

Original Research

Success rate of dental implants in medically compromised patients: A retrospective study

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ABSTRACT:

Background: Tooth loss is very common and it can happen as a result of disease and trauma; therefore, the use of dental implants to provide support for replacement of missing teeth has a long and multifaceted history. Hence; the present study was undertaken for assessing the success rate of dental implants in medically compromised patients. **Materials and methods:** The present study was conducted in the department of Oral and maxillofacial surgery of the dental institute. For the study, files of the patients selected for study were grouped into Study group and Control group. Study group consisted of medically compromised patients whereas control group consisted of normal healthy patients. Patient's age, gender and ASA status were studied for demographic profile. **Results:** A total of 50 patients participated in the study. 25 patients belonged to study group and the other 25 patients belonged to control group. The number of failed dental implants in study group was 3 and was 1 in control group. Extraction of dental implant was done for 5 teeth in study group and 6 implants in control group. On comparing the results were statistically significant for failed dental implants. **Conclusion:** Within the limitations of the present study, it can be concluded that failure of dental implant is more prevalent in medical compromised patients.

Keywords: dental implant, oral surgery, edentulous

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INTRODUCTION

Tooth loss is very common and it can happen as a result of disease and trauma; therefore, the use of dental implants to provide support for replacement of missing teeth has a long and multifaceted history.^{1,2,3} Statistics provided by the American Association of Oral and Maxillofacial Surgeons show that 69% of adults ages 35 to 44 have lost at least one permanent tooth to an accident, gum disease, a failed root canal or tooth decay. Furthermore, by age 74, 26% of adults have lost all of their permanent teeth.⁴ Therefore, the use of dental implants reveals that about 100,000-300,000 dental implants are placed per year, which approximates the numbers of artificial hip and knee joints placed per year. A medically compromised patient (MCP) can be described, as the one who has a distinctive physical or mental feature regarding the people of the same age. In this

sort of patients there is a higher risk of interactions between their disease and the implant surgery, implying a higher medical risk. This group need, therefore, to fill in a medical questionnaire and to undergo a previous exhaustive medical examination, which will help not only to determine the specific measures that must be adopted, but also to carry out the estimation of the patient's risk.^{5,6} Hence, the present study was conducted to study success rate of dental implants in medically compromised patients.

MATERIALS AND METHODS

The present study was conducted in the department of Oral and maxillofacial surgery of the dental institute. For the study, files of the patients selected for study were grouped into Study group and Control group. Study group consisted of medically compromised patients whereas control group

consisted of normal healthy patients. Patient’s age, gender and ASA status were studied for demographic profile. Clinical information retrieved from the files of the patients was preoperative, intraoperative and postoperative parameters. The periodontal status of all the patients before implant insertion was stable. The assessment of survival of dental implants was done by evaluating clinical parameters during follow up and information from radiographs. The evaluation was done for implant stability, bone loss, signs of infection and level of bone around implant on the basis of clinical and radiographic situations. The classification of implants was done on the basis of their survival and success rate. The inability of dental implant to survive at its location or exposed threads of implants at follow up visit was determined as parameters for implant failure. The evaluation of number of exposed threads of implants was done using clinical and radiographic data from the records. Based on the determination of previous criteria, implants with more than 1 mm of marginal bone loss in 1st year and 0.2 mm marginal bone loss each subsequent year were considered as failed implants and were grouped accordingly. This criterion is still used today and is known as Bgold standard for implant success. The functional implants without clinical signs of infection or rejection at the examination time even with bone resorption seen radiographically were regarded in implantsurvival rate. The dental implants that meet the criteria for success were included in implant success rate. The evaluation of exposure of implant threads was done by selecting one implant with highest exposed threads as observed during followup visit. For the patients with more than one failed implants, only one implant was considered. Patients with uncontrolled diabetes, uncontrolled hypertension, post-radiation therapy and on IV bisphosphonates treatment were included in the study only after their condition was in stable stage. Patients with incomplete data in files and unavailable to follow up were excluded from the study. The collection of data for the study was done after obtaining ethical clearance from the ethical committee of the institute. The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student’s t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

RESULTS

A total of 50 patients participated in the study. 25 patients belonged to study group and the other 25 patients belonged to control group. The number of failed dental implants in study group was 3 and was 1 in control group. Extraction of dental implant was done for 5 teeth in study group and 6 implants in control group. On comparing the results were statistically significant for failed dental implants. (Table 1, Fig 1).

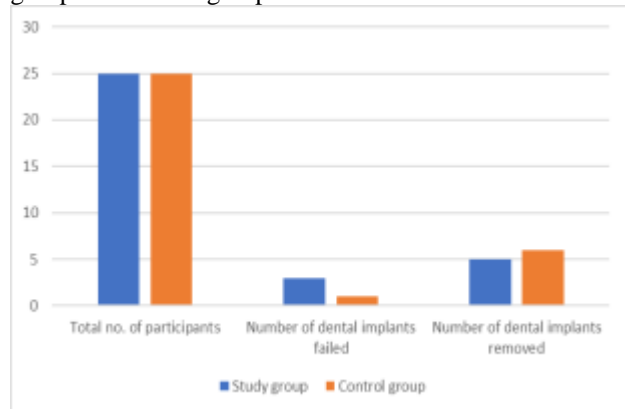
DISCUSSION

In the present study, we observed that the number of failed dental implants in study group was 3 and was 1 in control group. Extraction of dental implant was done for 5 teeth in study group and 6 implants in control group. On comparing the results were statistically significant for failed dental implants. The results were compared with past studies in literature. Gómez-de Diego R et al analysed the indications and contraindications of dental implants in medically compromised patients. A reference research was carried out on PubMed using the key words “implant” AND (oral OR dental) AND (systemic disease OR medically compromised), in articles published between 1993 and 2013. The inclusion criteria were the following: clinical studies in which, at least, 10 patients were treated, consensus articles, reviewed articles and meta-analysis performed in humans treated with dental implants, and which included the disease diagnosis. A total of 64 articles were found, from which 16 met the inclusion criteria.

Table 1: Comparison of success and failure of dental implants among study group and control group

Parameters	Study group	Control group	p-value
Total no. of participants	25	25	0.21
Number of dental implants failed	3	1	0.002
Number of dental implants removed	5	6	0.35

Fig 1: Comparative analysis of dental implants in study group and control group



Cardiac systemic diseases, diabetic endocrine pathologies or controlled metabolic disorders do not seem to be a total or partial contraindication to the placement of dental implants. Tobacco addiction, and head and neck radiotherapy are correlated to a higher loss of dental implants. They concluded that patients suffering from osteoporosis undergoing bisphosphonates therapy show an increased risk of developing bone necrosis after an oral surgery, especially if the drugs are administered intravenously or they are associated to certain concomitant

medication. Nguyen TTH studied 7-mm-long dental implants and clinical outcomes in medically compromised patients. In this study, 33 patients with 47 implants 7-mm long were examined over the last four years. All patients had special medical history and were categorized into 3 groups: systemic disorders, such as diabetes mellitus (controlled or uncontrolled), mental disability, and uncontrolled hypertension; oral cancer ablation with reconstruction, with or without radiotherapy; diverse osteomyelitis, such as osteoradionecrosis and bisphosphonate-related osteonecrosis of the jaw. Most of these patients have insufficient residual bone quality due to mandible atrophy or sinus pneumatization. The implant diameters were 4.0 (n=38), 4.5 (n=8), and 5.0 mm (n=1). Among the 47 implants placed, 2 implants failed before the last follow-up. The survival rate of 7-mm SDIs was 95.74% from stage I surgery to the last follow-up. Survival rates did not differ according to implant diameter. The mean marginal bone loss (MBL) at 3 months, 1 and 2 years was significantly higher than at implant installation, and the MBL at 1 year was also significantly higher than at 3 months. MBL at 1 and 2 years did not differ significantly. Within the limitations of the study, the results indicate that SDIs provide a reliable treatment, especially for medically compromised patients, to avoid sinus lifting or vertical bone grafting. Further, long-term follow-up is needed.^{7,8}

Kim IH investigated outcomes following dental implantation in patients with special needs who required general anesthesia to enable treatment. Patients underwent implant treatment under general anesthesia at the Clinic for the Disabled in Seoul National University Dental Hospital between January 2004 and June 2017. The study analyzed medical records and radiographs. Implant survival rates were calculated by applying criteria for success or failure. Of 19 patients in the study, 8 were males and 11 were females, with a mean age of 32.9 years. The patients included 11 with mental retardation, 3 with autism, 2 with cerebral palsy, 2 with schizophrenia, and 1 with a brain disorder; 2 patients also had seizure disorders. All were incapable of oral self-care due to serious cognitive impairment and could not cooperate with normal dental treatment. A total of 27 rounds of general anesthesia and 1 round of intravenous sedation were performed for implant surgery. Implant placement was performed in 3 patients whose prosthesis records could not be found, while 3 other patients had less than 1 year of follow-up after prosthetic treatment. When the criteria for implant success or failure were applied in 13 remaining patients, 3 implant failures occurred in 59 total treatments. The cumulative survival rate of implants over an average of 43.3 months (15-116 months) was 94.9%. They concluded that for patients with severe cognitive impairment who are incapable of oral self-care, implant treatment under general anesthesia showed a favorable prognosis. Oates TW et al evaluated 10 non-diabetic individuals (12 implants) and 20 persons with type 2 diabetes (30 implants). Glycated hemoglobin (HbA1c)

levels ranged from 4.7-12.6%. Implant stability was assessed by resonance frequency analysis over 4 months following placement. Minimum stability levels were observed 2-6 weeks following placement for all 42 implants. Persons with HbA1c \geq 8.1% had a greater maximum decrease in stability from baseline and required a longer time for healing, as indicated by return of stability level to baseline. This study demonstrates alterations in implant stability consistent with impaired implant integration for persons with type 2 diabetes mellitus in direct relation to hyperglycemic conditions.^{9,10}

CONCLUSION

Within the limitations of the present study, it can be concluded that failure of dental implant is more prevalent in medical compromised patients.

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