Original Article

Retrospective evaluation of effect of diabetes on dental implants

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ABSTRACT

Background: The growing economy of developing nations like china and India has also been playing a key role in popularizing the implant dental treatment. In light of above facts, the dental fraternity may encounter with more number of diabetic patients for dental implant treatments. Hence; we planned the present study to assess the effect of diabetes on dental implants.

Materials & methods: The present study included retrospective assessment of effect of diabetes on dental implants. A total of 20 patients were included in the present study with mean age of 39.5 years. The diabetic status for the most part was determined from patient health histories or personal interviews. Success and failure of dental implants were recorded and were analyzed by SPSS software.

Results: In 90 percent of the patients, dental implants were successful while in remaining 10 percent, the implant failure occurred.

Conclusion: Healing in dental implants is affected by uncontrolled diabetes of the patients.

INTRODUCTION

The recent studies in India has shown that the number of diabetic individuals has surpassed the estimate of IDF-2009 i.e., approximately 285 million people worldwide will have diabetes in 2010 and by 2030, 438 million people of adult population is expected to have diabetes with majority of effected population from China, India and USA.[1-4]

The comforts like natural dentition, conservative treatment compared to teeth supported FPDs and long term success for the edentulous patients, as well as partially edentulous patients have made dental implants supported prosthetic treatment as an attractive substitute to traditional removable or fixed dental prosthesis besides being costly and lengthy procedures with surgical intervention. The growing economy of developing nations like china and India has also been playing a key role in popularizing the implant dental treatment. In light of above facts, the dental fraternity may encounter with more number of diabetic patients for dental implant treatments.[5-9] Hence; we planned the present study to assess the effect of diabetes on dental implants.

Materials & methods

The present study included retrospective assessment of effect of diabetes on dental implants. A total of 20 patients were included in the present study with mean age of 39.5 years. The diabetic status for the most part was determined from patient health histories or personal interviews. All patients were questioned about how their disease was being treated, and all were

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urged to strive for optimal metabolic control at the time of implant placement. In all the patients, mandibular implants were placed for the rehabilitation of missing first molars. All the implants were placed in fresh extraction sockets. The average healing period per dental implant was 6.2 months. Success and failure of dental implants were recorded and were analyzed by SPSS software. Chi- square test and univariate regression curve were used for assessment of level of significance.

Results

A total of 20 implants were placed in 20 patients (one implant in each patient). Out of 20, 10 patients were male, while the remaining were females. In 90 percent of the patients, dental implants were successful while in remaining 10 percent, the implant failure occurred.

Table 1: Prognosis of dental implants

1. Parameter	2. No. of implants	3. Percentage
4. Success	5. 18	6. 90
7. Failure	8. 2	9. 10
10. Total	11. 20	12. 100

Graph 1: Prognosis of dental implants
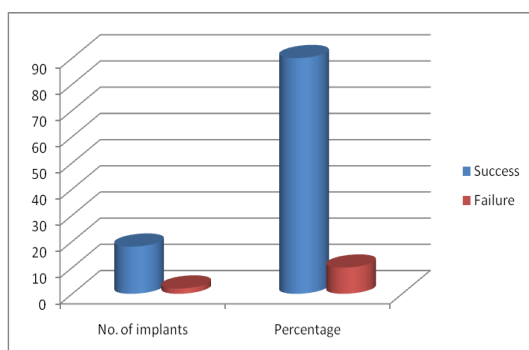
Discussion

In the present study, we observed dental implant failure occurred in 20 percent of the patients. Fiorellini JP et al assessed the success and survival rates of dental implants in diabetic patients. In this retrospective analysis, 215 implants placed in 40 patients at 2 clinical centers were evaluated. Chart reviews and interviews provided medical and implant data. From the analysis, 31 failures occurred, for an overall success rate of 85.6%. Of these failures, 24 occurred within the first year of functional loading. The mean time of functional load was 4.05 +/- 2.6 years. When the success rate was analyzed by implant location, success rates for the maxilla and mandible were 85.5% and 85.7%, respectively. For the anterior and posterior regions, success rates were 83.5% and 85.6%, respectively. The lifetable analysis revealed a cumulative success rate of 85.7% after 6.5 years of function. Based on the data, the survival rate of dental implants in controlled diabetic patients is lower than that documented for the general population, but there is still a reasonable success rate. The increase in failure rate occurs during the first year following prosthetic loading.[10]Balshe AA et al compared the time-dependent cumulative survival rates of smooth- and rough-surface dental implants. Their study included all implants placed and restored in one institution during the two time frames. Data were collected relative to patient age, gender, implant diameter, implant length, and anatomic location of implants. To facilitate the comparison, implants from the first and second time periods were followed through mid-1998 and mid-2007, respectively. Associations of patient/implant characteristics with implant survival were evaluated using marginal Cox proportional hazards models (adjusted for age and gender) and summarized with

hazard ratios and corresponding 95% confidence intervals. A total of 593 patients (322 women and 271 men; mean age, 51.3 +/- 18.5 years) received 2,182 smooth-surface implants between 1991 and 1996, while 905 patients (539 women and 366 men; mean age, 48.2 +/- 17.8 years) received 2,425 rough-surface implants between 2001 and 2005. At 5 years after implant placement, survival rates were 94.0% and 94.5%, respectively, for smooth- and rough-surface implants (difference not significant). Among the smooth implants, implant length <or= 10 mm and anatomic location were identified as significantly associated with implant failure. In contrast, among the rough implants, implant length <or= 10 mm and anatomic location were not identified as risk factors for implant failure. Based on this retrospective study of two groups of patients with different implant surfaces and more than 2,000 implants in each group, there was no significant difference in the survival rates of smooth- and rough-surface dental implants. Anatomic location and implant length <or= 10 mm were associated with failures of the smooth-surface implants only.[11]

Balshi TJ et al reported the results of placing implants in 34 patients with diabetes who were treated with 227 Brånemark implants. At the time of second-stage surgery, 214 of the implants had osseointegrated, a survival rate of 94.3%. Only one failure was identified among the 177 implants followed through final restoration, a clinical survival rate of 99.9%. Screening for diabetes and trying to ensure that implant candidates are in metabolic control are recommended to increase the chances of successful osseointegration. Antibiotic protection and avoidance of smoking should also be considered.[12]

Dental implant survival is initially dependent upon successful osseointegration following placement.

Subsequently, as an implant is restored and placed into function, bone remodeling becomes critical to long-term implant survival in responding to the functional demands placed on the implant restoration and supporting bone. The critical dependence on bone metabolism for implant survival may be a vulnerability for patients with diabetes. Both type 1 and type 2 diabetes have been associated with osteopathic outcomes. Several recent meta-analyses of clinical studies have identified direct associations between type 2 diabetes and increased risk of fracture, however, they failed to find an association between HbA1c levels and fracture risk. These results are also consistent with their finding no association between bone density and HbA1c. Therefore, the importance of glycemic control as a factor for compromised bone metabolism has yet to be realized at a systemic level.[10-12]

Conclusion

From the above results, the authors concluded that healing in dental implants is affected by uncontrolled diabetes of the patients. However; future research is recommended.

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