

ORIGINAL RESEARCH

ASSESSMENT OF PROSTHETIC COMPLICATIONS IN DENTAL IMPLANTS

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ABSTRACT

Background: Dental implants have become a valuable alternative to dental prostheses supported by remaining teeth or adjacent oral soft tissues. The present study was conducted to assess prosthetic complications of dental implants.

Materials & Methods: The present retrospective study was conducted on 87 patients who received 120 dental implants of both genders. Type of complications was recorded in all.

Results: Out of 87 patients, males were 40 and females were 47. Age group 18-28 years had 5 males with 8 implants, 6 females with 10 implants, age group 28-38 years had 12 males with 18 implants and 14 females with 21 implants, 38-48 years had 13 males with 7 implants and 12 females with 17 implants, >48 years had 10 males with 13 implants and 15 females with 16 implants. The difference was non-significant ($P > 0.05$). Prosthetic complications were ceramic veneer fracture in 4 cases, prosthesis screw loosening in 3, prosthesis debonding in 2 cases, abutment loosening in 8 cases and abutment fracture in 1 case. The difference was significant ($P < 0.05$).

Conclusion: Authors found that common complications were ceramic veneer fracture, abutment loosening, abutment fracture, prosthesis screw loosening and prosthesis debonding.

Key words: Ceramic veneer fracture, Complications, Dental implant

Introduction

Dental implants have become a valuable alternative to dental prostheses supported by remaining teeth or adjacent oral soft tissues. The method started in the late sixties.¹ During the last decades, metallic implants have become the most frequently used treatment. Titanium is one of the commonly used biomaterials in oral and maxillo-facial surgery.² Excellent clinical results have been obtained with threaded titanium implants by pioneer workers. After more than four decades, dental implantology is now a well-recognized therapeutic advancement in the treatment of partial or complete teeth loss. The technique is reliable and suppresses the use of fixed or removable dentures, which invariably alters the supportive adjacent teeth after a short or medium period.³

The failure of dental implants is not only due to biological factors, such as unsuccessful osseointegration or the presence of peri-implantitis, but they also result from technical complications that involve implant body/fixture fracture, abutment screw fracture, abutment fracture, fractured prosthesis, etc.⁴

The failure of an implant as a single entity, irrespective of its components, may be classified as early or late. Early failures occur shortly after surgery and are characterized by the lack of osseointegration.⁵ In contrast, late failures correspond to those implants that have been regarded as successful for some time, and they occur after prosthetic restoration has been made. There are two main causes for late implant fracture.⁶ The present study was conducted to assess prosthetic complications of dental implants.

Materials & Methods

The present study was conducted among 87 patients who received 120 dental implants of both genders. All were informed regarding the study and written consent was obtained.

Data such as name, age, gender etc. was recorded. All cases were examined carefully on recall basis. All early and late complications were recorded. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of patients

Total- 87		
Gender	Males	Females
Number	40	47

Table I, graph I shows that out of 87 patients, males were 40 and females were 47.

Graph I: Distribution of patients

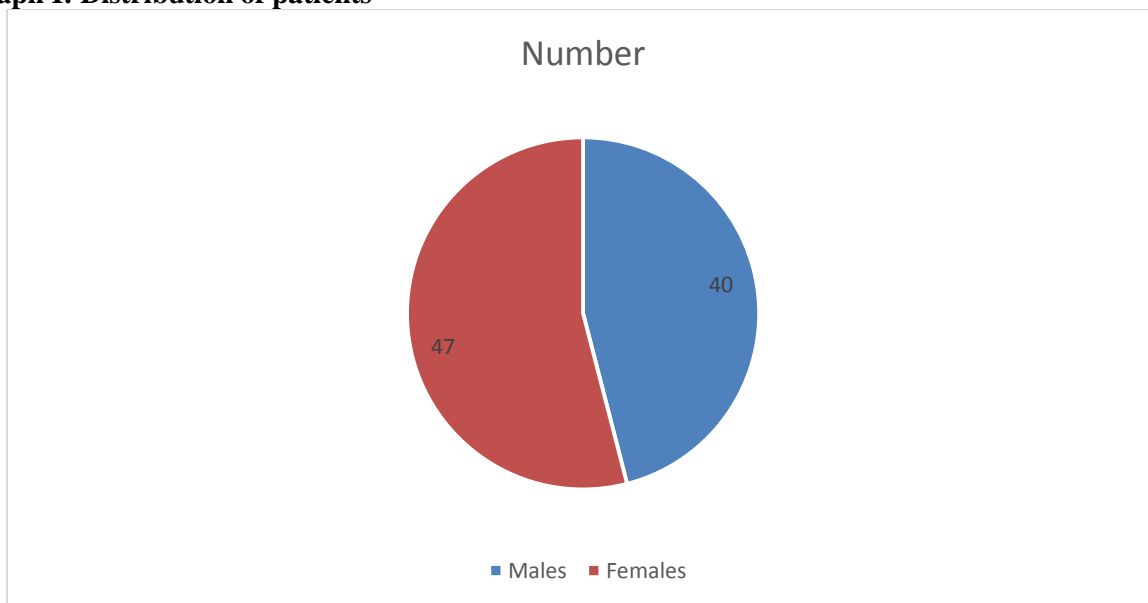


Table II Age wise distribution

Age group (years)	Male	Female	P value
18-28	5 (8)	6 (10)	0.93
28-38	12 (18)	14 (21)	0.95
38-48	13 (17)	12 (17)	0.12
>48	10 (13)	15 (16)	0.24
Total	40 (56)	47 (64)	0.81

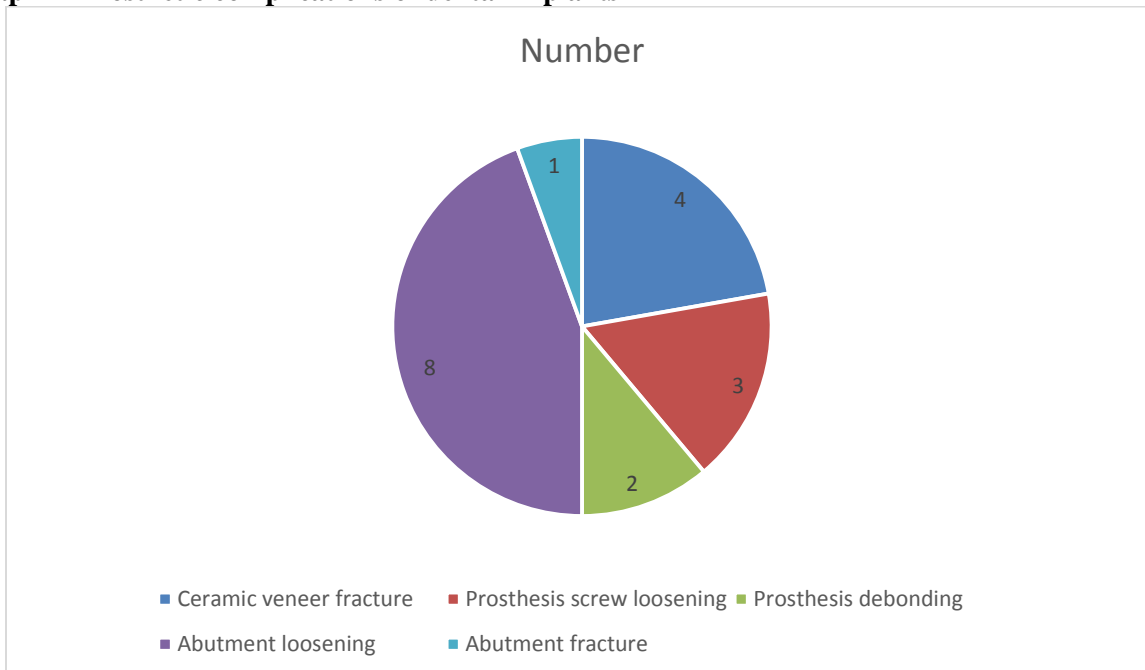
Table II shows that age group 18-28 years had 5 males with 8 implants, 6 females with 10 implants, age group 28-38 years had 12 males with 18 implants and 14 females with 21 implants, 38-48 years had 13 males with 7 implants and 12 females with 17 implants, >48 years had 10 males with 13 implants and 15 females with 16 implants. The difference was non-significant ($P > 0.05$).

Table II Prosthetic complications of dental implants

Complications	Number	P value
Ceramic veneer fracture	4	0.05
Prosthesis screw loosening	3	
Prosthesis debonding	2	
Abutment loosening	8	
Abutment fracture	1	

Table III, graph II shows that prosthetic complications was ceramic veneer fracture in 4 cases, prosthesis screw loosening in 3, prosthesis debonding in 2 cases, abutment loosening in 8 cases and abutment fracture in 1 case. The difference was significant ($P < 0.05$).

Graph II Prosthetic complications of dental implants



Discussion

Dental implants are now the preferred line of treatment for the replacement of missing teeth. Additionally, implant-supported full-mouth prosthesis are a good treatment option for patients who are completely edentulous, achieving a comprehensive and functional oral rehabilitation.⁷ Implant failures are categorized as primary, when the body is unable to establish osseointegration, or secondary, when the body is unable to maintain the achieved osseointegration and a breakdown process results. Modern implantology was made possible thanks to Brånemark's studies in the 1960s in Sweden.⁸ He was the first to propose the concept of osseointegration of a metallic biomaterial implanted in bone. In an experimental study, he found that bone was firmly anchored at the surface of titanium devices implanted into bony defects. From this observation, he concluded that biocompatibility and excellent bone-titanium bonding were the major biological properties of this metal.⁹ This also led to the creation of a bone screw (he called it a fixture) that he implanted in different bone sites. In each location, implantation was

successful and the screw remained fixed in the bone. He originally designed a fixture to be implanted in the temporal bone to support ear prosthesis in maxilla-facial surgery.¹⁰ The present study was conducted to assess prosthetic complications of dental implants.

We observed that out of 87 patients, males were 40 and females were 47. Adell et al¹¹ proposed that osseointegration could be lost because of surgical trauma, perforation through the covering mucoperiosteum during healing, or repeated overloading with microfractures of the perifixtural bone at early stages.

We found that age group 18-28 years had 5 males with 8 implants, 6 females with 10 implants, age group 28-38 years had 12 males with 18 implants and 14 females with 21 implants, 38-48 years had 13 males with 7 implants and 12 females with 17 implants, >48 years had 10 males with 13 implants and 15 females with 16 implants. Gallucci et al¹² conducted a multi-centre prospective study to evaluate the 5 years survival rate and success associated with the use of mandibular implant supported prosthesis. The parameters that were evaluated were Sulcus bleeding index (SBI) at four sites per implant, width of facial and lingual keratinized gingival (mm), peri-implant mucosal level, modified plaque index, mobility and peri-implant radiolucency.

We found that prosthetic complications were ceramic veneer fracture in 4 cases, prosthesis screw loosening in 3, prosthesis debonding in 2 cases, abutment loosening in 8 cases and abutment fracture in 1 case. Meffert¹³ proposed that the minimum space between an implant and a neighboring natural tooth should not be less than 1.5 mm to avoid impairment of the blood supply of the periodontal ligament, whereas the minimum space between two adjacent implants should be 3 mm to avoid overheating with subsequent death of the bone cells.

Brunski¹⁴ stated that micromotion of more than 100µm should be avoided. Motion greater than this level would cause the wound to undergo fibrous tissue repair rather than the desired osseous regeneration. But this is hard to apply practically. In fact, the precise level of micromotion that can be tolerated without being significantly inhibiting to bone formation is unknown. Some authors applied the immediate loading of implants with certain criteria with a high degree of success, whereas others reported an early failure rate for immediate loaded fixture seven times higher than that recorded for delayed cases.

Conclusion

Authors found that common complications were ceramic veneer fracture, abutment loosening, abutment fracture, prosthesis screw loosening and prosthesis debonding.

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