

Original Article

Cross-Sectional Assessment of Patients Satisfaction in Implant Supported Prostheses with Ball and Bar Clip Attachments: An Original Study

¹Amrita Pritam, ²Nivedita Mall, ³Anshika Agarwal, ⁴Shivanshu

^{1,2,3,4}Post Graduate Student, Department of Prosthodontics, Shree Bankey Bihari Dental College and Research Centre, Ghaziabad, India

ABSTRACT

Aim: This study was conducted to estimate the levels of patient satisfaction in completely edentulous patients those rehabilitated by implant supported prostheses with ball and bar clip. **Materials & Methods:** A questionnaire-based survey was completed on 10 patients for those who were rehabilitated by implant supported prostheses with ball and bar clip strategy. Complete dentures were fabricated by conventional method and later on converted into implant supported prostheses with ball and bar clip. In first 5 patients bar attachments were placed while in other 5 patients ball attachment were placed. A preformed questionnaire containing 7 questions about satisfaction and quality of post treatment life was distributed among patients in their follow up visits. This study comprised of patients who truthfully responded to this questionnaire. Response was recorded and data was processed statistically to evaluate satisfaction levels. **Results:** Statistical evaluation using statistical software Statistical Package for the Social Sciences (SPSS). The resultant data was subjected to suitable statistical tests to draw concrete inferences. Outcomes in the questionnaire were very significant. 4 patients were satisfied with the ball supported prosthesis. 9 patients were satisfied with the phonetics and esthetics of bar/ball supported prosthesis. 10 patients satisfied with the chewing efficiency and retention of bar/ball supported prosthesis. 8 patients think that bar/ball supported prosthesis are exceptionally comfortable when compared to conventional CD. **Conclusion:** In the studied patients, the relative level of satisfaction regarding implant supported prostheses with ball was approximately fair. However, the measured satisfaction was literally superior in cases of implant supported prostheses with bar clip. This shows the relative importance of bar clip supported prostheses over ball supported prostheses.

Key words: Implantology, Ball and Bar Clip, Satisfaction, Questionnaire, Prostheses

Received: 22 March 2018

Revised: 16 May 2018

Accepted: 26 June 2018

Correspondence to: Dr. Amrita Pritam, Post Graduate Student, Department of Prosthodontics, Shree Bankey Bihari Dental College and Research Centre, Ghaziabad, India

This article may be cited as: Pritam A, Mall N, Agarwal A, Shivanshu. Cross-sectional assessment of patients satisfaction in implant supported prostheses with ball and bar clip attachments: an original study. J Adv Med Dent Scie Res 2018;6(8):104-108.

INTRODUCTION

As we are well aware that teeth loss is not an uncommon experience. Loss of teeth usually negatively affect the overall masticatory system however, it is of transient type. Soon after the healing and restoration of the missing teeth, it's restored back to normal condition.¹ Any successful rehabilitation of lost tooth must be addressed to govern related biomechanical problems, tolerances, and perceptions. Implant-supported overdenture with two implants placed in the inter foramina region is a predictable treatment option in edentulous mandible rather than conventional complete denture as it offers increased stability, comfort, and patient compliance.² Literature has

well evidenced that success in conventional complete dentures is still an unanswered question. Different authors have differing opinion regarding it.³⁻⁶ As we have noticed in many cases, patients and prosthodontist often disagree on a successful denture experience. It is therefore, the criteria for quality standards in denture fabrication must have been scrutinized thoroughly. Conventional complete dentures are still the treatment of choice in developing countries of South East Asia. Literature have shown many researches that evaluated the factors that can affect patients' satisfaction with their complete dentures, such as denture technical quality, condition of the residual ridges, and patients' gender, age, previous denture experience, and personality.⁷⁻⁸

In this modern era, the efficient replacement of lost natural teeth by osseointegrated implants has literally revolutionized treatment options in the field of prosthodontics. The prosthetic options may be removable or fixed implant-supported/retained overdenture. In the recent past the attachment systems have also gained much popularity in terms of increasing patient’s comfort and ease. These attachment systems generally offer resistance to movement of the implant prosthesis and help in dissipating the functional load. Various retention mechanism like bar and clips, ball, locater, magnets, and precision attachments have been used with implant-supported prosthesis. This actually led to the actual need of the study. Therefore, authors have planned to conduct this study to estimate the levels of patient satisfaction in completely edentulous patients those rehabilitated by implant supported prostheses with ball and bar clip. Here authors have rationally attempted to investigate the existing outcomes by analyzing patient’s responses produced by pre-formed questionnaire.

MATERIALS & METHODS

A questionnaire-based survey was completed on 10 patients for those who were rehabilitated by implant supported prostheses with ball and bar clip strategy. Out of 10 patients, 5 were male and 5 were females. The inclusion criteria were edentulous patients in whom implants could be placed bilaterally. The ultimate selection was based on clinical and radiographic examination. We ensured to select the patients who were nonsmokers, free from any systemic disease, non-bruxers, with sufficient quality and quantity of bone. The feasibility of post treatment recall visits were also estimated and confirmed. Conventional completed dentures were fabricated for all selected patients. Implant placement was done approximately 3 months after the delivery of complete dentures. The implant system used in this study was Adin (ADIN Dental Implant Systems Ltd). A total of 20 implants (in 10 patients) were placed (two implants per patient). Later on the complete dentures were converted into implant supported prostheses with ball and bar clip attachments. In first 5 patients bar attachments were placed while in other 5 patients ball attachment were placed. For bar/ball attachments, patients were selected by randomized selection trials. A preformed questionnaire containing 7 questions about satisfaction and quality of post treatment life was distributed among patients in their follow up visits. This study comprised of patients who truthfully responded to this questionnaire. The methodology and planned way of study’s execution were explained to the patients. All were

also informed about the significance and clinical relevance of the study. Written consents were obtained from all 10 willing patients. We have decided to complete the study using questionnaire for the reason that questionnaire based studies are extremely useful to obtain comprehensive data about personal and group perceptions and opinions. Furthermore, they can be performed simultaneously on a larger population to finalize their common opinion. The secrecy and other rights of the participants were completely ensured. Results thus obtained were tabulated and subjected to statistical analysis using chi- square test. The recorded data was also subjected to basic statistical tests to attain p values and other inferences. P values less than 0.05 was considered significant (P<0.05).

STATISTICAL ANALYSIS AND RESULTS

All the studied observations and data were gathered and sent for statistical analysis using statistical software Statistical Package for the Social Sciences version 21 (IBM Inc., Armonk, New York, USA). The resultant data was subjected to relevant statistical tests to obtain p values and other inferences like Pearson Chi Square values. Table 1 and Graph 1 shows that patients were divided into 4 age groups of 50-55 years, 56-60 years, 61-65 years, >65 years, respectively. Maximum 4 patients were belonging to the age group of 56-60 years. Total 2 male and 2 female patents were there in this group [40 % of total subjects]. P value was significant (p<0.05 significant). Table 2 shows that 5 patients were satisfied with the bar supported prosthesis. 4 patients were satisfied with the ball supported prosthesis. 9 patients were satisfied with the phonetics and esthetics of bar/ball supported prosthesis. 10 patients satisfied with the chewing efficiency and retention of bar/ball supported prosthesis. A high degree of significance (p<0.05 significant) was seen in responses of this questions. 8 patients think that bar/ball supported prosthesis are exceptionally comfortable when compared to conventional CD. 10 patients think that cost must be lowered down so as to cater economically weak population. A high degree of significance (p<0.05 significant) was seen in responses of this questions. Only 4 patients were ready to advice their friends, relatives for bar/ball supported prosthesis. Table 3 shows two-sample t-test and standard deviation [sd] evaluation by analyzing general questions on ball and bar prosthesis after treatment.

Table 1: PATIENTS DEMOGRAPHICS [AGE & GENDER ASSESSMENTS]

Age Group	Year Range	Male	Female	Total	P value
1	50-55	1	1	2 [20 %]	0.070
2	56-60	2	2	4 [40 %]	0.010*
3	61-65	1	1	2 [20 %]	0.900
4	>65	1	1	2 [20 %]	0.080
Total	-	5	5	100	*Significant

*p<0.05 Significant

Graph 1: GRAPHICAL REPRESENTATION OF PATIENTS ACCORDING TO AGE & GENDER

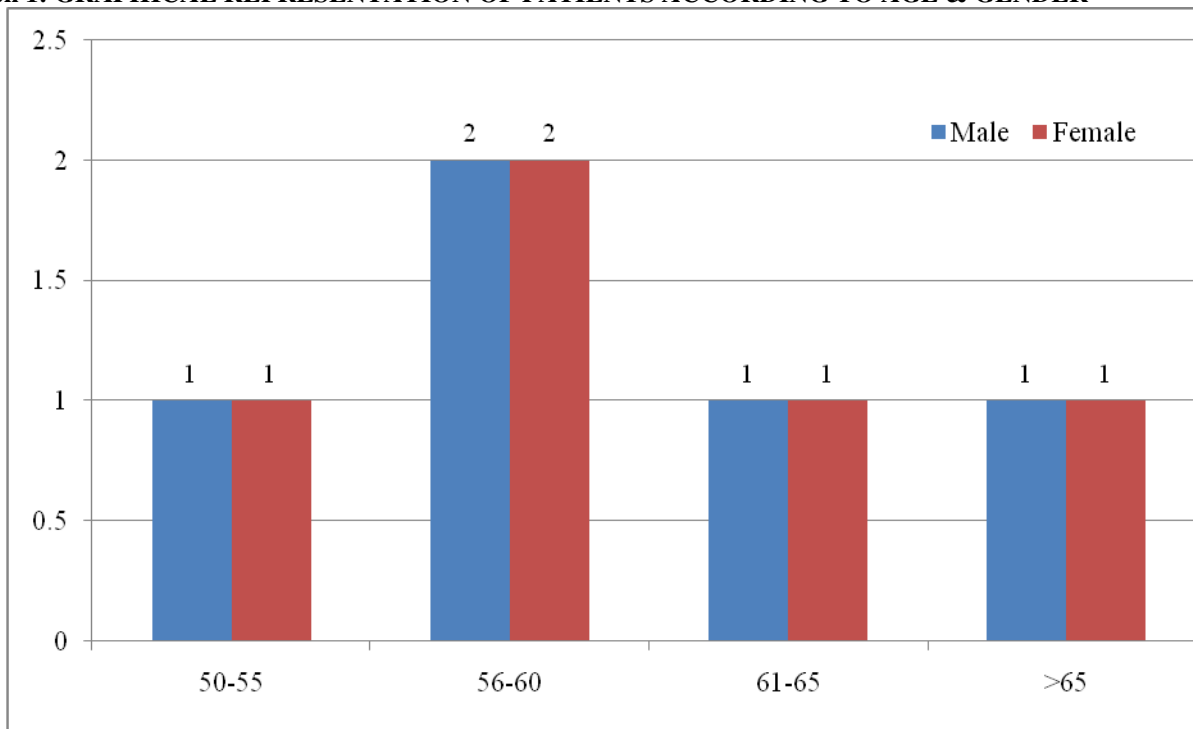


Table 2: ASSESSMENT OF QUESTIONNAIRE RESPONSES WITH RELATED STATISTICAL INFERENCES

Questionnaire	Variables	No. of Respondents	Chi Square Test (Pearson χ^2)	P value
1	Are you satisfied with the bar supported prosthesis? [n=5]	Yes = 5 No = 0	0.01	0.12
2	Are you satisfied with the ball supported prosthesis? [n=5]	Yes = 4 No = 1	0.96	0.98
3	Are you satisfied with the phonetics and esthetics of bar/ball supported prosthesis? [n=10]	Yes = 9 No = 1	0.02	0.36
4	Are you satisfied with the chewing efficiency and retention of bar/ball supported prosthesis? [n=10]	Yes = 10 No = 0	0.55	0.02*
5	Do you think that bar/ball supported prosthesis are exceptionally comfortable when compared to conventional CD ? [n=10]	Yes = 8 No = 2	0.28	0.07
6	Do you think that cost must be lowered down so as to cater economically weak population ? [n=10]	Yes = 10 No = 0	0.11	0.00*
7	Would you like to advice your friends, relatives for bar/ball supported prosthesis ? [n=10]	Yes = 4 No = 6	0.58	0.07

*p<0.05 Significant

Table 3: TWO-SAMPLE T-TEST AND STANDARD DEVIATION [SD] EVALUATION: GENERAL QUESTIONS ON BALL AND BAR PROSTHESIS AFTER TREATMENT

VARIABLES	N	MEAN	STANDARD DEVIATION [SD]	STD. ERROR [SE]
Questions on bar (after treatment)	5	2.225	0.341	0.120
Questions on ball (after treatment)	5	2.237	0.393	0.100

DISCUSSION

This study was conducted to estimate the levels of patient satisfaction in completely edentulous patients those rehabilitated by implant supported prostheses with ball and bar clip. We studied total 10 patients and mostly of them were from nearby rural areas. The McGill University (Canada) consensus statement on overdentures, issued in 2002, recommends mandibular 2-implant overdentures as first choice standard of care for edentulous patients.⁹ In recent years, high levels of satisfaction have been reported in patients wearing implant-retained overdentures.¹⁰⁻¹¹ The goals of overdenture attachment for implant reconstructed edentulous mandibles are to maximize stability and retention of the overdenture and provide shared support of the implants longitudinally, extending their longevity.¹²⁻¹³ Sufficient scientific literature supports the claim that implant-supported overdenture effectively rehabilitates completely edentulous patients with improved retention, stability, patient satisfaction, and masticatory capacity, but conventional complete denture is still widely used for the same. Immediate loading protocol is equally effective as early and delayed loading protocols.¹⁴⁻¹⁶ Numerous studies regarding the immediate loading of splinted implants retaining/ supporting mandibular dentures have reported promising results, but studies comparing splinted and unsplinted attachments for supporting overdentures with immediate loading are limited. The attachment system should be simple, predictable, cost-effective, and satisfying to the patient.¹⁷⁻¹⁸ Many types of attachments have been used for implant overdentures. These include magnets, ball-O-rings, and clips and bars. The overdenture prosthesis must be carefully designed, according to the requirements, to ensure adequate stability and optimum form, contour, esthetics, and patient comfort. Clinical and technical aspects should be considered at the beginning of treatment.¹⁹ Although the system initially requires higher cost and some additional chair time, post-delivery visits, in our experience, involve little need for adjustments and rarely have maintenance problems.²⁰ In our study, the patients were much more satisfied with the implant supported prosthesis [with bar/ball] than with the previous conventional complete dentures. Patients who received implant supported prosthesis [with bar/ball] expressed a high degree of satisfaction, both overall and for all indicators (aesthetics, speech, mastication).

CONCLUSION

Our study results unquestionably showed the present status of satisfaction regarding implant supported prosthesis [with bar/ball] in studied patients. Overall, the relative level of satisfaction regarding implant supported prostheses with ball was approximately fair. However, the measured satisfaction was literally superior in cases of implant supported prostheses with bar clip. This shows the relative importance of bar clip supported prostheses over ball supported prostheses. Nevertheless, we anticipate some

other large scale studies to be conducted that could further establish certain concrete guidelines in these perspectives.

REFERENCES

1. Prosthetic treatment time and satisfaction of edentulous patients treated with conventional or implant-supported complete mandibular dentures: a case-control study (part 1). *Int J Prosthodont* 2008;21:489-95.
2. Esfandiari S, Lund JP, Penrod JR, Savard A, Thomason JM, Feine JS. Implant overdentures for edentulous elders: study of patient preference. *Gerodontology* 2009;26:3-10.
3. Hobkirk JA, Abdel-Latif HH, Howlett J, Welfare R, Moles DR. Prosthetic treatment time and satisfaction of edentulous patients treated with conventional or implant-stabilized complete mandibular dentures: a case-control study (part 2). *Int J Prosthodont* 2009;22:13-9.
4. Assunção WG, Zardo GG, Delben JA, Barão VA. Comparing the efficacy of mandibular implant-retained overdentures and conventional dentures among elderly edentulous patients: satisfaction and quality of life. *Gerodontology* 2007;24:235-8.
5. Goodacre CJ, Kan JY, Rungcharassaeng K. Clinical complications of osseointegrated implants. *J Prosthet Dent* 1999;81(5):537-52.
6. Van Kampen FM, van der Bilt A, Cune MS, Bosman F. The influence of various attachment types in mandibular implant-retained overdentures on maximum bite force and EMG. *J Dent Res* 2002;81(3):170-3.
7. Visser A, Raghoobar GM, Meijer HJ, Batenburg RH, Vissink A. Mandibular overdentures supported by two or four endosseous implants. A 5 year prospective study. *Clin Oral Implants Res* 2005;16(1):19-25.
8. Zitzmann NU, Marinello CP. Treatment outcomes of fixed or removable implant-supported prostheses in the edentulous maxilla. Part I: patients assessments. *J Prosthet Dent* 2000;83:424-33.
9. The McGill consensus statement on overdentures. *Quintessence Int* 2003;34:78-9.
10. Timmerman R, Stoker GT, Wismeijer D, Oosterveld P, Vermeeren JJ, Waas MA. An eight-year follow-up to a randomized clinical trial of participant satisfaction with three types of mandibular implant-retained overdentures. *J Dent Res* 2004;83:630-3.
11. Bergendal T, Engquist B. Implant-supported overdentures: a longitudinal prospective study. *Int J Oral Maxillofac Implants* 1998;13:253-62.
12. Visser A, Raghoobar GM, Meijer HJ, Batenburg RH, Vissink A. Mandibular overdentures supported by two or four endosseous implants. A 5-year prospective study. *Clin Oral Implants Res* 2005;16:19-25.
13. Cehreli MC, Karasoy D, Akca K, Eckert SE. Meta-analysis of methods to assess implant stability. *Int J Oral Maxillofac Implants* 2009;24(6):1015-32.
14. Feine JS, Carlsson GE, Awad MA, Chehade A, Duncan WJ, Gizani S, Head T, Lund JP, MacEntee M, Mericske-Stern R, et al. The McGill consensus statement on overdentures. Mandibular two-implant overdentures as the first treatment choice for edentulous patients. *Gerodontology* 2002;19(1):3-4.
15. Kronstrom M, Davis B, Loney R, Gerrow J, Hollender L. A prospective randomized study on the immediate loading of mandibular overdentures supported by one or two implants: 12 month follow up report. *Int J Oral Maxillofac Implants* 2010;25(1):181-8.

16. Liao KY, Kan JY, Rungcharassaeng K, Lozada JL, Herford AS, Goodacre CJ. Immediate loading of two free standing implants retaining a mandibular overdenture: one year pilot prospective study. *Int J Oral Maxillofac Implants* 2010;25(4):784-90.
17. Walton JN, MacEntee MI, Glick N. One-year prosthetic outcomes with implant overdentures: a randomized clinical trial. *Int J Oral Maxillofac Implants* 2002;17:391-8.
18. MacEntee MI, Walton JN, Glick N. A clinical trial of patient satisfaction and prosthodontic needs with ball and bar attachments for implant-retained complete overdentures: three-year results. *J Prosthet Dent* 2005;93:28-37.
19. Heydecke G, Thomason JM, Lund JP, Feine JS. The impact of conventional and implant supported prostheses on social and sexual activities in edentulous adults Results from a randomized trial 2 months after treatment. *J Dent* 2005;33:649-57.
20. Krennmair G, Krainhöfner M, Piehslinger E. Implant-supported mandibular overdentures retained with a milled bar: a retrospective study. *Int J Oral Maxillofac Implants* 2007;22:987-94.

Source of support: Nil

Conflict of interest: None declared

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