

## ORIGINAL RESEARCH

### Evaluation of causes of dental implant failure - A clinical study

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#### ABSTRACT:

**Background:** The present study was conducted to assess risk factors associated with dental implants. **Materials & Methods:** The present study was conducted on 760 patients having 1040 dental implants. The causes of implant failure were recorded. **Results:** Out of 760 patients, 410 were males having 560 dental implants and 350 were females having 480 dental implants. Males had 68 dental implant failures and females had 52 dental implants failures. The difference was non-significant ( $P > 0.05$ ). Out of 120 implant failures, 12 were seen in diabetic patients, 14 in smokers, 20 in periodontal diseases and 3 in bruxism. The difference was significant ( $P = 0.01$ ). Maximum implant failures were seen in 50 patients with type IV bone, 40 in type III, 20 in type II and 10 in patients with type I bone. The difference was non-significant ( $P > 0.05$ ). **Conclusion:** Dental implant failures were more common in type IV bone, in smokers and in patients with periodontitis.

**Key words:** Bone quality, Dental implant, Smoker

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#### INTRODUCTION

A dental implant is a surgical component that interfaces with the bone of the jaw or skull to support a dental prosthesis. The use of dental implants is now a widely accepted treatment modality for fully and partially edentulous patients. The success of this approach is rooted in the inherent ability of some dental materials, titanium in particular to osseointegrate, thereby creating direct bone-to-implant contact. Further improvements toward the successful osseointegration of dental implants have involved modifications to both surface topography and surface chemistry.<sup>1</sup>

Dental implants have been accepted as a viable treatment option for completely and partially edentulous patients. Further improvements toward the successful osseointegration of dental implants have involved modifications to both surface topography and surface chemistry. Implant design (*i.e.*, types and dimensions), surgical procedure, implant placement time and time prior to loading have been shown to influence implant survival rates.<sup>2</sup>

Further improvements toward the successful osseointegration of dental implants have involved modifications to both surface topography and surface

chemistry. Implant design (*i.e.*, type and dimensions), surgical procedure, timing of implant placement, and time prior to loading have also been shown to influence implant survival rates.<sup>2</sup> Among patient factors, male gender, smoking, autoimmune disease and penicillin allergy have been found to trend toward higher failure rates.<sup>3</sup>

A few studies have reported long-term results, showing more favourable survival statistics for solid screw over hollow cylinder implants, for mandibular sites over maxillary and lower survival statistics for patients presenting with a history of periodontitis. Long-term results of implants placed with guided bone regeneration and outcomes for the treatment of atrophic posterior maxilla have also been reported.<sup>4</sup> The present study was conducted to determine the risk factors for dental implants.

#### MATERIALS & METHODS

The present study was conducted in the department of Prosthodontics on 760 patients who received dental implants in last 5 years. Informed and written consent was obtained from all patients along with ethical clearance.

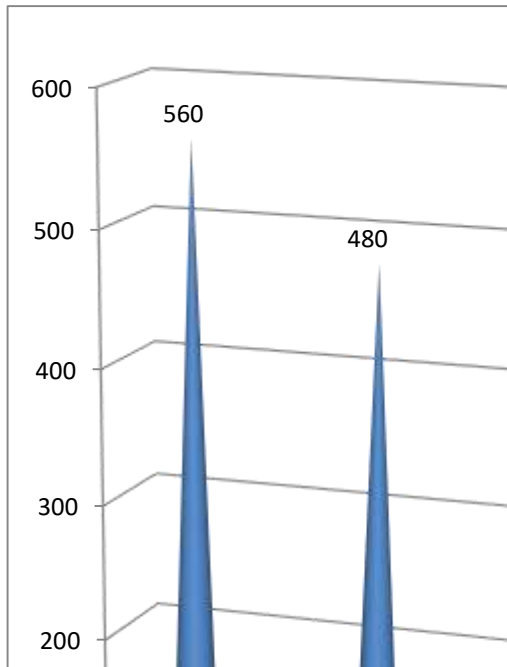
General information such as name, age, gender etc. was recorded. Data related to patients were recruited from departmental case history proforma. Signs of peri-implantitis and other related factors of implant failure were recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**Results**

**Table I: Distribution of implants**

Gender	Number(patients)	Number(implants)
Male	410	560
Female	350	480
Total	760	1040

**Graph I: Dental implant failures in both genders**



Graph I shows that males had 68 dental implant failures and females had 52 dental implants failures. The difference was non- significant (P> 0.05).

**Table II Systemic diseases and dental implant failure**

Systemic diseases	Failure	P value
Diabetes	12	0.01
Smoking	14	
Periodontitis	20	
Bruxism	3	

\*The difference was significant (P- 0.01).

**Table III Bone quality and failure**

Bone Type	Failure	P value
Type I	10	0.01
Type II	20	
Type III	40	
Type IV	50	

\*The difference was non- significant (P> 0.05).

**DISCUSSION**

The reasons for implants failure are lack of osseointegration during early healing, infection of the peri-implant tissues and breakage. The contraindications of implant placement are children & adolescents, epileptic patients, endocarditis, osteoradionecrosis, smoking and diabetes. Absolute contraindications consists of myocardial infarction and cerebrovascular accident, bleeding disorder, cardiac transplant, immunosuppression, active treatment of malignancy, drug abuse, psychiatric illness and intravenous bisphosphonate (BPs) use. However, apart from it failures in implants are also common.<sup>5</sup>

The present study was conducted to determine the risk factors for dental implants. In present study, out of 760 patients, males were 410 having 560 dental implants and females were 350 having 480 dental implants. David et al<sup>6</sup> found that at the implant level, the cumulative survival rates at 3, 5, and 7 years were 99.3%, 99.0% and 98.4% respectively and at the patient level, they were 98.6%, 97.7%, and 95.9%, respectively. After adjustment to possible confounders, the multivariate analysis identified a relationship between the following risk indicators for implant failure: implant location, length and design, timing of implantation, bone grafting procedures and gender. Tissue-Level implants (n = 3863) had a very high survival rate of 99% at 3 years, which was maintained over the entire study period.<sup>7</sup>

In the present study we found that males had 68 and females had 52 dental implants failures. Out of 120 implant failures, 12 were seen in diabetic patients, 14 in smokers, 20 in periodontal diseases and 3 in bruxism. Mittal<sup>8</sup> in his study found that a total of 18 patients experienced 25 implant failures, resulting in an overall survival rate of 96.8% (2.84% and 0.38% early and late implant failures, respectively). The patient-based survival rate was 91.8%. GEE univariate and multivariate analyses revealed that a significant risk factor for implant failure was the maxillary implant. Bone grafting also appeared to be a risk factor for implant failure.

In our study we found that maximum implant failures were seen in type IV bone in 50, type III in 40, type II in 20 and type I in 10 patients. Albrektsson et al<sup>9</sup> proposed success criteria for implant FCDPs based on implant, peri-implant tissues, prosthodontic and subjective parameters. They reported a 95.5% survival rate vs. an 86.7% success rate when their proposed success criteria were applied. FCDPs were deemed as successful when a total of four or fewer complications (mild or moderate severity) were encountered, and these could be addressed chair-side in a single visit.

It can be divided into early failure and late failure according to failure time. First, early failure is one that failed osseointegration within several weeks or several months.<sup>10</sup> It was due to bone necrosis, surgical trauma, bacterial infection, inadequate initial stability and early occlusal loading. Late failure is failure that turns up after functional loading of several period of time. It takes place because of infection and excessive loading.<sup>11</sup>

## CONCLUSION

Dental implant failures were more common in type IV bone, in smokers and patients with periodontitis.

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