

ORIGINAL ARTICLE

CLINICAL EVALUATION OF PROSTHETIC COMPLICATIONS IN PATIENTS TREATED WITH IMPLANT SUPPORTED OVER-DENTURE

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ABSTRACT:

Background: The use of implants to treat edentulous jaws has become a well-established and accepted contemporary clinical method. Interest in the use of implants for fully or partially edentulous patients has increased. **Aim:** To evaluate the prosthetic complications experienced by implant supported over-denture patients. **Materials and method:** The present study was conducted in the department of prosthodontics of the dental institution. For the study, selection of edentulous patients rehabilitated using implant denture by the department was done. A total of 29 patients with 40 dentures participated in the study, of which 23 were mandibular and 17 were maxillary. 15 patients out of 40 were males and 14 patients were females. The mean age of the patients was 66.32 years, ranging from 48- 88 years. **Results:** A total of 29 patients participated in the study. 40 implant supported dentures, 23 mandibular and 17 maxillary were given to these patients. Maximum no of patients were observed in age-group of 70-79 years. Based on sex of patients, 15 were males and 14 were females. The results were statistically significant with p value less than 0.05. The most common complication observed was denture fracture in fully edentulous dentures, followed by artificial tooth fracture. **Conclusion:** Fewer complications are observed by patients with partially edentulous patients. Also, most common prosthetic complication observed was denture fracture followed by artificial tooth fracture.

Keywords: Denture, implant, overdenture.

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INTRODUCTION:

Complete denture retention and stability can influence a patient's ability to function and are intimately and directly related to patient confidence and comfort. A logical consequence of adequate denture retention is less functional movement and better stability. ¹ Furthermore, it has been demonstrated that patients whose dentures lack stability, particularly with the mandibular prosthesis, benefit significantly from even slight increases in denture retention. ² When conventional complete denture therapy and sound prosthodontic principles result in inadequate denture retention and stability, patient satisfaction, confidence, and comfort commonly suffer. The use of implants to treat edentulous jaws has become a well-established and accepted contemporary clinical method. ³ Interest in the use of implants for fully or partially edentulous patients has increased. The retention and stability of complete denture can influence a patient's ability to function and are directly

related to patient's confidence and comfort. ⁴ However, it is difficult to achieve optimal denture retention and stability with severely resorbed mandibular ridge. ⁵ Thus, the overdenture assisted by osseointegrated implant is an attractive treatment because of its relative simplicity, minimal invasiveness, and economic feasibility. ⁶ Hence, the present study was planned to evaluate the prosthetic complications experienced by implant supported overdenture patients.

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 29 patients with 40 dentures participated in the study, of which 23 were mandibular and 17 were maxillary. 15 patients out of 40 were males and 14 patients were females. The mean age of the patients was 66.32 years, ranging from 48- 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 29 patients participated in the study. 40 implant supported dentures, 23 mandibular and 17 maxillary were given to these patients. **Table 1** shows the frequency of patients in different sex and age-groups. Maximum no of patients were observed in age-group of 70-79 years. Based on sex of patients, 15 were males and 14 were females (**Fig 1**). The results were statistically significant with p value less than 0.05.

Table 2 shows the prosthetic complications experienced in partially edentulous (n=9) and fully edentulous (n=31) 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, denture fracture and artificial tooth fracture was observed (**Fig 2**). The results were found to be statistically significant for denture fracture and artificial tooth fracture (p>0.05).

Table 1: Frequency of patients in different sex and age group

VARIABLES	No. of patients	p-value
AGE (years)	50-59	0.001
	60-69	
	70-79	
	80-89	
SEX	Male	0.02
	Female	

Figure 1: Showing frequency of patients in different Age group and sex

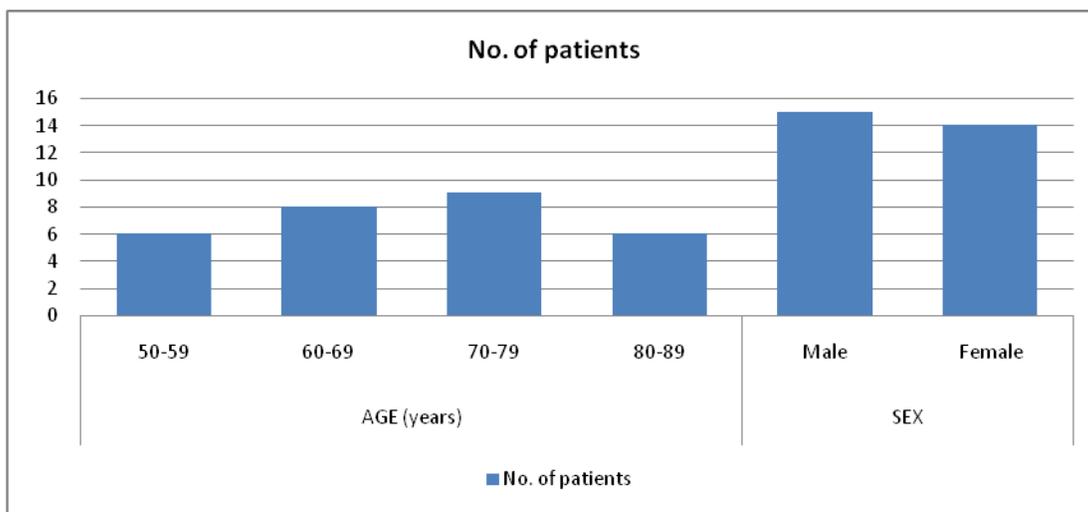
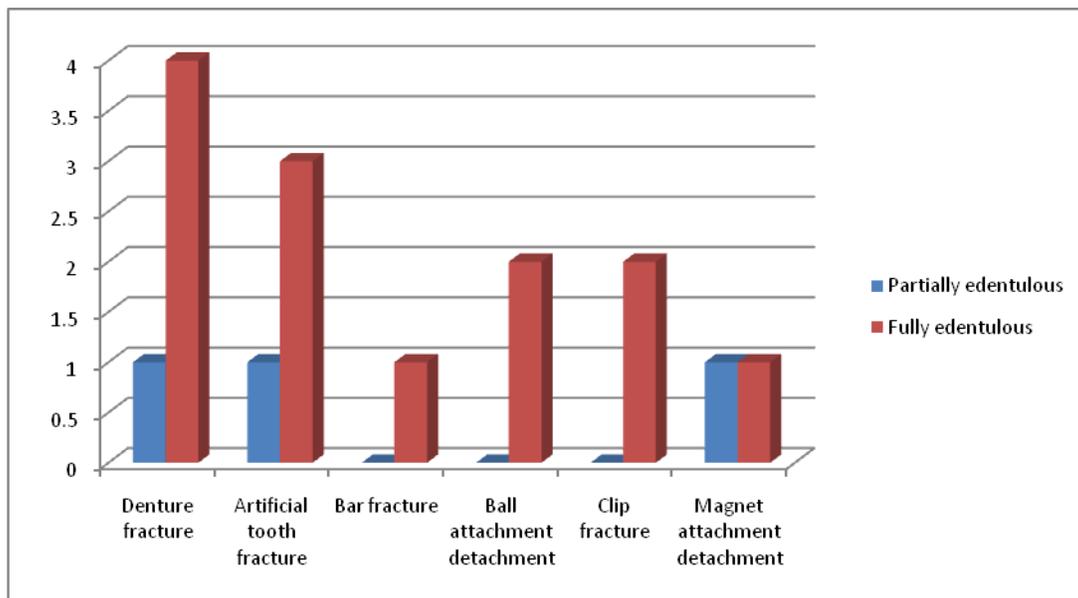


Table 2: Prosthetic complications experienced in partially and fully edentulous patients

Prosthetic complications	Partially edentulous (9 cases)	Fully edentulous (31 cases)	p-value
Denture fracture	1	4	0.002
Artificial tooth fracture	1	3	0.03
Bar fracture	0	1	0.12
Ball attachment detachment	0	2	0.23
Clip fracture	0	2	0.31
Magnet attachment detachment	1	1	0.21

Figure 2: 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, 29 patients having 40 implant supported dentures participated. The number of partially edentulous dentures was 9 and completely edentulous was 31. 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. Naert I et al compared the prosthetic aspects and patient satisfaction with prosthetic care in two-implant-retained mandibular overdentures, whether implants were splinted with a bar or left with magnets or ball attachments. Thirty-six completely edentulous patients had two Brånemark implants placed in the mandibular canine area. A randomized procedure allocated patients into three groups of equal size, each with a different attachment system: bars, magnets, or balls. Prosthesis retention and mechanical as well as soft tissue complications were recorded in addition to patient satisfaction. A linear mixed model was fitted with attachment type and time as classification variables and adjusted by Turkey's multiple range test. Ball-retained overdentures showed at year 10 the greatest vertical retention force, followed by bars and magnets. In the ball group, need for tightening of abutment screws was the most common mechanical complication; in the magnet and bar groups, respectively, the most common complications were wear and corrosion, and the need for clip activation. Prosthesis stability and chewing comfort for the overdenture were rated significantly lower for the magnet group compared to the ball and bar groups. Prosthesis stability of the maxillary denture was rated significantly lower in the

bar group compared to ball and magnet groups. Conclusion: The ball group scored best in relation to retention of the overdenture, soft tissue complications, and patient satisfaction at year 10. The bar group scored lower for comfort and stability of the maxillary denture. Magnets offered patients the least comfort. Naert I et al evaluated prosthetic outcome and patient satisfaction in order to investigate whether there is a need or advantage to splint two implants in the mandible retaining a hinging overdenture. This study included 36 fully edentulous patients randomly divided into three groups according to the attachment system they received: magnets, ball attachments or straight bars (reference group). None of the implants failed during the whole observation period in any of the groups. After 5 years of observation, the Bar group presented the highest retention capacity and the least prosthetic complications but revealed more mucositis and gingival hyperplasia. Patient satisfaction rated similar for all groups although the Magnet group showed lower retention forces. All patients would repeat the same treatment even though the majority of the Magnet group would prefer a more retentive solution because of limited denture stability.^{7,8} Merickske-Stern et al reported the results of using osseointegrated titanium implants as abutments for overdenture restorations in the mandibles of 62 edentulous patients. All of these patients were edentulous for several years and required complete dentures. Six months after prosthodontic treatment, two implants (ITI, Straumann) were placed with consideration of the denture base and morphologic aspects of the mandibular residual ridge. The retention devices consisted of a bar connector or single ball-shaped precision attachments. Three or four implants

splinted with a bar were placed in a control group of 11 patients. Attached keratinized gingiva (≥ 22 mm) surrounded approximately 48% of the buccal and 55% of the lingual implant sites. Evaluation after periods of 6 to 66 months postoperatively revealed good clinical results with five patients lost to recall in 1989. Two implants were lost after overdenture insertion. The findings suggest that two implants may adequately serve as retention for a mandibular complete denture and that attached gingiva surrounding the implants does not seem to be prerequisite for healthy function. Burns DR et al evaluated seventeen subjects with preexisting conventional complete dentures in this prospective clinical study. Two implants were placed bilaterally in the anterior mandible. In a crossover experimental design, the conventional dentures were modified, and the retention, stability, and tissue response for conventional dentures were compared with implant overdentures that had O-ring and magnet overdenture attachments for all subjects. The study indicated statistical superiority of the implant overdenture to the conventional denture. The O-ring attachment proved significantly better than the magnet attachment for retention and stability. The soft tissue response showed a slight but significant improvement with implant overdenture therapy.^{9,10}

CONCLUSION:

From the results of present study we conclude that fewer complications are observed by patients with partially edentulous patients. Also, most common prosthetic complication observed was denture fracture followed by artificial tooth fracture.

REFERENCES:

1. Parel SM. Implants and overdentures: the osseointegrated approach with conventional and compromised applications. *Int J Oral Maxillofac Implants* 1986;1:93-9.
2. Tarbet W J, Boone M, Schmidt NF. Effect of a denture adhesive on complete denture dislodgement during mastication. *J PROSTHET DENT* 1980;44:374-8.
3. Blomberg S, Linquist LW. Psychological reactions to edentulousness and treatment with jawbone-anchored bridges. *Acta Psychiatr Scand* 1983;68:251-62.
4. Esposito M, Hirsch J-M, Lekholm U, Thomsen P. Biological factors contributing to failures of osseointegrated oral implants. (1) Success criteria and epidemiology. *Eur J Oral Sci* 1998;106:527-51.
5. Melas F, Marcenes W, Wright PS. Oral health impact on daily performance in patients with implant-stabilized overdentures and patients with conventional complete dentures. *Int J Oral Maxillofac Implants* 2001;16:700-12.
6. Awad MA, Lund JP, Shapiro SH. Oral health status and treatment satisfaction with mandibular implant overdentures and conventional dentures: a randomized clinical trial in a senior population. *Int J Prosthodont* 2003;16:390-6.
7. Naert I; Ghada A; Marc Q. Prosthetic Aspects and Patient Satisfaction with Two-Implant-Retained Mandibular Overdentures: A 10-Year Randomized Clinical Study. *International Journal of Prosthodontics* . Jul/Aug2004, Vol. 17 Issue 4, p401-410. 10p. 8 Charts, 2 Graphs.
8. Naert I, Gizani S, Vuylsteke M, Steenberghe D. A 5-year prospective randomized clinical trial on the influence of splinted and unsplinted oral implants retaining a mandibular overdenture: prosthetic aspects and patient satisfaction. *Journal of Oral Rehabilitation*, Volume 26, Issue 3, March 1999, Pages 195-202.
9. Merickske-Stern, Regina. Clinical Evaluation of Overdenture Restorations Supported by Osseointegrated Titanium Implants: A Retrospective Study. *International Journal of Oral & Maxillofacial Implants* . Winter1990, Vol. 5 Issue 4, p70-87. 18p. 5 Color Photographs, 3 Black and White Photographs, 8 Charts.
10. Burns DR, Unger JW, ElswickJr.RK. Prospective clinical evaluation of mandibular implant overdentures: Part I—retention, stability, and tissue response .*The Journal of Prosthetic Dentistry*, Volume 73, Issue 4, April 1995, Pages 354-363

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