

Assessment of Reasons of Failure of Dental Implants

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ABSTRACT

Background: An implant-supported restoration offers a predictable treatment for tooth replacement. Failure of endosseous dental implants may occur prior to occlusal loading with a prosthetic superstructure or later after loading. Hence; the present study was undertaken for assessing the reasons for failure of dental implants.

Materials & methods: A total of 540 patients who underwent prosthetic rehabilitation for missing maxillary first molar were enrolled in the present study. Complete demographic details of all the patents were obtained. Follow-up details of all the patients were separately recorded. Separate charts were made for analysing the reasons for failure of dental implants. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: 66.67 percent of the patients were females while the remaining were males. Peri-implantitis, Screw fracture, adverse soft tissue reaction and Fracture of veneering porcelain were the main reasons for dental implant failure found to be present in 28.57%, 23.81%, 19.05%, 19.05% and 9.52% of the patients.

Conclusion: Peri-implantitis and screw fracture are the most common cause of dental implant failure.

Keywords: Implant, failure, dentistry.

INTRODUCTION

An implant-supported restoration offers a predictable treatment for tooth replacement. Reported success rates for dental implants are high, however, there is still a paucity of data in the literature regarding follow-up of implants in function for at least 5 years or more. Nevertheless, failures that mandate immediate implant removal do occur.¹⁻³ The consequences of implant removal jeopardize the clinician's efforts to accomplish satisfactory function and esthetics. For the patient, this usually involves further cost and additional procedures.^{4,5}

Failure of endosseous dental implants may occur prior to occlusal loading with a prosthetic superstructure or later after loading. Based on chronological criteria, the biological failures can be

classified into "early failures" (due to unsuccessful osseointegration, indicating impaired bone healing) and "late failures" (due to loss of osseointegration). Several factors may be associated with early implant failure such as smoking, implant characteristics, infection, and insufficient bone quality/quantity. Recognition of risk factors can reduce the failure rate and increase the predictability of dental implant treatment.^{6,7} Hence; the present study was undertaken for assessing the reasons for failure of dental implants.

MATERIALS & METHODS

The present study was conducted with the aim of assessing the reasons for dental implant failure. Ethical approval was obtained from institutional

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ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 540 patients who underwent prosthetic rehabilitation for missing maxillary first molar were enrolled in the present study. Complete demographic details of all the patients were obtained. Follow-up details of all the patients were separately recorded. Separate charts were made for analysing the reasons for failure of dental implants. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test was used for assessment of level of significance.

Table 1: Incidence of dental implant failure

Parameter	Number of patients	Percentage of patients
Dental implant failure	21	3.89

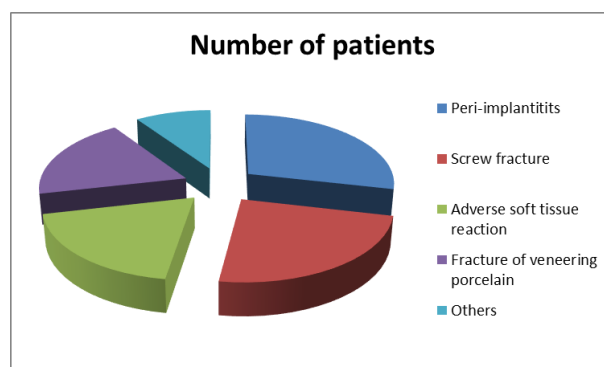
Table 2: Age-wise and gender-wise distribution of patients

Parameter		Number of patients	Percentage of patients
Age group (years)	Less than 30	5	23.81
	30 to 50	7	33.33
	More than 50	9	42.86
Gender	Males	7	33.33
	Females	14	66.67

Table 3: Reasons of dental implant failure

Reasons for failure of dental implants	Number of patients	Percentage of patients
Peri-implantitis	6	28.57
Screw fracture	5	23.81
Adverse soft tissue reaction	4	19.05
Fracture of veneering porcelain	4	19.05
Others	2	9.52

Graph 1: Reasons of dental implant failure



RESULTS

In the present study, out of 540 patients enrolled, dental implant failure was found to be present in 3.89 percent of the patients (21 patients). Among these 21 patients, 23.81 percent of the patients belonged to the age group of less than 30 years. 33.33 percent of the patients and 42.86 percent of the patients belonged to the age group of 30 to 50 years and more than 50 years. Out of 21 patients with dental implant failure, 66.67 percent of the patients were females while the remaining were males. Peri-implantitis, Screw fracture, adverse soft tissue reaction and Fracture of veneering porcelain were the main reasons for dental implant failure found to be present in 28.57%, 23.81%, 19.05%, 19.05% and 9.52% of the patients.

DISCUSSION

A dental implant is a surgical component that interfaces with the bone of the jaw or skull to support a dental prosthesis such as a crown, bridge, denture, facial prosthesis or to act as an orthodontic anchor. 90%–95% has been reported as the success rate of implants over the 10 years. Although it has become the treatment of choice for most of the dentists, still, the complications arising from dental implant placement are the biggest challenge.⁸

The contraindications of implant placement are patients with epilepsy, children and adolescents, patients having endocarditis, history of osteoradionecrosis, smokers, and diabetic patients. Absolute contraindications are patients with history of myocardial infarction, cerebrovascular accident, patients with history of bleeding, history of heart transplant, immune suppression, active treatment

of malignancy, drug abusers, and psychiatric illness.⁹

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In the present study, out of 540 patients enrolled, dental implant failure was found to be present in 3.89 percent of the patients (21 patients). Among these 21 patients, 23.81 percent of the patients belonged to the age group of less than 30 years. Han HJ et al analyzed the characteristics and causes of implant failures in hopes of reducing future failures. In total, 879 patients received 2,796 implants; 150 implants in 91 patients had failed. Early and late implant failures occurred with 86 (57.3%) and 64 (42.7%) implants, respectively. The main causes of early and late implant failures were inflammation (47%) and overloading (53%), respectively. When the cause of early implant failure was inflammation, the failure rate was significantly higher for implants in the anterior maxilla; implants with poor primary stability, a machined surface, or a length exceeding 15 mm; and implants placed with a reconstructive procedure and two-stage surgery. When late implant failure was caused by overloading, the failure rate was significantly higher for implants with a machined surface, placed with a reconstructive procedure and/or two-stage surgery, and supporting telescopic dentures. The major causes of implant failure are inflammation and overloading, and they differ between early and late implant failures.¹⁰

In the present study, peri-implantitis, Screw fracture, adverse soft tissue reaction and Fracture of veneering porcelain were the main reasons for dental implant failure found to be present in 28.57%, 23.81%, 19.05%, 19.05% and 9.52% of the patients. Krisam J et al evaluated early failure and possible risk factors for failure of dental implants placed under practice-based conditions. To clarify the research question, anonymized data from 106 patients with 186 dental implants were analyzed. The presence of successful healing (yes/no) at the time of incorporation of the final prosthesis was assessed. Mixed models were compiled for each target variable to enable estimation of the effects of patient-related and implant-related conditions on the risk of early implant failure. Nine out of 186 implants (4.8%) placed in 106 participants failed before incorporation of the final prosthesis. The use

of shorter implants (<10 mm) and the need for augmentation procedures were associated with a greater risk of early implant failure. For shorter implants, the risk was 5.8 times greater than that for longer implants ($p=0.0230$). Use of augmentation procedures increased the risk by a factor of 5.5 ($p=0.0174$). Implants placed in the dental practice with a specialization in implantology heal successfully.¹¹

CONCLUSION

From the above results, the authors concluded that peri-implantitis and screw fracture are the most common cause of dental implant failure.

CONFLICTS OF INTEREST

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

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