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# Original Research

## A retrospective study of assessment of dental implant failure

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***ABSTRACT:***

**Background:** The main challenge of oral implantology is to achieve the functionality of the implants. The present study was conducted to assess dental implant failures in both genders. **Materials & Methods:** 104 patients who received 180 dental implants in last 5 years of both genders were assessed for implant length, diameters, bone type, medical status such as diabetes, hypertension, osteoporosis, smoking, bisphosphonate therapy, periodontitis and antibiotic therapy and implant failure rates was recorded. **Results:** There were 120 heathy and 60 failure implants. Implant diameter (mm) <3.75 had 40 and >3.75 had 20 dental implant failures. Implant length (mm) <10 had 45 and >10 had 15 failure, Bone type I had 0, II had 5, III had 25 and IV had 30 failures. Diabetes had 14, hypertension had 8, osteoporosis had 12, smoking had 6, bisphosphonate therapy had 10, periodontitis had 7 and antibiotic therapy had 3 implant failures. The difference was significant (P< 0.05). **Conclusion:** There was high rate of dental implant failures in subjects with systemic diseases.

**Key words:** dental implant, diabetes, bisphosphonate therapy

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### INTRODUCTION

The main challenge of oral implantology is to achieve the functionality of the implants; however, osseointegration is associated with several factors, such as the reduction of surgical trauma, the shortening of treatment time, and the improved preservation of surrounding bone and soft tissue.[1] In cases with sufficient primary stability, the literature reports that well-planned implant placement produces high efficacy in terms of long-term success and aesthetic result.[2]

Over an observation period of 10 years, a survival rate of 85–95% can be estimated. In 5%, the absence of primary implant integration results in implant failure and an intra-individual accumulation of implant losses might imply the existence of specific risk factors for dental implant failure (DIF).[3] DIF can be divided into early and late events. Early DIF is associated with impaired bone healing. In case of insufficient bone-implant contact, fibrous scar formation leads to a loosening of the bone implant interface.[4] After a latency of 6 months, late DIF occurs. The respective risk factors can be subdivided into iatrogenic, material-associated, and patient-related factors. Side effects during surgery include heat-induced necrosis, poor primary stability, and incorrect positioning. The implants' geometry—including the implant's dimensions and its macro-design—as well as the type of prosthetic treatment does affect loading distribution and in consequence the dental implants' survival rate.[5] Local risk factors include significant plaque accumulation, gingivitis, tight implant-tooth contact, bone quality and quantity, poor oral hygiene, periodontal disorders, and chronic occlusal trauma. Also, systemic factors like xerostomia, osteoporosis, cardiovascular diseases, and diabetes mellitus are reported to influence the patients' wound-healing capability.[6] The present study was conducted to assess dental implant failures in both genders.

### MATERIALS & METHODS

The present study was conducted among 104 patients who received 180 dental implants in last 5 years of both genders. The permission for conducting the study was obtained from institution.

Patients' characteristics such as name, age, gender etc. was retrieved from record file which was in the department. Parameters such as implant length, diameters, bone type, medical status such as diabetes, hypertension, osteoporosis, smoking, bisphosphonate therapy, periodontitis and antibiotic therapy was recorded. Results thus obtained were subjected for statistical analysis. P value less than 0.05 was considered significant.

## RESULTS

**Table I Distribution of patients**

| Gender | Male | Female |
|---|---|---|
| Number | 60 | 44 |
| Implant | 100 | 80 |

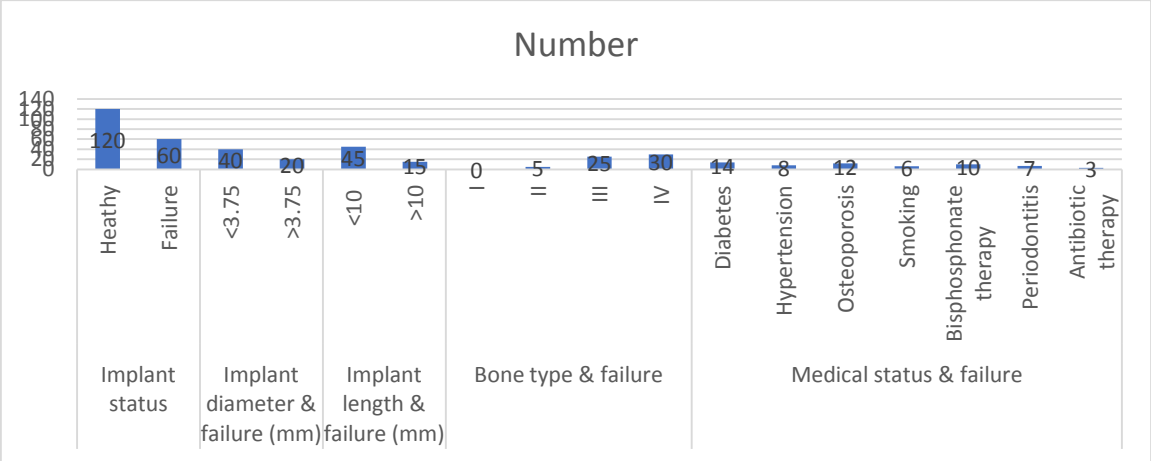
Table I shows that out of 104 patients, 60 males had 100 and 44 females had 80 dental implants.

**Table II Assessment of parameters**

| Parameters | Variables | Number | P value |
|---|---|---|---|
| Implant status | Heathy | 120 | 0.01 |
| | Failure | 60 | |
| Implant diameter & failure (mm) | <3.75 | 40 | 0.02 |
| | >3.75 | 20 | |
| Implant length & failure (mm) | <10 | 45 | 0.05 |
| | >10 | 15 | |
| Bone type & failure | I | 0 | 0.03 |
| | II | 5 | |
| | III | 25 | |
| | IV | 30 | |
| Medical status & failure | Diabetes | 14 | 0.02 |
| | Hypertension | 8 | |
| | Osteoporosis | 12 | |
| | Smoking | 6 | |
| | Bisphosphonate therapy | 10 | |
| | Periodontitis | 7 | |
| | Antibiotic therapy | 3 | |

Table II, graph I shows that there were 120 heathy and 60 failure implants. Implant diameter e (mm) <3.75 had 40 and >3.75 had 20 dental implant failures. Implant length (mm) <10 had 45 and >10 had 15 failure, Bone type I had 0, II had 5, III had 25 and IV had 30 failures. Diabetes had 14, hypertension had 8, osteoporosis had 12, smoking had 6, bisphosphonate therapy had 10, periodontitis had 7 and antibiotic therapy had 3 implant failures. The difference was significant (P< 0.05).

**Graph I Assessment of parameters**




## DISCUSSION

The insertion of osseointegrated dental implants is a reliable treatment option for rehabilitating fully or partially edentulous patients.[7] Despite high success rates, the individual optimization of treatment protocols is crucial for prognosis and patients' satisfaction and analysis of potential risk factors for dental implant failure is an issue of increasing interest.

Several studies have demonstrated various criteria to assess the survival and success rate of dental implants.[8] International Congress of Oral Implantologists (ICOI) Pisa Consensus Conference report suggested that dental implant with mobility, pain on function, or bone loss more than 1/2 of implant length is the sign of failure.[9] The present study was conducted to assess dental implant failures in both genders.

In present study, out of 104 patients, 60 males had 100 and 44 females had 80 dental implants. Mayta-Tovalino et al[10] carried out analytic-multicentric study, where 1279 dental implants that were placed by specialists and variables were evaluated such as variables sex (X1), location (X2), hypertension (X3), antibiotic prophylaxis (X4), diabetes (X5), osteoporosis (X6), bisphosphonates (X7), history of periodontitis (X8), hypercholesterolemia (X9), bone quality (X10), bone quantity (X11), design (X12), smoker (X13), connection (X14), edentulism type (X15), staging (X16), 3D guided surgery (X17), load (X18), bone graft (X19), peri-implantitis (X20), mucositis (X21), and GBR (X22). It was found that the failure rate of the 1279 implants evaluated was 17.98% corresponding to only 23 implants lost as they have good longevity over time. When establishing the best multivariate logistic regression model, it was found that the variables that remained stable in relation to their statistically significant value and more stable confidence intervals were age, osteoporosis, bisphosphonates, history of periodontitis, bone quality, bone graft, connection, number of implants, GBR (guided bone regeneration), and follow-up.

We found that there were 120 heathy and 60 failure implants. Implant diameter e (mm) <3.75 had 40 and >3.75 had 20 dental implant failures. Implant length (mm) <10 had 45 and >10 had 15 failure, Bone type I had 0, II had 5, III had 25 and IV had 30 failures. Diabetes had 14, hypertension had 8, osteoporosis had 12, smoking had 6, bisphosphonate therapy had 10, periodontitis had 7 and antibiotic therapy had 3 implant failures. Staedt et al[11] in their study 9080 implants were inserted during a period of 10 years. In case of DIF, data were classified into early and late DIF and compared to each other in regard of gender, age, site of implantation, implant geometry, and patients' systemic diseases. Three hundred fifty-one implants failed within the observation period (survival rate: 96.13%). Early DIF occurred in 293 implants (83.48%) compared to late DIF in 58 implants (16.52%). Significant earlier DIF was seen in the mandible (OR = 3.729, $p < 0.001$)—especially in the posterior area—and in younger patients ($p = 0.017$), whereas an increased likelihood of late DIF was associated with maxillary implants (OR = 3.729, $p < 0.001$) and older patients. Early DIF is about twice as common as late DIF. Main risk factors for early DIF are implant location in the (posterior) mandible as well as younger age. On contrary, late DIF is rather associated with older patients, cancellous bone quality, and longer implants. Singh et al[12] 26 patients who received 1420 dental implants were studied for length of implant, diameter of implant, location of implant, and bone quality were recorded. Risk factors such as habit of smoking, history of diabetes, hypertension, etc., were recorded. Maximum dental implant failure was seen with length <10 mm (16%), with diameter <3.75 mm, and with type IV bone (20.6%). The difference found to be significant ($P < 0.05$). Maximum dental implant failures were seen with smoking (37%) followed by hypertension (20.8%), diabetes (20.3%), and CVDs (18.7%). Healthy patients had the lowest failure rate (4.37%).

## CONCLUSION

Authors found that there was high rate of dental implant failures in subjects with systemic diseases.

## REFERENCES


1. Al-Nawas B, Kämmerer PW, Morbach T, Ladwein C, Wegener J, Wagner W. Ten-year retrospective follow-up study of the TiOblast dental implant. Clin Implant Dent Relat Res. 2012;14(1):127–34.
2. Le Guehennec L, Soueidan A, Layrolle P, Amouriq Y. Surface treatments of titanium dental implants for rapid osseointegration. Dent Mater. 2007;23(7): 844–54.
3. Weyant RJ, Burt BA. An assessment of survival rates and within-patient clustering of failures for endosseous oral implants. J Dent Res. 1993;72(1):2–8.
4. Peled M, Ardekian L, Tagger-Green N, Gutmacher Z, Machtei EE. Dental implants in patients with type 2 diabetes mellitus: a clinical study. Implant Dent. 2003;12(2):116–22.
5. Mohajerani H, Roozbayani R, Taherian S, Tabrizi R. The risk factors in early failure of dental implants: a retrospective study. J Dent (Shiraz). 2017;18(4): 298–303.
6. Esposito M, Hirsch JM, Lekholm U, Thomsen P. Biological factors contributing to failures of osseointegrated oral implants. (II). Etiopathogenesis. Eur J Oral Sci. 1998;106(3):721–64.
7. Raghavendra S, Wood MC, Taylor TD. Early wound healing around endosseous implants: a review of the literature. Int J Oral Maxillofac Implants. 2005;20(3):425–31.
8. de Jonge LT, Leeuwenburgh SC, Wolke JG, Jansen JA. Organic-inorganic surface modifications for titanium implant surfaces. Pharm Res. 2008;25(10): 2357–69.
9. Alsaadi G, Quirynen M, Komarek A, van Steenberghe D. Impact of local and systemic factors on the incidence of oral implant failures, up to abutment connection. J Clin Periodontol. 2007;34(7):610–7.
10. Mayta-Tovalino F, Mendoza-Martiarena Y, Romero-Tapia P, Álvarez-Paucar M, Gálvez-Calla L, Calderón-Sánchez J, Bolaños-Cardenas R, Diaz-Sarabia A. An 11-year retrospective research study of the predictive factors of peri-implantitis and implant failure: analytic-multicentric study of 1279 implants in Peru. International journal of dentistry. 2019 Jun 24;2019.
11. Staedt H, Rossa M, Lehmann KM, Al-Nawas B, Kämmerer PW, Heimes D. Potential risk factors for early and late dental implant failure: a retrospective

clinical study on 9080 implants. International Journal of Implant Dentistry. 2020 Dec;6(1):1-0.
12. Singh R, Parihar AS, Vaibhav V, Kumar K, Singh R, Jerry JJ. A 10 years retrospective study of assessment of prevalence and risk factors of dental implants failures. Journal of Family Medicine and Primary Care. 2020 Mar;9(3):1617.