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Clinical Evaluation and Success Rate of Dental Implants in Posterior Edentulous Patients: A Retrospective Study

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Research Article

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Abstract

Objective: The study aims to evaluate the clinical outcomes and success rate of endosseous dental implants placed in posterior edentulous sites over a period of three years.

Methods: A retrospective analysis was conducted on 120 patients who received 180 titanium dental implants in posterior mandibular and maxillary regions. Clinical parameters such as implant stability, peri-implant bone loss, soft tissue health, and prosthetic success were assessed during follow-up visits at 6, 12, 24, and 36 months.

Results: The cumulative success rate of dental implants was 94.4% at the end of three years. The most common cause of failure was peri-implantitis, particularly in patients with a history of periodontitis and poor oral hygiene. No statistically significant difference was found between maxillary and mandibular implant success rates.

Conclusion: Dental implants in posterior edentulous regions show high success rates and are a predictable option for oral rehabilitation, provided appropriate case selection and maintenance protocols are followed.

Keywords:

Dental implants, posterior edentulism, implant success rate, peri-implantitis, oral rehabilitation, titanium implants, implant stability

INTRODUCTION

Dental implants have emerged as a standard treatment modality for the replacement of missing teeth, offering improved function, esthetics, and patient satisfaction. The introduction of osseointegrated titanium implants by Brånemark in the 1960s revolutionized prosthetic dentistry.

Implant therapy in posterior edentulous regions presents unique challenges due to bone quality variability, occlusal load, and accessibility. Despite these challenges, success rates for dental implants in posterior sites have improved due to advancements in surgical protocols, surface treatments, and prosthetic designs.

This study aims to assess the long-term clinical outcomes and factors influencing the success or failure of dental implants placed in posterior regions over a 36-month period.

MATERIALS AND METHODS

Study Design

A retrospective study was conducted based on

clinical records from January 2019 to December 2022 at two private dental centers.

Inclusion Criteria

- Patients aged 20–70 years
- Implants placed in the posterior maxilla or mandible
- Follow-up data available for a minimum of 36 months

Exclusion Criteria

- Systemic conditions affecting bone metabolism
- History of radiation therapy in the head and neck region
- Non-compliance with follow-up

Surgical Procedure

Standard two-stage surgical protocol was followed. Implants used were screw-type titanium with roughened surfaces. Healing abutments were placed after 3–4 months of osseointegration.

Clinical Assessment Parameters

- Primary and secondary implant stability (manual torque and percussion test)

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- Marginal bone loss (measured via radiographs)
- Presence of peri-implant mucositis or peri-implantitis
- Prosthetic complications (screw loosening, fracture, prosthesis failure)

Statistical

Descriptive statistics and Kaplan-Meier survival analysis were used to evaluate implant survival. Chi-square test was used to compare categorical variables.

Analysis

RESULTS

Out of 180 implants placed in 120 patients (68 males, 52 females), 170 implants remained functional and asymptomatic at the end of 36 months, indicating a cumulative success rate of 94.4%.

- **Implant Failure (n=10):**
 - Peri-implantitis: 6 cases
 - Early failure due to lack of osseointegration: 3 cases
 - Prosthetic overload: 1 case
- **Mean Marginal Bone Loss:**
 - 0.9 mm at 12 months
 - 1.3 mm at 36 months
- No significant difference in implant survival between the maxillary (93.8%) and mandibular (95.1%) groups.

Discussion

The high success rate observed aligns with existing literature on implant performance in posterior regions. Although posterior implants are exposed to higher masticatory loads, modern implant designs and careful surgical protocols have minimized the risk of failure.

Peri-implantitis remains the primary cause of late implant failure, often linked to poor plaque control and smoking. The slightly higher failure rate in maxillary implants, although not statistically significant, may be due to lower bone density.

Prosthetic complications were minimal and manageable,

reinforcing the importance of occlusal harmony and patient education on oral hygiene practices.

CONCLUSION

Dental implants in posterior edentulous regions offer a reliable and durable solution for tooth replacement, with success rates exceeding 94% over three years. Long-term implant survival is contingent upon rigorous case selection, meticulous surgical technique, and effective post-operative care.

Future studies should explore prospective multicenter trials and evaluate implant performance in medically compromised populations.

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