

# Assessment of Prosthetic Complications Associated with Dental Implants: An Observational Study

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## ABSTRACT

**Background:** Clinical prosthodontics, during the past decade, has significantly improved and developed according to the advancements in the science and patient's demands and needs. Despite its high success rate, failure and complications are often associated with dental implant treatment due to a number of factors. Hence; we planned the present study to assess the prosthetic complications of dental implants.

**Materials & Methods:** The present study included assessment of various prosthetic complications in patients undergoing dental implant procedures. A total of 200 patients scheduled to undergo dental implants for missing mandibular first molar were included in their study group. Dental implants were placed in all these patients by skilled oral implantologist. Follow-up was done in all the patients' upto 2 years for assessing the incidence of occurrence of complications.

**Results:** Prosthetic complications were present in 3 percent of the total patients included in the present study. Among these complications, most commonly encountered were fracture of veneering porcelain followed by abutment fracture, loosening of abutment, prosthetics framework fracture and screw fracture.

**Conclusion:** Dental implant procedure is a technique sensitive procedure and is often associated with prosthetic complications. Therefore, special care should be taken while placing dental implants and while preparing its prosthetic part, so that prognosis of dental implants could be improved.

**Key words:** Dental Implants, Prognosis, Prosthetic.

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## INTRODUCTION

Stomatognathic system is one organ of the body, which is most frequently affected and handicapped with sequelae of oral and dental diseases. Thus handicapped stomatognathic system by the loss of teeth, affects ingestion, mastication, deglutition and nutrition, which formulates the vital chain for human existence.<sup>1-3</sup> Clinical prosthodontics, during the past decade, has significantly improved and developed according to the advancements in the science and patient's demands and needs.<sup>4,5</sup>

Conventional options in prosthodontics for substituting a missing single tooth include the removable partial denture, partial and full coverage bridgework, and resin-bonded bridgework.

Advancements in the field of odontology can be highlighted in terms of osseointegrated dental implants. Despite its high success rate, failure and complications are often associated with dental implant treatment due to a number of factors.<sup>6-8</sup>

Hence; we planned the present study to assess the prosthetic complications of dental implants.

## MATERIALS & METHODS

The present study was conducted in the department of Dentistry, Nalanda Medical College and Hospital, Patna, Bihar (India) and it included assessment of various prosthetic complications in patients undergoing dental implant procedures. Ethical approval was obtained from the ethical committee of the institution and written consent was obtained from all the patients after explaining in detail the entire implant procedure. A total of 200 patients scheduled to undergo dental implants for missing mandibular first molar were included in their study group. Diabetic patients, hypertensive patients and patients with history of any other systemic or metabolic illness were excluded from the present study. Dental implants were placed in all these patients by skilled oral implantologist. Follow-up was done in all the patients' upto 2 years for assessing the incidence of occurrence of prosthetic complications. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

**Table 1: Demographic data**

Age group	n	%
Less than 25 years	50	25
26 to 40 years	80	40
More than 40 years	70	35
<b>Total</b>	<b>200</b>	<b>100</b>

**Table 2: Gender distribution**

Gender	n	%
Males	116	58
Females	84	42
<b>Total</b>	<b>200</b>	<b>100</b>

**Table 3: Prosthetic complications**

Prosthetic complications	Frequency
Abutment fractured	1
Abutment becoming loose	1
Fracture of veneering porcelain	2
Prosthesis framework fracture	1
Screw fracture	1
<b>Total complications</b>	<b>6</b>

## RESULTS

In the present study, a total of 200 patients were included who underwent prosthetic rehabilitation of missing mandibular first molar by dental implants. Mean age of the patients of the present study was 39.5 years. Majority of the patients belonged to the age group of 26 to 40 years. 58 percent of the patients of the present study were males while remaining were females. Prosthetic complications were present in 3 percent of the total patients included in the present study. Among these complications, most commonly encountered were fracture of veneering porcelain followed by abutment fracture, loosening of abutment, prosthetics framework fracture and screw fracture.

## DISCUSSION

Implantology belongs to the fast growing area in dental medicine due to its innovations and advancement with regards to medical and technical developments. Out of the various treatment modalities available for replacing missing/unrestorable teeth, treatment with tissue-integrated supported prosthesis have now become an integral and essential part, and today many patients have been successfully treated with benefit of tissue-integrated supported prosthesis.<sup>9</sup> Hence; we planned the present study to assess the prosthetic complications of dental implants.

A total of 200 patients were included in the present study who underwent prosthetic rehabilitation of missing mandibular first molar by dental implants. Mean age of the patients of the present study was 39.5 years. Majority of the patients belonged to the age group of 26 to 40 years. Nedir R et al evaluated prosthetic complication was performed on 236 patients treated with 528 implants in an 8-year private practice experience. The study sample included 55 overdentures (ODs) and 265 fixed partial dentures (FPDs). Among the latter, 231 FPDs were cemented and 34 were screw-retained. The type and frequency of prosthetic

incidents were recorded, including adjustments and complications. Statistical analysis was performed using a chi-square test to identify risk factors associated with complications. Over this period, 1 abutment fractured and 2 became loose, leading to a cumulative implant component success rate of 99.2%. Patients with removable prostheses had more complications than those with fixed ones, 66.0% versus 11.5%; the difference was significant ( $P < .001$ ). Posterior fixed prostheses had more complications than anterior ones, 11.0% versus 0%; however, the difference was not significant ( $P = .16$ ). The complication rates for cemented and screw-retained prostheses did not differ significantly (10.4% versus 5.9%;  $P = .61$ ). Prostheses with an extension cantilever had more complications, 29.4% versus 7.9%; the difference was significant ( $P = .01$ ). In the OD group, the ball-retained prostheses had a significantly higher rate of complications than the bar-retained ones. In the FPD group, complications were not recurrent; most occurred during the first 2 years, and the rate of complications did not increase with time. In the OD group, 1.3 incidents per prosthesis were recorded. Incidents were often recurrent, and the rate of complications did not decrease with time. Removable and fixed prostheses were associated with complications at different frequencies and of different types. In the removable group, adjustments and foreseeable complications were numerous, recurrent, and usually easy to manage. Bar-retained prostheses had fewer complications than ball-retained ones. In the fixed group, complications were limited in number and did not increase with time.<sup>10</sup>

In the present study, 58 percent of the patients of the present study were males while remaining were females. Prosthetic complications were present in 3 percent of the total patients included in the present study. Among these complications, most commonly encountered were fracture of veneering porcelain followed by abutment fracture, loosening of abutment, prosthetics framework fracture and screw fracture. Brägger U et al compared the frequency of biological and technical complications with fixed partial dentures (FPDs) on implants, teeth and as mixed tooth-implant supported FPDs over 4 to 5 years of function. All implants belonged to the ITI Dental Implant System. Group I-I (implant FPD) included 33 patients with 40 FPDs, group T-T (tooth FPDs) 40 patients with 58 FPDs, group I-T (mixed tooth-implant FPDs) 15 with 18 FPD. Of the bridge abutments 144 were teeth and 105 were implants. The median number of units replaced by the FPDs was 3 (range 2-14). The mean age of the patients was 55.7 years (range 23-83). Complete failures resulted in the loss of one FPD in each group. Two implants were lost due to fracture secondarily to development of a bone defect. One tooth had a vertical fracture and 1 tooth was lost due to periodontitis. Biological complications (peri-implantitis, PPD  $\geq$  5 mm and BOP+) occurred at 9.6% (10) of the implants. This number was, however, reduced to 5% if the threshold for definition of peri-implantitis was set at PPD  $\geq$  6 mm and BOP+. Biological complications occurred in 11.8% (17) of the abutment teeth (NS compared to implants); 2.8% (4) had secondary caries, 4.9% (7) endodontic problems and 4.1% (6) had periodontitis (PPD  $\geq$  5 mm, BOP+). Ten out of 32 patients with a general health problem indicated a biological complication, whereas 9 out of 53 patients with no general health problem had a biological complication (chi 2: NS). Statistically significantly more technical complications were found in FPDs on implants (chi 2,  $P < \text{or} = 0.05$ ). The technical complications were associated with

bruxism. Out of 10 bruxers 6 had a technical complication whereas 13 out of 75 non-bruxers had such a complication ( $\chi^2 < \text{or} = 0.01$ ). Extensions were associated with more technical complications (13 out of 35 with extensions versus 9 out of 81 without). In conclusion, favourable clinical conditions were found at tooth and implant abutments after 4-5 years of function. Loss of FPD over 4-5 years occurred at a similar rate with mixed, implant or tooth supported reconstructions. Significantly more porcelain fractures were found in FPDs on implants.<sup>11</sup>

## CONCLUSION

Under the light of above obtained data, the authors conclude that dental implant procedure is a technique sensitive procedure and is often associated with prosthetic complications. Therefore, special care should be taken while placing dental implants and while preparing its prosthetic part, so that prognosis of dental implants could be improved. However; further studies are recommended for better exploration of this field of medicine.

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