

COMPARATIVE EVALUATION OF SUCCESS RATES OF SURGICALLY PLACED DENTAL IMPLANTS AND FIXED PARTIAL DENTURES FOR THE REPLACEMENT OF MISSING TEETH

Dr. Vineet Mohan Mishra¹, Dr. Roshan P. Dhonge², Dr. Sheetal Grover³, Dr. Sangam Mittal⁴, Dr. Bhupendra Lokhande⁵, Dr. Chaitanya Metkar⁶

¹M.D.S. Prosthodontics, Sr. Lecturer, Dental College Azamgarh. Email: vineetmohan@gmail.com (Corresponding Author)

²Reader, Department of Periodontology, V.Y.W.S. Dental College & Hospital, Amravati.

³Professor, Department of Conservative Dentistry and Endodontics, MM College of Dental Sciences and Research, Mullana.

⁴Reader, Department of Conservative Dentistry and Endodontics, Guru Nanak Dev Dental College, Sunam.

⁵Reader, Department of Conservative Dentistry and Endodontics, VYWS Dental College and Hospital, Amravati.

⁶Reader, Department of Conservative Dentistry and Endodontics, VYWS Dental College and Hospital, Amravati.

***Corresponding author: Dr. Vineet Mohan Mishra, M.D.S. Prosthodontics, Sr. Lecturer, Dental College Azamgarh.**

Email: vineetmohan@gmail.com

Received: 10th June, 2026; **Revised:** 18th June, 2026; **Accepted:** 22nd June, 2026; **Available Online:** 25th June, 2026

ABSTRACT

Background

This research was carried out to compare the success rates of surgically inserted dental implants with those of Fixed Partial Dentures in the replacement of absent teeth.

Material and Methods

This research involved a total of 100 participants who presented to the department with the primary concern of missing teeth. A thorough intraoral examination was performed on all participants. Those with sufficient bone density were considered for dental implants, while individuals with healthy teeth adjacent to the edentulous regions were scheduled for fixed partial dentures (FPDs). The complications associated with both treatment options were observed, and the success rates were calculated. Statistical analysis was carried out using SPSS software.

Results

The participants were categorized into two groups according to the treatment administered. Subjects in Group 1 received dental implants, while those in Group 2 were provided with fixed partial dentures (FPDs). Each group consisted of 50 subjects. The study comprised of 60 males and 40 females. Group 1 had 20 males and 30 females and the second group had 40 males and 10 females. 7 subjects from the first group showed peri-implantitis whereas implant mobility was seen in 1 subject. Hence, the failure rate of dental implants was 16%. 5 out of 50 subjects in the second group showed loss of retention followed by caries in 1 patient. Total 6 complications were observed. Hence the failure rate was 12%. FPDs were proven to be more successful (88%) as compared to Dental Implants (84%) for the replacement of missing teeth.

Conclusion

FPDs were proven to be more successful (88%) as compared to Dental Implants (84%) for the replacement of missing teeth.

Keywords: Implants, FPDs, Edentulism.

How to cite this article: Mishra VM, Dhonge RP, Grover S, Mittal S, Lokhande B, Metkar C. Comparative Evaluation of Success Rates of Surgically Placed Dental Implants and Fixed Partial Dentures for the Replacement of Missing Teeth. Int J Drug Deliv Technol. 2026;16(64s):15-18. DOI: 10.25258/ijddt.16.64s.2

Introduction

A person's dental health is essential for maintaining their identity. The condition of an individual's teeth significantly influences their overall well-being.¹ The relationship between dental health and overall

health is profound, with socioeconomic factors playing a pivotal role in the maintenance of teeth. Psychological distress, social isolation, and physical harm resulting from tooth loss adversely affect an individual's quality of life.² Research indicates a negative correlation between social connections,

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self-esteem, and the presence of missing or inadequately restored teeth.³ Therefore, tooth restoration is vital for enhancing oral health, appearance, and self-esteem.

Historically, clinicians employed various outdated implant designs that healed through fibro-osseous integration. The advent of modern dental implantology was marked by the introduction of screw-type, root-form implants that heal via osseointegration, allowing for direct contact between vital bone and titanium surfaces.⁴ These implants have provided significant advantages for patients who are fully or partially edentulous.

Currently, fixed partial dentures are less favored, as their application necessitates the preparation of adjacent teeth and the loss of healthy tooth structure. While they have been historically successful, the survival rates of fixed partial dentures are lower than those of single-unit implants, especially in cases where the abutment teeth have undergone endodontic treatment.^{5,6}

Consequently, this study was undertaken to compare the success rates of surgically placed dental implants with those of fixed partial dentures in the replacement of missing teeth.

Material and methods

This research involved a total of 100 participants who presented to the department with the primary concern of missing teeth. A thorough intraoral examination was performed on all participants. Those with sufficient bone density were considered for dental implants, while individuals with healthy teeth adjacent to the edentulous regions were scheduled for fixed partial dentures (FPDs). The complications associated with both treatment options were observed, and the success rates were calculated. Statistical analysis was carried out using SPSS software.

Results

The participants were categorized into two groups according to the treatment administered. Subjects in Group 1 received dental implants, while those in Group 2 were provided with fixed partial dentures (FPDs). Each group consisted of 50 subjects.

Table 1: Gender-wise distribution of subjects.

Gender	Males	Females	Total
Group 1	20	30	50
Group 2	40	10	50
Total	60	40	100

The study comprised of 60 males and 40 females. Group 1 had 20 males and 30 females and the second group had 40 males and 10 females.

Table 2: Complications of dental implants in group 1 subjects.

Complications	Number of subjects
Peri-implantitis	07
Implant mobility	01
Nerve damage	00
Infection	00
Total	08

7 subjects from the first group showed peri-implantitis whereas implant mobility was seen in 1 subject. Hence, the failure rate of dental implants was 16%.

Table 3: Complications of FPDs in group 2 subjects.

Complications	Number of subjects
Loss of retention	05
Tooth fracture	00
Occlusal problems	00
Caries	01
Porcelain fracture	00

5 out of 50 subjects in the second group showed loss of retention followed by caries in 1 patient. Total 6 complications were observed. Hence the failure rate was 12%.

Table 4: Comparison of success rates of the 2 treatment modalities.

Fate of treatment	Group 1	Group 2
Success	42/50 (84%)	44/50 (88%)
Failure	08/50 (16%)	06/50 (12%)
Total	100%	100%

FPDs were proven to be more successful (88%) as compared to Dental Implants (84%) for the replacement of missing teeth.

Discussion

Currently, dental implants represent a prominent restorative option for the replacement of absent teeth. Advances in implant design, surface properties, and surgical techniques have rendered implants a reliable and highly predictable intervention, boasting a mean survival rate of 94.6% and a mean success rate of 89.7% after a duration exceeding 10 years.⁷

The efficacy of any fixed prosthesis is assessed through the evaluation of outcomes related to chewing function, aesthetics, durability, and technical complications. In a study conducted by Anderson in 1998, it was emphasized that when evaluating the effectiveness of fixed prosthesis therapy, it is crucial to take into account both the assessments of clinicians and the perceptions of patients.⁸ Nevertheless, significant factors such as patient satisfaction remain inadequately addressed in the existing literature, particularly concerning

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implant prostheses.⁹ Consequently, this research was undertaken to conduct a comparative analysis of the success rates of surgically placed dental implants versus Fixed Partial Dentures in the context of replacing missing teeth.

The participants were categorized into two groups according to the treatment administered. Subjects in Group 1 received dental implants, while those in Group 2 were provided with fixed partial dentures (FPDs). Each group consisted of 50 subjects. The study comprised of 60 males and 40 females. Group 1 had 20 males and 30 females and the second group had 40 males and 10 females. 7 subjects from the first group showed peri-implantitis whereas implant mobility was seen in 1 subject. Hence, the failure rate of dental implants was 16%. 5 out of 50 subjects in the second group showed loss of retention followed by caries in 1 patient. Total 6 complications were observed. Hence the failure rate was 12%. FPDs were proven to be more successful (88%) as compared to Dental Implants (84%) for the replacement of missing teeth.

Suganna M et al¹⁰ conducted a study assess the awareness of patients about various dental prosthetic rehabilitative procedures in Saudi Arabia, their preference(s) regarding the choice of treatment, and the motivating factors that drive them to avail of dental prosthetic rehabilitative treatment. After randomly selecting 600 individuals for the purpose of our investigation, a nine-variable questionnaire was framed by investigators to record the responses of those who consented to participate in their study. Only 68.3% of the respondents were found to be aware of the several prosthodontic replacement choices. As mentioned by the majority of the respondents, the cost element was the biggest drawback for replacement. The benefits of choosing fixed partial dentures (FPD) or dental implants were judged to be aesthetics (41.1%) and the feel of one's own teeth (40.1%). Only 68.3% of respondents reported knowing about the several prosthodontic replacement choices. The cost aspect was cited by 348 respondents as the biggest drawback to replacement. The perceived benefits of choosing FPD or dental implants were deemed to be aesthetics (41.1%) and the feel of one's own teeth (40.1%).

Da Silva JD et al¹¹ determined the types, outcomes, risk factors and esthetic assessment of implants and their restorations placed in the general practices of a practice-based research network. All patients who visited network practices three to five years previously and underwent placement of an implant and restoration within the practice were invited to enroll. Practitioner-investigators (P-Is) recorded the status of the implant and restoration, characteristics of the implant site and restoration, presence of peri-implant pathology and an esthetic assessment by the P-I and patient. The P-Is classified implants as

failures if the original implant was missing or had been replaced, the implant was mobile or elicited pain on percussion, there was overt clinical or radiographic evidence of pathology or excessive bone loss (> 0.2 millimeter per year after an initial bone loss of 2 mm). They classified restorations as failures if they had been replaced or if there was abutment or restoration fracture. The authors enrolled 922 implants and patients from 87 practices, with a mean (standard deviation) follow-up of 4.2 (0.6) years. Of the 920 implants for which complete data records were available, 64 (7.0 percent) were classified as failures when excessive bone loss was excluded from the analysis. When excessive bone loss was included, 172 implants (18.7 percent) were classified as failures. According to the results of univariate analysis, a history of severe periodontitis, sites with preexisting inflammation or type IV bone, cases of immediate implant placement and placement in the incisor or canine region were associated with implant failure. According to the results of multivariate analysis, sites with preexisting inflammation (odds ratio [OR] = 2.17; 95 percent confidence interval [CI], 1.41–3.34) or type IV bone (OR = 1.99; 95 percent CI, 1.12–3.55) were associated with a greater risk of implant failure. Of the 908 surviving implants, 20 (2.2 percent) had restorations replaced or judged as needing to be replaced. The majority of P-Is and patients were satisfied with the esthetic outcomes for both the implant and restoration. These results suggested that implant survival and success rates in general dental practices may be lower than those reported in studies conducted in academic or specialty settings.

Conclusion

FPDs were proven to be more successful (88%) as compared to Dental Implants (84%) for the replacement of missing teeth.

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