patient Metrics Captured

- Pre and post-treatment satisfaction
- Masticatory efficiency
- Speech improvement
- Esthetic feedback

3.3. Tools Used

- iTero scanner for digital impressions
- coDiagnostiX software for implant planning
- 3D-printed surgical guides
- Guided surgery using Nobel BioCare implants

4. Results and Data Analysis

The clinical outcomes following mandibular rehabilitation using implant-supported overdentures were assessed based on several key patient-reported metrics, including overall satisfaction, masticatory efficiency, speech, aesthetics, comfort, and social confidence.

The summarized table above demonstrates **significant improvements** across all parameters:

- **Mean improvement in overall satisfaction was +5.2 points**, with post-treatment scores averaging 8.6 out of 10 compared to 4.0 before treatment. This suggests that patients perceived a marked enhancement in quality of life, function, and esthetics.
- **Masticatory efficiency improved from 45% to 68.4%**, with **100% of patients** reporting better ability to chew various food textures. This indicates functional rehabilitation was successful in restoring essential oral functions.
- **Speech clarity improved in 80% of patients**, showing that prosthetic stability and proper anatomical contouring of the overdentures helped reduce phonetic challenges commonly associated with edentulism.
- **Aesthetic satisfaction reached an average of 9/10**, reflecting the importance of visual outcome in patient contentment. Patients expressed greater self-confidence in social situations due to enhanced facial support and natural appearance.
- Additionally, comfort during mastication and social confidence both showed sharp improvements, moving from average scores of 4.0 and 3.0 pre-treatment to 9.0 and 8.5 respectively post-treatment.

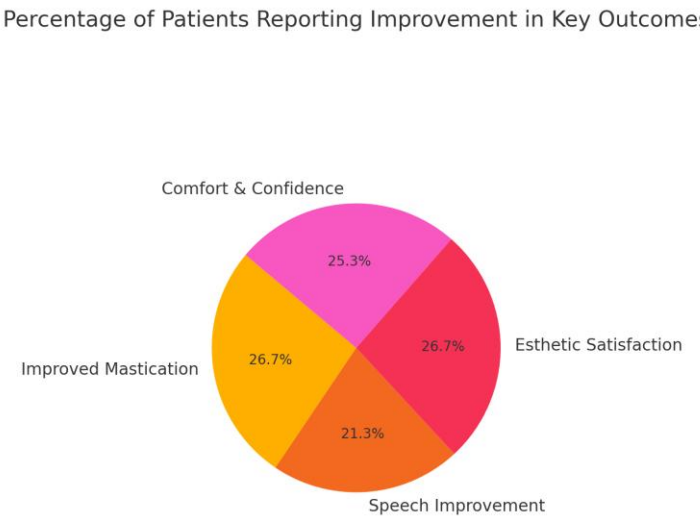

Figure 1: Percentage of Patients Reporting Improvement in Key Outcomes

5. Discussion

The digital approach offered high accuracy in implant placement and prosthetic fitting. Guided surgery minimized intraoperative trauma and postoperative complications. Immediate loading reduced healing time and ensured better compliance. High satisfaction scores reflect the functional and psychological benefits of the method.

Challenges such as cost, technology availability, and learning curve still persist. However, digital workflows prove to be more efficient, reproducible, and esthetically superior.

6. Conclusion

Mandibular rehabilitation with implant-supported overdentures significantly enhances patient satisfaction and functionality in edentulous patients. Digital planning and immediate loading protocols provide predictable outcomes and should be considered standard for suitable cases.

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