

Study to Evaluate the Complications with Implant Supported Overdenture for Partially and Completely Edentulous Ridges

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ABSTRACT

Background: Implant retained overdenture are the most reliable treatment options for partially edentulous and completely edentulous patients to address the problems associated with dentures such as lack of stability and retention. Outcome of implant therapy is no longer measured by survival of implant alone, but by aesthetic and functional success of the prostheses.

Aim: To evaluate the complications with implant supported overdenture for partially and completely edentulous ridges.

Materials and method: The present study was conducted in the department of prosthodontics of the dental institution. A total of 36 patients with 66 dentures participated in the study, of which 41 were mandibular and 25 were maxillary. 23 patients were males and 13 patients were females. The mean age of the patients was 57.32 years, ranging from 38- 88 years. The technique used for placement of implant was either a conventional 2-stage loading technique or 1-stage immediate loading technique.

Results: The most common complication observed was denture fracture in fully edentulous dentures, followed by artificial tooth fracture. In case of partially edentulous dentures, 1 case each of magnet attachment detachment, 4 cases of denture fracture and 3 cases of artificial tooth fracture were observed. The results were found to be statistically significant for denture fracture and artificial tooth fracture.

Conclusion: The most common prosthetic complication experienced by patients having implant supported overdenture was denture fracture followed by artificial tooth fracture.

Keywords: Dental implant, Overdenture, denture fracture.

INTRODUCTION

Problems associated with a complete denture, such as lack of stability and retention, can be solved with the use of implant-retained or implant-supported overdentures. However, controversy exists as to the anchorage system used

and indications for both the maxilla and mandible.^{1,}

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but by aesthetic and functional success of the prostheses. Fracture of denture base is one of the prosthodontic complications seen with implant retained overdentures with ball attachments.^{3,4} However, it is difficult to achieve optimal denture retention and stability with severely resorbed mandibular ridge. Thus, the overdenture assisted by osseointegrated implant is an attractive treatment because of its relative simplicity, minimal invasiveness, and economic feasibility.^{5, 6} Hence, the present study was planned to evaluate the complications with implant supported overdenture for partially and completely edentulous ridges.

MATERIALS AND METHOD

The present study was conducted in the department of prosthodontics of the dental institution. The ethical clearance for the study protocol was obtained from ethical committee of the institute. For the study, selection of edentulous patients rehabilitated using implant denture by the department was done. At the initial stage of treatment, it was made sure that patients don't have any systemic illness such as diabetes, history of cardiac disease, congenital oral defects, Sjogren's syndrome, history of corticosteroids. A total of 36 patients with 66 dentures participated in the study, of which 41 were mandibular and 25 were maxillary. 23 patients were males and 13 patients were females. The mean age of the patients was 57.32 years, ranging from 38- 88 years. The technique used for placement of implant was either

a conventional 2-stage loading technique or 1-stage immediate loading technique. On the basis of availability of bone, the length of implant varied from 8.5 to 16 mm. The diameter of implant varied from 3.3 to 5.0 mm. The implant position, number of implants, design for retainer, denture design, survival rate of implant and prosthetic complications were recorded for each denture and patient and stored for evaluation.

The statistical analysis of the data was done using SPSS program (version 16.0) for windows. The significance of the data was checked using Chi-square test and Student's t-test. A p-value <0.05 was predefined to be statistically significant.

RESULTS

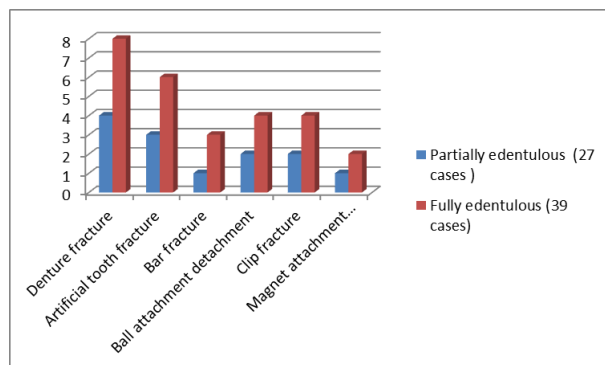
A total of 36 patients participated in the study. 66 implant supported dentures, 41 mandibular and 25 maxillary were given to these patients. Based on sex of patients, 23 were males and 13 were females. **Table 1** shows the prosthetic complications experienced in partially edentulous (n=27) and fully edentulous (n=39) patients. The most common complication observed was denture fracture in fully edentulous dentures, followed by artificial tooth fracture. In case of partially edentulous dentures, 1 case each of magnet attachment detachment, 4 cases of denture fracture and 3 cases of artificial tooth fracture were observed (**Fig 1**). The results were found to be statistically significant for denture fracture and artificial tooth fracture ($p>0.05$).

Table 1: Prosthetic complications experienced in partially and fully edentulous patients.

Prosthetic complications	Partially edentulous (27 cases)	Fully edentulous (39 cases)	p-value
Denture fracture	4	8	0.03*
Artificial tooth fracture	3	6	0.002*
Bar fracture	1	3	0.11
Ball attachment detachment	2	4	0.9
Clip fracture	2	4	0.12
Magnet attachment detachment	1	2	0.74

*-Statistically significant

Fig 1: Showing Prosthetic complications experienced in partially and fully edentulous patients.



DISCUSSION

The current study was planned to evaluate the prosthetic complications experienced by implant over-denture patients. In our study, 36 patients having 66 implant supported dentures participated. The number of partially edentulous dentures was 27 and completely edentulous was 39. We observed that the most common prosthetic complication observed by patients of complete edentulous denture or partially edentulous denture was denture fracture followed by artificial tooth fracture. The results are consistent to other studies. Andreiotelli M et al conducted a review of literature to identify the prosthetic complications associated with the different attachment mechanisms used for implant-supported or implant-retained overdentures. A search of the MEDLINE and PubMed databases was conducted to find articles in English and German peer-reviewed journals published between 1980 and 2008. The search focused on randomized controlled clinical trials and prospective studies with follow-up periods of at least 5 years that contained clinical data regarding success, failure, and prosthetic complications. The search yielded a limited number of randomized controlled clinical trials referring to implant-supported or implant-retained overdentures. Very few studies have prospectively compared prosthetic complications for a period longer than 5 years after delivery of the prosthesis. The authors concluded that implant-supported or implant-retained overdentures in the mandible provide predictable results with improved stability, retention, and patient satisfaction. Scientific evidence shows a

lower rate of implant survival and a higher frequency of prosthetic complications for maxillary implant-retained or implant-supported overdentures. Although the literature presents considerable information on complications of implant prostheses, variations in study design preclude proper analysis of certain complications. Well-designed longitudinal studies are required to establish evidence-based treatment planning principles. Sun X et al evaluated masticatory efficiency (ME) and oral health-related quality of life (OHRQoL) in patients rehabilitated with implant-retained mandibular overdentures. In this randomized controlled clinical trial, 50 edentulous patients visiting the Implant Center and Department of Prosthodontics, West China College of Stomatology, Sichuan University, Chengdu, China between June 2010 and June 2012 were selected and received 2 implant-retained mandibular overdenture treatments. All patients were rehabilitated with maxillary complete dentures. The ME and OHRQoL were determined both one month before the mandibular complete denture was anchored to the osseointegrated implants, and 6 months after anchoring. The ME increased from pre- to post-implant retained mandibular overdentures significantly. The total OHIP score and 4 subscales scores were changed significantly from pre- to post-implant; namely, functional limitation, psychological discomfort, physical disability, and physical pain. The total OHIP score, functional limitation, physical disability, and physical pain subscale scores were related to ME. It was concluded that implant-retained mandibular overdentures can significantly improve patients' ME and OHRQoL. The improvement in OHRQoL is mainly because of the improved ME. An improved chewing experience, and pain relief also contributes to improvement of OHRQoL.^{7,8}

Fernandez-Estevan L et al conducted study aimed to confirm if implant-supported overdentures are a good treatment option for edentulous patients and offer an improvement in quality of life compared with traditional complete prostheses (dentures). This retrospective clinical descriptive study included three evaluation groups: validation group (n=57); control group of patients with complete removable prostheses (n=56); study group of patients with implant-supported overdentures retained with the Locator® system

(n=80). The OHIP-20 proved to be a valid instrument and provided reliable assessment of health-related quality of life among both the Spanish general population and edentulous patients. The control and study groups proved comparable, showing socio-demographic homogeneity. For patients with overdentures retained by means of the Locator® system, these restorations had significantly lower impact on quality of life (19 vs 33), both generally and for each individual questionnaire item, and much higher satisfaction with the state of their oral cavities (8.3 vs 5.3) than patients wearing dentures; both sets of data showed a direct linear relationship, so that as the level of impact on quality of life increased, perceived oral satisfaction worsened. The authors concluded that patients rehabilitated with implant supported overdentures retained by the Locator® system, presented significantly lower levels of impact on their quality of life and significantly higher oral satisfaction than patients with conventional complete prostheses. Yunus N et al assessed the oral health-related quality of life (OHRQoL) of patients provided with mandibular implant fixed partial prostheses (IFPP) for rehabilitation of two adjacent missing posterior teeth and complete denture patients provided with mandibular implant-supported overdenture (ISOD). The response to change in OHRQoL with implant prostheses was additionally compared. In this prospective study, 20 IFPP and 28 ISOD patients received 2 mandibular implants. Metal ceramic nonsplinted fixed prostheses were provided in IFPP group, while in ISOD group, the mandibular overdentures were retained by nonsplinted attachments. Patients rated their oral health-related quality of life using OHIP-14 Malaysian version at baseline (T0), 2-3 months (T1) and 1 year (T2) postimplant treatment. The total OHIP and domain scores before implant treatment were significantly higher (lower OHRQoL) in IFPP than in ISOD groups, except for physical pain where this domain showed similar impact in both groups. Postimplant scores between groups at T1 and T2 showed no significant difference. The mean score changes at T0-T1 and T0-T2 for total OHIP-14 and domains were significantly greater in IFPP except in the domains of physical pain and disability which showed no difference. Large effect size (ES) was observed for total OHIP-14 in IFPP while moderate in ISOD. Improved OHRQoL was dependent on the

treatment group and pretreatment score. The authors concluded that improvement in OHRQoL occurred following both mandibular implant-supported overdentures and implant fixed partial prostheses.^{9,10}

CONCLUSION

From the results of present study we conclude that the most common prosthetic complication experienced by patients having implant supported overdenture was denture fracture followed by artificial tooth fracture.

CONFLICT OF INTEREST

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

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