Research Article

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An All-Inclusive Retrospective Assessment of Different Complications Related with Implant Supported Over-Dentures: An Original Research Study

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ABSTRACT

Background: In the recent past, implant-supported or retailed over-dentures have become the popular therapy for ultimate rehabilitation of completely edentulous jaws. However, complications related to these prostheses have also been reported dramatically. The exclusive aim of this retrospective study was to assess the different complications related to implant-supported or retained mandibular over-dentures in the studied patients.

Materials & Methods: The philosophy and conception of this study were based on retrospective ideology. At first, 15 males and ten female patients were selected for record and data exploration related to the implant over-denture. Factors those studied group I were peri-implantitis, mucosal enlargement, Hygiene dilemma, peri-implant mucositis, implant loss. Similarly, factors those studied group II were over-denture fracture, attachment fractures and retention loss in the attachments, bar fracture, ball attachment detachment, clip fracture, denture material issues. Results thus obtained was filled in the table and subjected to basic statistical analysis.

Results: Statistical analysis was done by statistical software Statistical Package for the Social Sciences (SPSS). The recorded data were subjected to appropriate statistical tests to obtain p values, mean, standard deviation, standard error an 95% CI. $P \leq 0.05$ was considered as statistically significant. Maximum [9] patients were falling in the age range of 46-50 years. P-value was found to be significant. Group, I showed that a total of 7 cases was having the complication of peri-implantitis. P-value was found to be significant. In 4 patients, implant losses were noted. P-value was found to be significant. Group II showed that a total of 2 cases were having the complication of over-denture fracture. P-value was found to be significant.

Conclusion: Peri-implantitis, peri-implant mucositis and implant losses were most commonly noted complication in more than half of the studied cases. In general, biological complications were noted in 64% of patients, whereas mechanical complications were noted in 36% of patients.

Keywords: Mucositis, Implantitis, Ball Attachment, Implant, Bar and Clip.

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INTRODUCTION

An overdenture is typically defined as 'a removable partial or complete denture that covers and rests on one or more remaining natural, teeth, roots, and/or dental implants; a prosthesis that covers and is partially supported by natural teeth, tooth roots, and/or dental implants.' This is as per Glossary of Prosthodontic Terms (GPT).[1,2] Few of the other standard sources defines implant-supported overdenture as a prosthesis that obtains its entire support from dental implants, while an implant-retained overdenture gains its support from a combination of intraoral tissues and dental implants. In the recent past, implant-supported overdentures have become the popular therapy for ultimate rehabilitation of completely edentulous jaws.[3,4,5] This prosthesis appreciably enhances the quality of life in complete denture patients those seeking for ultimate comfort and ease. Several attempts of literature search have been made regarding such prosthesis about their retention, stability, longevity, ease, chewing efficiency, complication and after cares.[6,7] However, with ever-increasing technological advancements, we must keep on updating ourselves. These practices not only improve the durability of the prosthesis but also ensure optimal patient satisfaction. While exploring the literature, many of the pioneer workers have concluded that no apparent meta-analysis was performed.[8,9] This is especially true for implant-supported over-dentures since the literature seems to be very heterogenic. According to the race, culture, economy and mythologies; patient's choices for suitable prostheses are highly varying country to country.[10,11] In highly developed countries, people more inclined towards fixed implant-supported prosthesis rather than a removable one. However, this does not stand true for developing countries of the South Asian region. Here, removable implant prosthesis is the choice of treatment for most of the people.[12-13] When we explored about relative complications of these therapies, few very crucial fact were noticed. Mostly these complications implant-supported or implant-retained overdentures were discussed under the subheadings of biological and technical (mechanical). Few of the prominent biological complications were peri-implantitis, mucosal enlargement, Hygiene dilemma, peri-implant mucositis, and implant loss. Moreover, the mechanical complication includes over-denture fracture, attachment fractures and retention loss in the attachments, bar fracture, ball attachment detachment, clip fracture, denture material related issues. The sole aim of this retrospective study was to assess the different complications related to implant-supported or retained mandibular overdentures in the studied patients.

MATERIALS & METHODS

This study was completed in the department of prosthodontics of the institute. Authors had endeavoured for retrospective assessment of different complications related to implant-supported/retained over-dentures. Authors also ensured comprehensive genuinely and transparency throughout the study. Initially, the departmental record and data related to the implant over-denture patients were gathered. The study was purely retrospective type of randomized clinical study. Patients with sufficient bone volume and with a complete edentulous mandible were included in the study. Total of 15 males and ten female patients were studied. The age of the patients was ranging from 41 years to 65 years. Patients with unrestrained systematic medical issues were excluded from the study. For obtaining written consent, selected patients were re-contacted via their communication details. Relative significances of the study were also explained to all participating patients. All implant-supported/retained over-denture patients those have been done in the last eighteen months were targeted. During the selection of the patients, no racial and sexual biases were done. As a result, data of a total of 25 patients were finalized to be used in the study. Factors those studied as biological complications [group I] were; peri-implantitis, mucosal enlargement, Hygiene dilemma, peri-implant mucositis, implant loss. Mechanical complications those studied were [group II]: over-denture fracture, attachment fractures and retention loss in the attachments, bar fracture, ball attachment detachment, clip fracture, denture material issues. We had also made sure to explore the record of postoperative follow-up visits. This was attempted to exactly locate the associated complications. Moreover, the authors ensured to select only mandibular implant-supported/retained

over-denture cases instead of maxillary implant over-denture cases. The privacy, rights and other interconnected factors of the patient's data along with their freedom of expression were reserved as absolutely confidential. Results thus obtained was filled in the table and subjected to fundamental statistical analysis. P-value less than 0.05 was considered significant (p< 0.05).

RESULTS

In this third millennium, dental implant corporations have predicted that more than three million implants are positioned each year, and this numeral will rise every twelve months. Implant therapy is now considered as a universal scheme of managing edentulous jaws by implant-supported over-dentures. In this study, all noticeable findings and data were sent for statistical analysis using statistical software Statistical Package for the Social Sciences version 21 (IBM Inc., Armonk, New York, USA). The finalized data were subjected to appropriate statistical tests to obtain p values, mean, standard deviation, chi-square test, standard error and 95% CI. Table 1 and Graph I showed that out of 25 patients, males were 15, and females were 10. All selected and studied patients were separated into six age groups. Four patients were falling in the age range of 41-45 years. 9 patients were falling in the age range of 46-50 years. Therefore we can presume that majority of the selected patients were of these age groups. P-value was found to be significant in the second age group of the age range of 46-50 years. The calculated value was 0.01. Only one patient was noticed in the last age group (more than 65 years). P-value was found to be significant in this age group. The calculated value was 0.02. Table 2, 3 and Graph 2 demonstrates basic statistical description with the level of significance evaluation using Pearson chi-square test [for Group I and II]. Group, I showed that a total of 7 cases were having the complication of peri-implantitis. P-value was found to be significant. In 4 patients, implant losses were noted. P-value was found to be significant. In 3 patients, peri-implant mucositis was observed. P-value was found to be significant. Only one case showed complication of hygiene dilemma and mucosal enlargement (each). Group II showed that a total of 2 cases were having the complication of over-denture fracture. P-value was found to be significant (0.02, p<0.05 significant). In 1 patient, attachment fractures were noted. P-value was found to be non-significant. In 1 patient, retention loss in the attachments was observed. P-value was found to be non-significant. Only one case showed complication of bar fracture, clip fracture and ball attachment detachment (each). In 2 patients, denture material issues were noted. P value was found to be non-significant.

Table 1: Age & gender wise allocation of patients.

Age Group (Yrs)	Male	Female	Total [%]	Mean	SD	P value
41-45	2	2	4 [16 %]	4.28	1.96	0.08
46-50	5	4	9 [36 %]	8.32	1.84	0.01*
51-55	3	2	5 [20 %]	5.72	1.96	0.06
56-60	2	1	3 [12 %]	1.42	1.63	0.50
61-65	2	1	3 [12 %]	1.94	1.38	0.20
>65	1	0	1 [4 %]	0.88	1.84	0.02*
Total	15	10	25 [100 %]	-	-	*Significant

***p<0.05 significant**

Table 2: Basic statistical representation with level of significance evaluation using pearson chi-square test [for group I]

Biological Complications	n =16	Std. Deviation	Std. Error	95% CI	Pearson Chi-Square Value	df	Level of Significance (p value)

Peri-implantitis	7	2.282	0.842	1.96	2.732	2.0	0.02*
Mucosal enlargement	1	0.192	0.390	1.96	2.846	1.0	0.08
Hygiene dilemma	1	0.228	0.848	1.51	2.286	1.0	0.50
Peri-implant mucositis	3	1.186	0.229	1.54	1.852	1.0	0.02*
Implant loss	4	3.138	0.134	1.96	1.462	1.0	0.01*

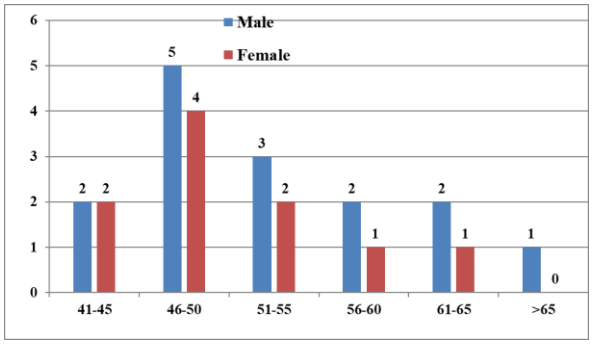
***p<0.05 significant**

Table 3: Basic statistical depiction with level of significance evaluation using pearson chi-square test [for group II].

Mechanical Complications	n =9	Std. Deviation	Std. Error	95% CI	Pearson Chi-Square Value	df	Level of Significance (p value)
Over-denture fracture [ODF]	2	0.349	0.234	1.54	1.674	1.0	0.02*
Attachment fractures [AF]	1	0.830	0.290	1.59	21.346	2.0	0.08
Retention loss in the attachments [RLA]	1	0.752	0.640	1.56	2.121	1.0	0.50
Bar fracture [BF]	1	0.789	0.832	1.86	1.245	2.0	0.92
Ball attachment detachment [BAD]	1	0.272	0.880	1.86	1.922	2.0	0.86
Clip fracture [CF]	1	0.642	0.728	1.59	2.346	2.0	0.42
Denture material issues [DM]	2	0.752	0.457	1.56	2.121	1.0	0.28

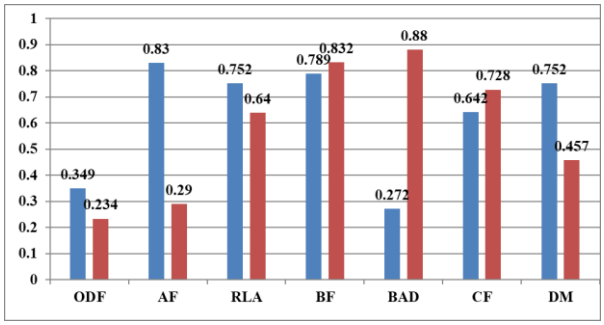
***p<0.05 significant**

Graph 1: Age & gender wise distribution of patients.



DISCUSSION

What is a successful implant? That's a very dramatic and concerning question in our mind. Literature has stated that a successful implant is an individual; an unattached implant is immobile when tested clinically. However, this does not stand true in all clinical cases for a particular age and sex. Most of the related studies have put forwarded few common key points to declare an implant a success.[14]



Graph II: Std. Deviation and std. Error for mechanical complications: [group-II]

An implant is successful when a) radiograph does not show any indication of peri-implant radiolucency b) when the vertical bone loss is less than 0.2 mm yearly following the implant's first

year of service c) when individual implant performance be characterized by an absence of persistent and/or irreversible signs and symptoms such as pain, infection, neuropathies, paresthesia, or violation of the mandibular canal.[15,16] Pioneer workers have also stated that, in the context of the above, a success rate of 85% at the end of a five year observation period and 80% at the end of a ten year period be a minimum criterion for success. However, with the changing trends of biological and technical/mechanical factors, these success criteria not appeared to be fit for all.[17,18] We have also noticed that with the ever-changing demographics of the residents in the world have made a shift in the incidences and epidemiology of edentulism. This particular shift is somewhat decreasing in western countries, including the United States. Whatever the situation may be; an edentulous patient is always in severe need of teeth. It could be completely removable with or without implants. Implant support or retained prosthesis has become more common due to its efficiency and comfort.[19,20] However they are not as economical as conventional complete dentures. With the discovery of osseointigrated implants, the relative success of fixed dentures has become a boom. It is extremely useful for completely edentulous patients those seeking for the fixed denture.[21,22,23] Literature has also shown that is may be successfully performed in partially edentulous cases also. Postoperative complications related to these therapies were mostly categorized into biological and mechanical complications. Biological complications are usually; peri-implantitis, mucosal enlargement, Hygiene dilemma, peri-implant mucositis, implant loss. Mechanical complications are common: over-denture fracture, attachment fractures and retention loss in the attachments, bar fracture, ball attachment detachment, clip fracture, denture material issues. In the present study, the authors focused on these factors only. Our study results were comparable to the inferences drawn by Ülkü and associates.[24] Dhillon and associates studied the dilemma related to the fracture of the overdenture implant base. They stated that implant over-dentures must be regularly reinforced with a metal framework to prevent denture base fracture.[25] Muftu and colleagues studied in detail about potential problems related to the use of implant-supported overdentures.[26] Their study parameters were comparable with our results. Mostly they were in accordance with our study results.

CONCLUSION

Within the limitations of the study, the authors concluded that 7 cases showed peri-implantitis, four patients showed implant losses and three patients exhibited peri-implant mucositis. Moreover, 2 cases showed an over-denture fracture also. Only in 1 patient [each] showed attachment fractures and loss retention in attachments. Complication related to bar fracture, clip fracture and ball attachment detachment was also noticed in one patient (each). Therefore peri-implantitis, peri-implant mucositis and implant losses were most commonly noted complication in more than half of the studied cases. Most interestingly, biological complications were noted in 64% of patients, whereas mechanical complications were noted in 36% of patients. Inferences of our study results should be considered as suggestive for assuming prognosis for similar clinical circumstances. However, authors expect few large-scale studies to be conducted in these regards.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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