

## ORIGINAL RESEARCH

### **An all inclusive evaluation of post surgical complication associated success in patients treated with ball and bar Supported Implant Overdentures: An Original Research Study**

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#### **ABSTRACT**

**Background & Aim:** Implant treatment is highly popular as prosthetic replacement option for various clinical situations. However, clinical implant failures are also unavoidable events which need immediate attention. This study was conducted to evaluate post surgical complication associated success/failure in patients treated with ball and bar Supported Implant Overdentures.

**Materials and Methods:** The data collected from the clinical document record archives of department for implant over-denture patients with bar and ball attachments. Total 30 patients have been selected by systematic sampling procedure. Two study groups were having 15 patients each. Group 1 patients had received bar supported implant overdentures. Group 2 patients received ball supported implant overdentures. Post operative complications have been screened in their recall periods at an interval of 3 months, 6 months and 9 months. Record of failure or success status was noted in the different time periods in recall visits. Statistical analysis was done by software and inferences were recognized accordingly.

**Statistical Analysis & Results:** Total 30 patients were included in the study with 18 male and 12 females in the age range of 45 to 65 years. For Group 1, in 3 month post operative follow up period 13 out of 15 implants were declared successful. P value was highly significant here. In 9 month post operative follow up period, 10 out of 15 implants were declared successful. For Group 2, in 3 month post operative follow up period 14 out of 15 implants were declared successful. In 6 month post operative follow up period, 13 out of 15 implants were declared successful. In 9 month post operative follow up period, 11 out of 15 implants were declared successful. One-way ANOVA

assessments for between groups, within groups and cumulative were done. P value was significant here (0.001).

**Conclusion: Authors concluded that post operative complications are apparently unavoidable in implant therapies. In our study, ball supported implant over-dentures showed slight higher success rate compared to bar supported implant over-dentures. Additionally, there was a slight increase of failure rate with the increasing follow up timings.**

**Keywords: Overdentures, Implant, Complications, Surgery, Osteotomy, Bar, Ball**

## INTRODUCTION

Implant complications are very cumbersome and irritating for clinicians since many decades. Implant complications are very frequent in past however with the increasing technologies and hygiene practices, it has been reduced to many folds. Albrektsson and associates were in the initial workers who studied the implant success and failure in details.<sup>1</sup> The most significant study was osseointegration and its relation to implant surface.<sup>2,3,5</sup> Many researchers have confirmed that post operative complications of implant over dentures are mostly because of poor maintenance and associated superadded infection and inflammation.<sup>6,8,9</sup> Such deleterious events directly affect the active osseointegration process and healing. Apart from the failures of implant surface, clinicians have also noticed several failures those related to implant-abutment connections, abutments and prosthesis.<sup>12-14</sup> Several pioneer workers have also studied in detail about dental implant complications in terms of etiology, prevention and applicable treatment.<sup>14-21</sup> Therefore, most of the post surgical problems usually end up with reduced success rate. Keeping all these intermingling points in mind, we designed to genuinely explore the success and failure of implant over-denture in their post operative follow up phases. Hence, this study was principally conducted to evaluate post surgical complication associated success/failure in patients treated with ball and bar Supported Implant Overdentures.

## MATERIALS AND METHODS

This study was planned and executed in the department of Prosthodontics of the institute on retrospective model. The data collected from the clinical document record archives of department. Implant over-denture patients in which bar and ball attachments utilized were included in the study. Total 30 patients have been screened from the record archives. Patients were selected by systematic sampling procedure to avoid any selections bias. Both male and female patients were included irrespective of their economical and social status. Patients in the age range of 45 to 65 were studied/included in the study. Only mandibular implant over-dentures were considered. Two study groups were having 15 patients each. Exclusion criteria primarily include the patients with follow up issues, patients with ongoing medications which can interfere with data quality, patients with severe/complicated ongoing systemic disorders. All rights and privacy was kept confidential. Ethical clearance was also obtained for smooth conduction of the study. Group 1 patients had received bar supported implant overdentures. Group 2 patients received ball supported implant overdentures. Post operative complications have been screened in their recall periods at an interval of 3 months, 6 months and 9 months. Study model was explained in details to all willing participants. Risk, benefits, confidentiality, compensation, timings and other details also explained to all participants. Informed consent obtained from all participants. Record of failure or success status was noted in the different time periods in recall phases. This was attempted for both of the study groups. The failure or success of the implant and associated overall prosthesis was determined by universally accepted criteria given by Albrektsson and associates.<sup>1</sup> Data was recorded and

entered into excel sheet for further processing. Statistical analysis was done by software and inferences were established accordingly.

### STATISTICAL ANALYSIS AND RESULTS

Table 1 & Graph 1 Illustrate about age & gender based allotment of patients. Total 30 patients were included in the study with 18 male and 12 females in the age range of 45 to 65 years. In the first age group of 45-50 years, total 5 patients were found. P value was highly significant for this group (0.02). In the age range of 51-55 years, total 8 patients were identified. P value was highly significant for this group (0.03). In the age range of 61-65 years, total 6 patients were found with insignificant p value (0.20). Table 2 illustrates about fundamental statistical analysis and details for success status of Group 1 (Bar supported implant overdentures). Total 15 patients were studied in this group. In 3 month post operative follow up period, 13 out of 15 implants were declared successful. P value was highly significant here. It was 0.01. In 6 month post operative follow up period, 12 out of 15 implants were declared successful. P value was not significant here. In 9 month post operative follow up period, 10 out of 15 implants were declared successful. P value was not significant here. Table 3 illustrates about fundamental statistical analysis and details for success status of Group 2 (Ball supported implant overdentures). Total 15 patients were studied in this group. In 3 month post operative follow up period, 14 out of 15 implants were declared successful. P value was highly significant here. It was 0.02. In 6 month post operative follow up period, 13 out of 15 implants were declared successful. P value was not significant here. In 9 month post operative follow up period, 11 out of 15 implants were declared successful. P value was not significant here. Table 4 shows about assessment amongst the 2 study groups using one-way ANOVA [for Group 1 & 2]. Assessments for between groups, within groups and cumulative were done. P value was significant here (0.001).

**Table 1: Age & gender based statistical details of participating patients**

Age Group (Yrs)	Male	Female	Total	P value
45-50	2	3	5	0.02*
51-55	6	2	8	0.03*
56-60	7	4	11	0.19
61-65	3	3	6	0.20
Total	18	12	30	*Significant
*p<0.05 significant				

**Table 2: Fundamental statistical analysis and details for success status of Group 1: Bar supported implant overdentures**

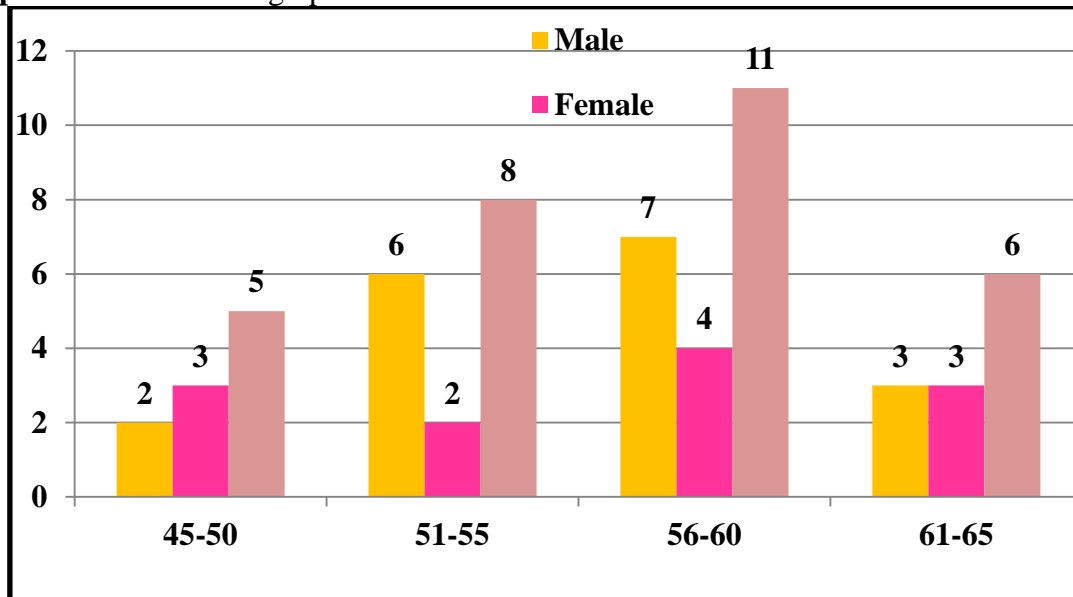
Timings	Status	N	Stat. Mean	Std. Deviation	Std. Error	95% CI	Pearson Chi-Square Value	df	P value
3 Months	Success	13	2.31	0.029	0.835	1.96	1.049	1.0	0.01*
	Failed	2	1.12	0.321	0.028	1.02	1.637	2.0	0.09
6 Months	Success	12	2.24	0.653	0.212	1.18	1.122	1.0	0.08
	Failed	3	1.73	0.202	0.709	1.52	1.373	1.0	0.82
9 Months	Success	10	2.01	0.425	0.526	1.34	1.324	2.0	0.90
	Failed	5	1.62	0.403	0.302	1.83	1.038	1.0	0.10

**Table 3: Fundamental statistical analysis and details for success status of Group 2: Ball supported implant overdentures**

Timings	Status	n	Stat. Mean	Std. Deviation	Std. Error	95% CI	Pearson Chi-Square Value	df	p value
3 Months	Success	14	2.41	0.625	0.324	1.96	1.038	1.0	0.02*
	Failed	1	1.22	0.353	0.637	1.42	1.553	2.0	0.40
6 Months	Success	13	2.34	0.674	0.203	1.02	1.176	2.0	0.60
	Failed	2	1.83	0.028	0.536	1.43	1.536	2.0	0.38
9 Months	Success	11	2.02	0.536	0.853	1.76	1.893	2.0	0.09
	Failed	4	1.68	0.453	0.302	1.83	1.422	1.0	0.08

**Table 4: Assessment amongst the 2 study groups using one-way ANOVA [for Group 1 & 2]**

Variables	Degree of Freedom	Sum of Squares $\Sigma$	Mean Sum of Squares $m\Sigma$	F	Level of Significance (p)
Between Groups	3	2.425	1.625	2.1	0.001*
Within Groups	21	5.636	0.536		-
Cumulative	163.10	12.938	*p<0.05 significant		

**Graph 1: Patient's demographic distribution and associated details**

## DISCUSSION

Albrektsson and associated put forwarded initial criteria of dental implant success in their research paper titled 'osseointegration in relation to implant surfaces'. These parameters were largely related to the crestal bone loss, implant mobility and clinical signs and symptoms of infections and pain.<sup>1</sup> Loza and colleagues have researched about success and complications of implant-retained prostheses provided by the post-doctoral prosthodontics program. This study was based on cross sectional ideology in which data was processed logically to finalize

inferences.<sup>2</sup> In fact, their study results were highly comparable to our outcomes and inferences. Waddell and coworkers had studied about Fatigue failures of bar-attachment brazed joints for implant-supported overdentures. Their results also confirmed about increasing failure rate with increasing post operative timings. These findings were in accordance with our study outcomes.<sup>4</sup> Froum also studied about dental implant complications, etiology, prevention and treatment.<sup>7</sup> Their inferences were highly imperative for assuming outcomes of similar clinical situations. Pjetursson and others have studied in detail about improvements in implant dentistry over the last decade. They have actually done comparison of survival and complication rates in older and new publications. They also find the same pattern of success and failure rates in follow up periods of implant over-denture.<sup>10</sup> These outcomes were highly comparable with our results and recommendations. Goodacre and other researchers have studied comprehensively about clinical complications with implants and implant prostheses. These results were in accordance with many of previous studies and clinical trials. However, the study populations and setup was entirely different from ours.<sup>11</sup> Ouiryinen and other researchers have studied about periodontal aspects of osseointegrated fixtures supporting an overdenture.<sup>14</sup> It was a 4 year retrospective study done with aim to assess various complications and associated success and failure rates.

## CONCLUSION

Within the limitations of the study, authors concluded that implant therapies usually pose post operative complications. All these complications are typically seen in various follow up periods. In our study, both bar and ball supported implant over-dentures showed satisfactory outcomes in their follow up phases however, ball supported implant over-dentures showed slight higher success rate compared to bar supported implant over-dentures. Interestingly, there was a slight increase of failure rate as the time progressed. This was seen clearly in both of the study groups. Outcomes of this study must be comprehensively correlated clinically. Authors also expect other long term studies to be conducted in this regards.

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