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Assessment of Reasons for Dental Implant Failures.

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ABSTRACT

Background: Patients at a higher risk of dental implant failure include those with poor bone quality and quantity. The present study was conducted to assess of reasons for dental implant failures. **Methods**:This study was conducted on 186 patients who underwent dental implant therapy in the last 5 years. Factors such as location, bone quality, smoking habit, medical conditions were retrieved from the patient's record file. **Results**: Out of 124 dental implants, 15 (12%) had failures and out of 140 dental implants in females, 20 (15.7%) had failures. Commonly type IV showed dental implants failures in 15 (37.5%) followed by type III bone in 7 (12.7%), type II bone in 5 (6.94%) and type I bone in 8 (8.24%). Out of 40 diabetics, 5 had a failure, out of 35 hypertensives, 3 had failures, 1 dental implant failures was recorded in 8 patients who received radiotherapy and out of 62 smokers, 7 had failures. Out of 98 implants in maxillary anterior, 7 had failures, 26 in maxillary posterior, 14 had failures, 80 in mandibular anterior, 9 had failures and 60 in mandibular posterior, 5 had failures. **Conclusion**:The authors found that common reason for dental implants failures was smoking, hypertension, radiotherapy type IV bone and female gender.

Keywords: Dental implant, Diabetes, Smoking.

INTRODUCTION

Tooth loss can affect the chewing function and dental esthetics and, therefore, oral-health-related quality of life. Dentists often have to select conventional tooth-supported, implant-supported, or combined tooth–implant-supported prosthetic treatments on the basis of clinical conditions and patients' requirements.[1] Implant-supported dental prostheses are now widely used for the replacement of one or more missing teeth. Moreover, the use of dental implants can often avoid the integration of unrestored adjacent teeth or the use of a removable prosthesis.[2]

Furthermore, replacing missing teeth with endosseous implants, the rehabilitation of edentulous or partially edentulous patients has become a standard of care in the past two decades. Also, in order to achieve and maintain Osseointegration, indications and contraindications must be carefully balanced, and proper patient selection is a key issue in treatment planning.[3] Systemic diseases may impair the host's barrier function and immune defense against periodontal pathogens creating the opportunity for destructive periodontaldisease and likely peri-implantitis. Complications can occur from implant treatment that results in dental implant failure and loss of the implant. Awareness of risk factors that affect a dental implant's long-term success is essential so you're better prepared in case something goes wrong.[4]

Patients at a higher risk of dental implant failure include those with poor bone quality and quantity. Treatment failure is associated with excessive bone loss and impairment of the healing process. Slight bone loss over several years is normal and unlikely to affect a patient's implant directly. A combination of effective oral hygiene at home and professional dental cleaning within the practice is vital to prevent peri-implantitis. It is important that patients take some responsibility for disease prevention.[5] The present study was conducted to assess of reasons for dental implant failures.

MATERIALS AND METHODS

This study was conducted in the department of Prosthodontics on 186 patients who underwent dental implant therapy in the last 5 years. It comprised of 88 males and 98 females. The study protocol was approved bythe institutional ethical committee. All patients were also informed regarding the purpose of the study and their written consent was obtained.

Information such as name, age, gender etc. was recorded. Factors such as location, bone quality,

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smoking habit, medical conditions were retrieved from the patient's record file. Results thus obtained were subjected to statistical analysis. P-value < 0.05 was considered significant.

RESULTS

Table 1: Dental implant failures

Gender	Total Implants	Failures
Male	124	15 (12%)
Female	140	20 (15.7%)

[Table 1] shows that out of 124 dental implants, 15 (12%) had failures and out of 140 dental implants in females, 20 (15.7%) had failures.

Table 2: Implant failure and bone quality

Bone quality	Total Implants	Failures	P-value
Type I	97	8 (8.24%)	0.01
Type II	72	5 (6.94%)	
Type III	55	7 (12.7%)	
Type IV	40	15 (37.5%)	

[Table 2] shows most commonly type IV showed dental implants failures in 15 (37.5%) followed by type III bone in 7 (12.7%), type II bone in 5 (6.94%) and type I bone in 8 (8.24%). The difference was significant (P< 0.05).

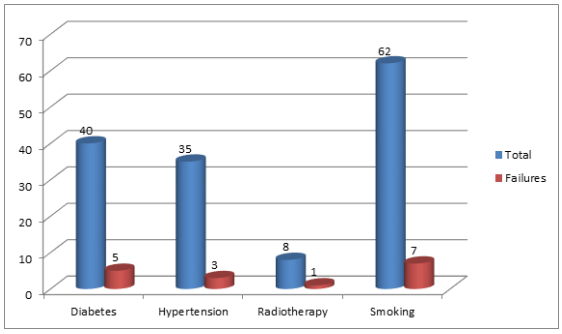

Figure 1: Medical condition and smoking habit

[Figure 1] shows that out of 40 diabetics, 5 had a failure, out of 35 hypertensives, 3 had failures, 1 dental implant failures were recorded in 8 patients who received radiotherapy and out of 62 smokers, 7 had failures.

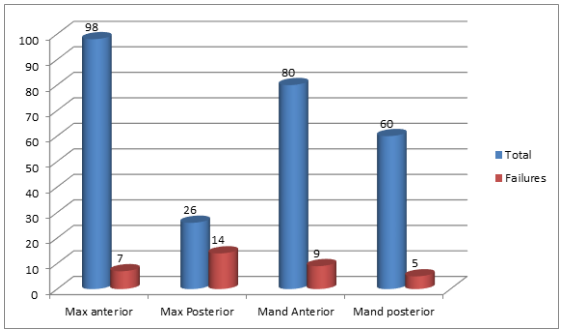

Figure 2: Implant location and failures

[Figure 2] shows that out of 98 implants in maxillary anterior, 7 had failures, 26 in maxillary posterior, 14 had failures, 80 in mandibular anterior, 9 had failures and 60 in mandibular posterior, 5 had failures.

DISCUSSION

With increasing knowledge of wound biology and material sciences, the provision of dental implants as a treatment modality has become increasingly predictable and more commonly used to replace missing teeth. However, without appropriate follow up, peri-implant diseases could develop and affect the long-term success of implants. Currently, there is not enough focus on the prevention of peri-implant diseases, as compared to the definition of the disease, its prevalence, and treatment.6 Factors influencing the successful maintenance of dental implants can be divided into categories: implant, dentist, dental hygienist, and patient. As compared to gingivitis, peri-implant mucositis responds at a different pace to the bacterial challenge, dental practitioners should be aware of how treatment protocols affect long-term success and are vigilant in detecting peri-implant diseases at an early stage.[7] The present study was conducted to assess of reasons for dental implant failures.

In our study, we enrolled 186 (males- 88, females-98) in the study. Out of 124 dental implants, 15 (12%) had failures and out of 140 dental implants in females, 20 (15.7%) had failures. We found that most commonly type IV showed dental implants failures in 15 (37.5%) followed by type III bone in 7 (12.7%), type II bone in 5 (6.94%) and type I bone in 8 (8.24%). Krisam et al,[8]analyzed data from 106 patients with 186 dental implants. The presence of successful healing 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 the incorporation of the final prosthesis. The use of shorter implants (< 10 mm) and the need for augmentation procedures was associated with a greater risk of early implant failure. For shorter implants, the risk was 5.8 times greater than that for longer implants. The use of augmentation procedures increased the risk by a factor of 5.5.

We found that out of 40 diabetics, 5 had a failure, out of 35 hypertensives, 3 had failures, 1 dental implant failures was recorded in 8 patients who received radiotherapy and out of 62 smokers, 7 had failures. Albrektsson et al.[9] proposed success criteria for implant FCDPs based on the 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 were encountered, and these could be addressed chair-side in a single visit.

Out of 98 implants in maxillary anterior, 7 had failures, 26 in maxillary posterior, 14 had failures, 80 in mandibular anterior, 9 had failures and 60 in mandibular posterior, 5 had failures. Peri-implantitis is one of the most common risk factors of dental implant failure, with an estimated prevalence ranging from 10% to 40%. This inflammatory disease shares some similarities to periodontitis. It is caused by bacterial colonisation and a subsequent failure to remove the bacteria from the oral cavity. If left untreated, peri-implantitis can destroy the soft and hard tissue. This results in deterioration of the bone structure supporting the implant and eventual loss of the implant. Smoking can negatively affect the oral microbiome. Potentially, this can alter the peri-implant environment and contribute to the prevalence of peri-implantitis.[10]

Manor et al,[11] consisted of 117 patients that had a history of major medical illness while the control group consisted of 103 patients that did not reveal any history of existing medical conditions. In the study group, designated as group A, out of 117 patients, 57 were females, and 60 were males. In the control group, designated as group B, out of 103 patients, 48 were females, and 55 were males. Group A had 331 implants intact and in the healthy condition which amounted to 83.37% implant success. However, the group had 66 failed implants amounting to 16.63%. Group B had 287 implants intact and in the healthy condition which amounted to 89.96% implant success. However, the group had 32 failed implants amounting to 10.04%.

Smoking can also impede wound healing following implant surgery. Carbon monoxide produced by cigarette smoke has a higher affinity for hemoglobin, which reduces the oxygenation of healing tissue. In addition, the cytotoxic effects of smoking can disrupt body cell repair and defense.[12]

CONCLUSION

The authors found that common reason for dental implants failures was smoking, hypertension, radiotherapy type IV bone and female gender.

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