

Success & Failure of Dental Implants: A Retrospective Study

Sujan Shetty^{1*} Shisham Verma² Saurabh Kumar Dubey³ Leher Shrivastava⁴ Satish Kumar Chandrakar⁶ Nisha Tripathi⁷

¹Associate Professor, Department of Periodontology, Triveni Institute of Dental Sciences Hospital and Research Centre, Bilaspur, India.

²PG Student, Department of Periodontology, Triveni Institute of Dental Sciences Hospital and Research Centre, Bilaspur, India.

³PG Student, Department of Periodontology, Government College of Dentistry, Indore, India.

⁴Post Graduate Student, Department of Periodontology, Triveni Institute of Dental Sciences Hospital and Research Centre, Bilaspur, India.

⁵Private Consultant, B. M. Shah Hospital, Shastri Nagar Supela, Bhilai, India.

⁶Intern, Department of Periodontology, Triveni Institute of Dental Sciences Hospital and Research Centre, Bilaspur, India.

ABSTRACT

Background: A dental implant is a surgical component that interfaces with the bone of the jaw or skull to support a dental prosthesis such as a crown, bridge, denture, facial prosthesis or to act as an orthodontic anchor. The reasons for implants failure are lack of osseointegration during early healing, infection of the peri-implant tissues and breakage etc. The present study was conducted to evaluate factors leading to dental implant failure.

Materials & Methods: This study was conducted in the department of prosthodontics in year 2015. In this study all the dental implants which were placed from 2011-2015 were included in the study. Data regarding name, age, gender, length of implant, diameter of implant, location of implant, bone quality were retrieved from the patient's case file.

Results: Out of 5000 implants, age group <40 years had males (550) and females (750), age group 41-60 years had males (1500) and females (1250), age group >60 years had males (350) and females (600). Out of 5000 implants, 100 showed failure. The difference was non - significant (P= 1). Out of 500 implants with diameter < 3.75mm showed 10 failures (2%), implants with diameter 3.75- 4.5 mm showed 50 failures (1.6%) while implant with diameter > 4.5mm had 40 failures (0.16%). The difference was significant (P < 0.05). Out of 700 implants placed in bone with type I quality, 2 (0.3%) showed failure. Out of 2200 implants placed in bone with type II quality, 37 (1.68%) showed failure. Out of 1800 implants placed in bone with type III quality, 60 (3.3%) showed failure. Out of 300 implants placed in bone with type IV quality, 1 (0.3%) showed failure. The difference was significant (P < 0.05).

Conclusion: Implant is becoming choice of treatment for missing teeth. Failures are also common which depends on length of implant, diameter of implant, bone quality, region of implant etc. We found that implant >11.5 mm, implant with diameter < 3.75mm, implant placed in mandibular posterior region, implant placed in type III bone showed maximum failures.

Keywords: Bone quality, Failure, Implant.

INTRODUCTION

A dental implant is a surgical component that interfaces with the bone of the jaw or skull to support a dental prosthesis such as a crown, bridge,

denture, facial prosthesis or to act as an orthodontic anchor. Earlier the missing teeth were used to be replaced by either removable or fixed partial denture. Nowadays, dental implants have evolved as new treatment modality for the majority of patients

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*Correspondence Dr. Sujan Shetty.

Department of Periodontology, Triveni Institute of Dental Sciences Hospital and Research Centre, Bilaspur, India.

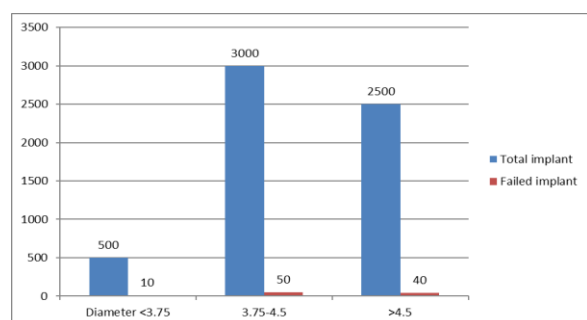
Email: shetsujan@gmail.com

and are expected to play a significant role in oral rehabilitation in the future. The success rate of 90%-95% has been reported over the 10 years.¹ Pain, infection and haemorrhage and occasionally neuropathy are early complications of implant. Implants have got failure rates also. 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, and psychiatric illness, and intravenous bisphosphonate (BPs) use.² But also failed implants have been increased as compared

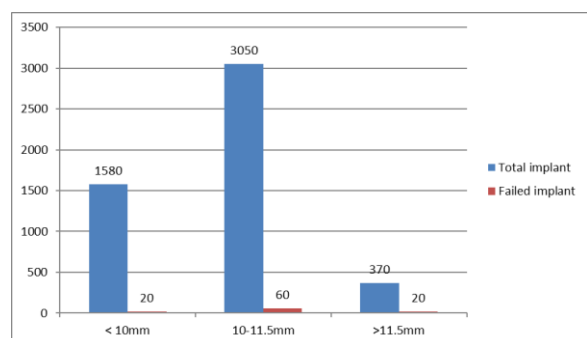
Table 1: Total number of implants.

Age group	Male	Female	Failed implants	P value
<40 years	550	750	25	1
41-60 years	1500	1250	40	
>60 years	350	600	35	
Total	2400	2600	100	

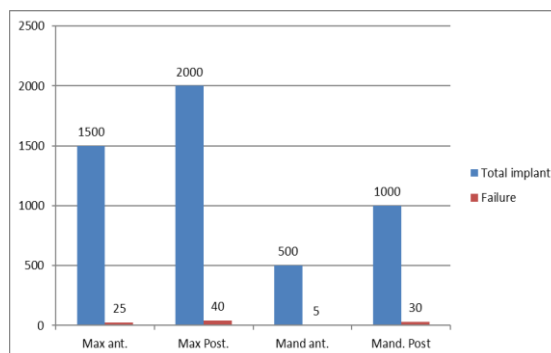
Graph I: Survival rate according to implant diameter.



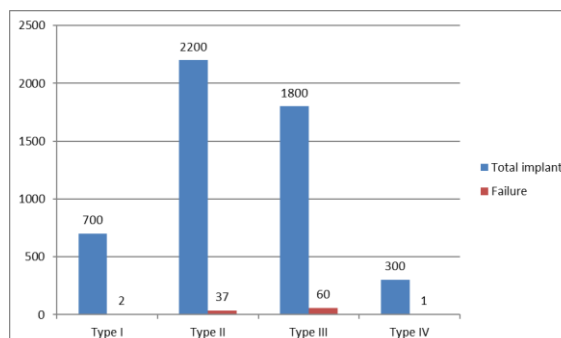
Graph II: Survival rate according to implant length.



Graph III: Survival rate according to location.



Graph IV: Survival rate according to bone quality.



MATERIALS & METHODS

This study was conducted in the department of prosthodontics in year 2015. In this study all the dental implants which were placed from 2011-2015 were included in the study. Data regarding name, age, gender, length of implant, diameter of implant, location of implant, bone quality were retrieved from the patient's case file. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I shows that out of 5000 implants, age group <40 years had males (550) and females (750), age group 41-60 years had males (1500) and females (1250), age group >60 years had males (350) and females (600). Out of 5000 implants, 100 showed failure. The difference was non - significant (P= 1). Graph I shows that out of 500 implants with diameter < 3.75mm showed 10 failures (2%), implants with diameter 3.75- 4.5 mm showed 50 failures (1.6%) while implant with diameter > 4.5mm had 40 failures (0.16%). The difference was significant (P < 0.05).

Graph II shows that implants with length < 10mm showed 20 failures out of 1580 implants (1.26%), implants with length 10- 11.5 mm showed 60 failures out of 3050 implants (1.96%), implants with length >11.5mm showed 20 failures out of 370 implants (5.4%). The difference was significant (P < 0.05). Graph III shows that 1500 implants were placed in maxillary anterior region and 25 (1.66%) showed failure. 2000 implants were placed in maxillary anterior region and 40 (2%) showed failure. 500 implants were placed in mandibular anterior region and 5 (1%) showed failure. 1000 implants were placed in mandibular posterior region and 25 (3%) showed failure. The difference was significant (P < 0.05).

Graph IV shows that out of 700 implants placed in bone with type I quality, 2 (0.3%) showed failure. Out of 2200 implants placed in bone with type II quality, 37 (1.68%) showed failure. Out of 1800 implants placed in bone with type III quality, 60 (3.3%) showed failure. Out of 300 implants placed in bone with type IV quality, 1 (0.3%)

showed failure. The difference was significant (P < 0.05).

DISCUSSION

Missing teeth can be well managed with implants. Due to recent advancements in the field of implants, there use is increasing day by day. Failures in implants are also common. 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. 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. There are many difficulties to figure out the cause of implant success and failure because it is affected by many various factors. It is hard to find a reasonable solution only with in vitro study model.⁴ If it gives a clue to the relationship between failure pattern and risk factor, it is beneficial for us to control and overcome it. And it will be helpful to increase the success rate. The present study was conducted to evaluate factors leading to dental implant failure.

We found that out of 5000 implants were placed from 2011 to 2015 in prosthodontics department. Maximum implants were placed in age group 41-60 years had males (1500) and females (1250). This is in accordance to Busner D et al.⁵ We found that Out of 5000 implants, 100 showed failure with 2%. Our results are in agreement with Esposito M et al.⁶ However, Albrektson et al⁷ found 3.7% failure in his study. We correlated the failure of implants with diameter. We found that maximum failures were seen in implants with diameter < 3.75mm (2%) followed by implants with diameter 3.75- 4.5 mm showed 50 failures (1.6%). This is in agreement with Esposito et al.⁶

We found that maximum failures were seen in implants with length >11.5mm. We found that 20 failures were seen out of 370 implants (5.4%) with length > 11.5mm. This is in agreement with Tonetti MS et al.⁸ In this study, we reported that that 1500 implants were placed in maxillary anterior region and 25 (1.66%) showed failure. 2000 implants were placed in maxillary anterior region and 40 (2%) showed failure. 500 implants were placed in

mandibular anterior region and 5 (1%) showed failure. 1000 implants were placed in mandibular posterior region and 25 (3%) showed failure. Maximum failures were seen in implants placed in mandibular posterior region. This is in accordance to Lekholm U et al.⁹ We evaluated relation of failure with bone quality and found that type III quality bone showed 60 (3.3%) failures. This is in accordance to Tricio J et al.¹⁰

CONCLUSION

Implant is becoming choice of treatment for missing teeth. Failures are also common which depends on length of implant, diameter of implant, bone quality, region of implant etc. We found that implant >11.5 mm, implant with diameter < 3.75mm, implant placed in mandibular posterior region, implant placed in type III bone showed maximum failures.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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