



Retrospective analysis of complications associated with implant supported partial dentures

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Abstract

Background: one of the frequent problem encountered in patients in whom dental implants were used for prosthetic rehabilitation are the mechanical complications. The main technical complications occurring with implant-supported prostheses, which can lead to failure or the need for repairs, are screw fracture, screw loss, loss of resin covering the screw, fracture of the metallic, resin or porcelain structure and loss of over-denture retention. Although implant-supported prostheses constitute a safe, predictable treatment method with high success rate, technical and biological complications can occur with dental implants. Hence; we assessed the technical complications occurring in patients with dental implant supported fixed partial dentures. **Materials & methods:** The present was conducted in the department of prosthodontics and oral implantology of the dental college and institution Sand included retrospective assessment of the all those patients who underwent prosthetic rehabilitation of the partial edentulous areas by dental implant procedures from 2011 to 2013. Edentulous areas were rehabilitated by fixed partial dentures (FPD) supported by dental implants. All the patient related and dental implant related parameters were analyzed and recorded for assessment. Opposing dental occlusion was categorized as the eligibility criteria for selecting patients in the present study. Follow-up records of the patients were maintained, recorded and analyzed. Univariate regressive analysis was used for the assessment of the level of significance. **Results:** Solid and syn dental implants were inserted in 81 and 54 patients respectively. As far as type of structure of the implant related restoration is concerned, single crown were placed in 69 patients while splinted crown and three unit crowns were placed in 69, 31 and 35 patients respectively. In context to the number of dental implants, in 85 and 50 patients, dental implants were placed in molar region and premolar region respectively. Fractured dental implants in maxillary region were reported in 3 cases while in mandibular region were reported in 2 cases. Replacement of the prosthetic restorations was done in 3 and single case in maxillary and mandibular region. Single crowns were fractured and replaced in single case while single crowns were fractured and repaired in two cases. **Conclusion:** Rate of occurrence of technical complications in dental implant related fixed partial prosthesis is very low

Key words: Complication, Dental implants, Prosthetic

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INTRODUCTION

Mechanical complications are the most common problems encountered in patients who had received prosthetic rehabilitation of edentulous areas by dental implants.

The combination of implant-bone anchoring, the attachment of prosthetic components with screws, and the dynamics involved result in a complex load with frequent loosening and fracture of the components of the implant supported prostheses.¹ An important influence on the outcome of these prostheses is

conducted by the design characteristics of the prostheses and implants, the materials employed and biomechanical issues.² The main technical complications occurring with implant-supported prostheses, which can lead to failure or the need for repairs, are screw fracture, screw loss, loss of resin covering the screw, fracture of the metallic, resin or porcelain structure and loss of overdenture retention.³ Technical and biological complications can occur with dental implants despite the proven fact in the literature that hypothesis that implant-

supported prostheses constitute a safe, predictable treatment method with high success rate.⁴ Hence; we assessed the technical complications occurring in patients with dental implant supported fixed partial dentures.

MATERIALS & METHODS

The present was conducted in the department of prosthodontics and oral implantology of the dental college and institution Sand included retrospective assessment of the all those patients who underwent prosthetic rehabilitation of the partial edentulous areas by dental implant procedures from 2011 to 2013. Edentulous areas were rehabilitated by fixed partial dentures (FPD) supported by dental implants. Ethical approval was taken from the institutional ethical committee in written and consent was obtained after explaining them the entire research protocol. Inclusion criteria for the present study were as follows:

Patients with age group of 25 to 45 years, Patients with negative history of any systemic illness, Patients with absence of any known drug allergy, Patients who underwent any surgical procedure in the oral cavity in the past two years. All the patient related and dental implant related parameters were analyzed and recorded for assessment. Assessment of the following parameters was done:

- Restoration type,
- Amount of supporting dental implants,
- Abutment type,
- Dental arch in which implants were placed,
- Presence of any deleterious oral habit,
- Demographic details of the patients

Opposing dental occlusion was categorized as the eligibility criteria for selecting patients in the present study. Glass ionomer cement was used for cementing the definitive metal ceramic restoration. Connection of the dental implants and natural teeth occurred in none of the cases. Follow-up records of the patients were maintained, recorded and analyzed. All the results were analyzed by SPSS software. Student t test and univariate regressive analysis were used for the assessment of the level of significance.

RESULTS

Various dental implants related parameters are highlighted in **Table 1**. Solid and syn dental implants were inserted in 81 and 54 patients respectively. As far as type of structure of the implant related restoration is concerned, single crown were placed in 69 patients while splinted

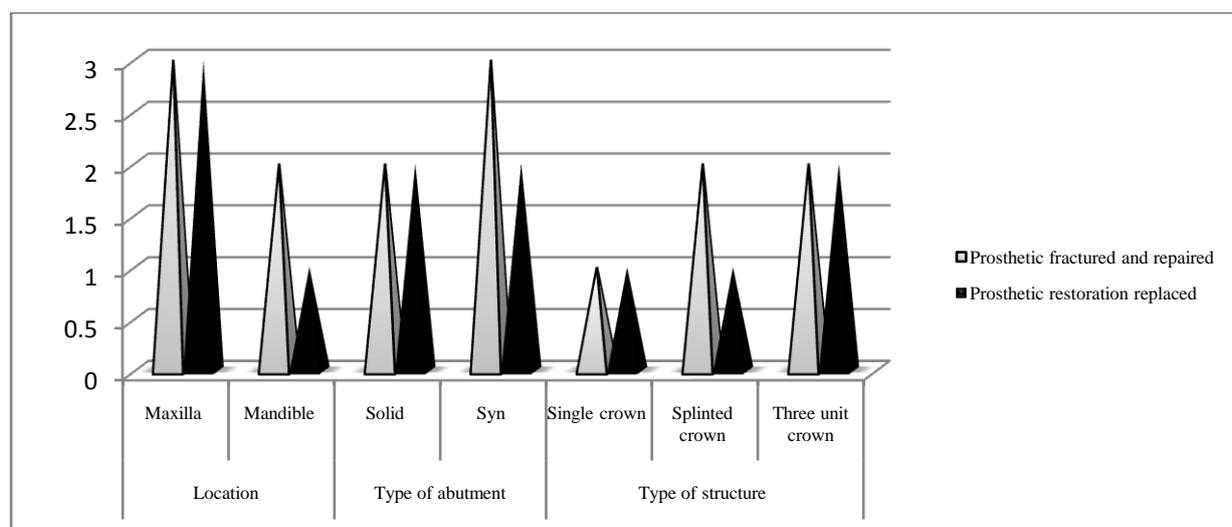
crown and three unit crowns were placed in 69, 31 and 35 patients respectively. In context to the number of dental implants, in 85 and 50 patients, dental implants were placed in molar region and premolar region respectively. **Graph 1** shows the complications related to dental implants. Fractured dental implants in maxillary region were reported in 3 cases while in mandibular region were reported in 2 cases. Replacement of the prosthetic restorations was done in 3 and single case in maxillary and mandibular region. Single crowns were fractured and replaced in single case while single crowns were fractured and repaired in two cases.

Table 1: Various dental implant related parameters

Parameter		No. of patients
Type of abutment	Solid	81
	Syn	54
Type of structure	Single crown	69
	Splinted crown	31
	Three unit crown	35
No. of dental implants	Molar region	85
	Premolar regions	50

DISCUSSION

Dental implants are one of the most efficient procedures used routinely these days for the prosthetic rehabilitation of partial edentulous areas. When dental implant related prosthetics are used for restoration of partially and completely edentulous areas, many of the problems reported by conventional complete denture wearers can be eliminated.⁵ It has already been established through longitudinal clinical studies, structured reviews, and consensus conferences, that the survival of root form titanium implants is very high in the anterior mandible and that the incidence of surgical complications is very low.⁶ Furthermore, it has been shown that implants reduce the rate of resorption of the residual ridge in the anterior mandible. Stability of implant supported prosthesis increases the stability of the dentures.⁷ Hence; we assessed the technical complications occurring in patients with dental implant supported fixed partial dentures. In the present study, we observed that rate of occurrence of technical complications in association with dental implant supported fixed partial dentures is very low. These results were in

Graph 1: Complications related to implant supported dentures

correlation with the results of previous studies in which the authors observed similar findings associated with lower complication rates in patients receiving implant supported prosthesis.^{8,9} Cordaro et al evaluated the success rate of dental implants, their prosthetic part related complications and various other implant related complications including reduction in periodontal support. They analyzed 19 patients with residual teeth that served as abutments were consecutively treated with combined tooth- and implant-supported complete-arch fixed prostheses and were retrospectively evaluated after a period varying from 24 to 94 months. They observed that 9 patients showed reduced periodontal support as a result of periodontal disease and treatment, and 10 patients had normal periodontal support of the abutment teeth. Ninety implants and 72 tooth abutments were used to support 19 fixed partial dentures. Screw- and cement-retained metal-ceramic and metal-resin prostheses were fabricated with rigid and nonrigid connectors. Over 24 to 94 months follow-up, they observed loss of only one dental implant out of total of 90 dental implants. From the results, they concluded that complete-arch fixed prosthesis supported by implant and tooth abutments may be associated with intrusion of teeth with intact periodontal support when nonrigid connectors are used to join the implant- and tooth-supported sections of the prostheses.¹⁰ Nickenig analyzed the clinical outcome results of tooth-implant-supported fixed and removable partial dentures in a selected population group of partially edentulous patients. They conducted a retrospective study and analyzed 224 patients with

a mean age of 51.3 years were carried out. From the results, they concluded that the survival data for both types of prosthesis were comparable to prostheses supported solely by implants. There was no difference in the complication rate between primary splinting (fixed) and secondary splinting with telescopic systems (removable).¹¹ Brägger 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. From the results, they concluded that no significant association exists between impaired general health status biological failures but bruxisms as well as extensions were associated with more technical failures.¹² Wang et al evaluated the clinical effectiveness of one-piece implant-supported detachable telescopic fixed bridge in edentulous patients. They analyzed 17 patients and observed that radiography showed stable bone levels for all implants except 2 implants, which were observed slight marginal bone resorption. From the results, they concluded that One-piece implant-supported detachable telescopic fixed bridge is an effective method with satisfactory long-term aesthetic and stable outcomes in edentulous patients.¹³ Engelhardt retrospectively analyzed data of 32 patients supplied with implant-supported and Locator-attached overdentures were screened for prosthetic complications and maintenance requirements, which were recorded and statistically analyzed. Mean observation time was 4.78 ± 1.72 years. Loss of retention was the most frequently observed event ($n = 22$). Damage and exchange of the insert

holders (n = 4) and loosening of locator attachments (n = 2) and fracture of the insert holder (n = 2) were uncommon events; no loss of locator attachments was observed. From the results, they concluded that in Locator-attached overdentures, loss of retention is a frequent finding.¹⁴

CONCLUSION

From the above results, the authors concluded that rate of occurrence of technical complications in dental implant related fixed partial prosthesis is very low. However, future studies with larger study group and more number of parameters are required for improving the long term prognosis of dental implants.

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