

Comparative Study of Remaining Teeth of Patients with Implant Supported and Non-Supported Fixed Partial Denture

Manoj Kumar Thakur^{1*} Mansi Rajput²

¹Senior Resident, Department of Dentistry, Nalanda Medical College & Hospital, Patna, Bihar, India.

²Senior Resident, Department of Dentistry, Jawahar Lal Nehru Medical College & Hospital, Bhagalpur, Bihar, India.

ABSTRACT

Background: There is an open question whether or not the practice of evidence-based treatment planning is possible in prosthetic dentistry.

Materials & methods: A total of 20 patients were enrolled in the present study. Among these 20 patients, 10 patients received implant supported fixed partial denture while the remaining 10 patients received tooth supported fixed partial denture. Complete demographic details of all the patients were obtained. Only those patients were included in which 2 to 3 permanent mandibular teeth were missing with presence of natural teeth on both the proximal sides of the edentulous space. Follow-up examination of the remaining teeth status was done both clinically and radiographically.

Results: Radiographic evidence of bone loss on follow-up was present in 1 patient of implant supported fixed partial denture group and in 2 patients of tooth supported fixed partial denture group. On clinical examination, it was observed periodontal pockets were found to be present in 2 patient with implant supported fixed partial denture, while it was present in 3 patients of tooth supported fixed partial denture. Remaining teeth status was comparable among both the groups.

Conclusion: Both implant supported fixed partial denture and tooth supported fixed partial denture have equal prognosis.

Keywords: Fixed partial denture, Implant, Supported.

INTRODUCTION

There is an open question whether or not the practice of evidence-based treatment planning is possible in prosthetic dentistry. Ideally, treatment decisions should be based on well-performed systematic reviews of the available evidence and, if possible, on formal quantitative evidence synthesis and meta-analysis. The studies in the dental literature reporting on tooth-supported and implant supported fixed dental prosthesis (FDPs) are mostly observational studies and single-center case cohorts. The systematic reviews conducted so far indicate that the observed survival of FDPs after 10 years ranged between 85% and 95%. Hence, the

present study was undertaken for assessing and comparing the remaining teeth status of patients with implant supported and non-supported fixed partial dentures.

MATERIALS & METHODS

The present study was conducted in the department of prosthodontics of the dental institute and it included assessment of remaining teeth status of patients with implant supported and non-supported fixed partial dentures. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients

Received: June. 12, 2019; Accepted: July. 17, 2019

*Correspondence Dr. Manoj Kumar Thakur.

Department of Dentistry, Nalanda Medical College & Hospital, Patna, Bihar, India.

Email: Not Disclosed

after explaining in detail the entire research protocol. A total of 20 patients were enrolled in the present study. Among these 20 patients, 10 patients received implant supported fixed partial denture while the remaining 10 patients received tooth supported fixed partial denture. Complete demographic details of all the patients were obtained. Only those patients were included in which 2 to 3 permanent mandibular teeth were missing with presence of natural teeth on both the proximal sides of the edentulous space. Follow-up examination of the remaining teeth status was done both clinically and radiographically. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test was used for assessment of level of significance.

RESULTS

A total of 20 patients were enrolled. Mean age the patients with implant supported fixed partial denture and tooth supported fixed partial denture was 38.5 years and 42.9 years respectively. There were 7 males and 3 females in implant supported fixed partial denture group and 6 males and 4 females in tooth supported fixed partial denture group. Radiographic evidence of bone loss on follow-up was present in 1 patient of implant supported fixed partial denture group and in 2 patients of tooth supported fixed partial denture group. On clinical examination, it was observed periodontal pockets were found to be present in 2 patient with implant supported fixed partial denture, while it was present in 3 patients of tooth supported fixed partial denture. Remaining teeth status was comparable among both the groups.

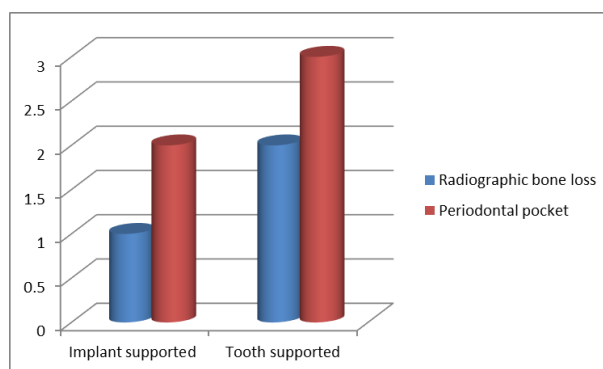
Table 1: Demographic data

Parameter		Implant supported	Tooth supported
Age group (years)	Less than 30	3	2
	30 to 50	5	5
	More than 50	2	3
Gender	Males	7	6
	Females	3	4

Table 2: Prognosis

Follow-up	Implant supported	Tooth supported
Radiographic bone loss	1	2
Periodontal pocket	2	3

Graph 1: Prognosis



DISCUSSION

Various modalities of treatment are available to replace missing teeth depending on the number and condition of remaining teeth, space available, adequacy of bone support, cost, and patient desires. Implant supported fixed dental prosthesis has been proven as an efficient modality of treatment. Implant is connected to remaining natural teeth sometimes when there is an anatomic limitation of space for implants or failure of an implant to osseointegrate.⁵⁻⁷

With the exception of a shortened dental arch, every tooth gap requires the earliest possible prosthetic restoration in order to avoid secondary damage. When deciding upon the type of denture most suitable for the respective patient, besides the nature of the opposing dentition or the type of prosthetic restoration in the opposing arch, the following factors play a crucial role: (1) size of gap (number of missing teeth), type of gap (free-end or interdental), and gap localization; (2) age of patient; (3) specific factors in the patient's lifestyle, including in particular the quality of the patient's oral hygiene as well as his or her tobacco consumption.⁸⁻¹⁰

A total of 20 patients were enrolled. Mean age the patients with implant supported fixed partial denture and tooth supported fixed partial denture

was 38.5 years and 42.9 years respectively. There were 7 males and 3 females in implant supported fixed partial denture group and 6 males and 4 females in tooth supported fixed partial denture group. Yamazaki S et al compared the various complication-free rates and survival rates of remaining teeth among implant-supported fixed dentures (IFDs), removable partial dentures (RPDs) and no-restoration (NR) patients with unilateral free-end edentulism. Thirty-three patients were included in the IFD group, 41 matched patients in the RPD group, and 10 patients who received RPDs but refused their use were regarded as NR group. The remaining dentition was classified into five subcategories in relation to the missing portion: adjacent teeth to the missing portion (AD), contralateral posterior dentition in the same jaw (CS) and in the opposite jaw (CO), ipsilateral opposing posterior dentition (IO), and anterior dentition (AN). Complications were defined as tooth extraction, periodontal lesions, periapical lesions or loss of retention of the prosthesis and were assessed by one examiner based on the hospital chart records. The cumulative complication-free rates in the remaining teeth were significantly different among each of the three groups ($p < 0.01$), with a significantly lower incidence rate in the IFD group. Regarding the cumulative survival rate of the remaining teeth, there was a significant difference only between IFD and NR group ($p = 0.01$), especially in the CO region ($p = 0.04$). Stable posterior occlusal support obtained with IFD treatment for unilateral free-end edentulism may reduce the incidence of complications in the remaining teeth, by decreasing the adverse mechanical stress.¹⁰

Biological complications include gradual bone resorption around the implant neck, bone fracture, loss of osseointegration, peri-implantitis, endodontic problems, caries after cement dissolution and root fracture. Marginal bone loss is estimated to be threefold with rigid connection compared with free standing implant restorations and non-rigid tooth to implant prosthesis. However, it was within acceptable standards. Excessive loads to the implant may not have been transferred when they were connected to teeth.⁸⁻¹⁰

In the present study, Radiographic evidence of bone loss on follow-up was present in 1 patient of implant supported fixed partial denture group and in 2 patients of tooth supported fixed partial

denture group. On clinical examination, it was observed periodontal pockets were found to be present in 2 patient with implant supported fixed partial denture, while it was present in 3 patients of tooth supported fixed partial denture. Remaining teeth status was comparable among both the groups. Cordaro L et al reported on the implant success rate, prosthetic complications, and the occurrence of tooth intrusion, when complete-arch fixed prostheses, supported by a combination of implants and teeth, were fabricated for patients with normal and reduced periodontal support. Nineteen patients with residual teeth that served as abutments were consecutively treated with combined tooth- and implant-supported complete-arch fixed prostheses and were retrospectively evaluated after a period varying from 24 to 94 months. Nine patients showed reduced periodontal support as a result of periodontal disease and treatment (RPS group), and 10 patients had normal periodontal support of the abutment teeth (more than 2/3 of periodontal support [NPS group]). Ninety implants and 72 tooth abutments were used to support 19 fixed partial dentures. Screw- and cement-retained metal-ceramic and metal-resin prostheses were fabricated with rigid and nonrigid connectors. Implant survival and success rates, occurrence of caries and tooth intrusion, and prosthetic complications were recorded. One of the 90 implants was lost (99% survival rate) over 24 to 94 months, while 3 implants showed more than 2 mm of crestal bone loss (96% success rate) over the same period. Complete-arch fixed prosthesis supported by implant and tooth abutments may be associated with intrusion of teeth with intact periodontal support when nonrigid connectors are used to join the implant- and tooth-supported sections of the prostheses.¹¹

CONCLUSION

From the above results, the authors conclude that both implant supported fixed partial denture and tooth supported fixed partial denture have equal prognosis.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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