

Original Article

Assessment of outcome of dental implant therapy in different age groups- A clinico- radiographic study

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ABSTRACT:

Background: Dental implants as an effective and predictable way of replacing lost teeth. The present study was conducted to assess outcome of dental implants and teeth in different age groups clinico-radiographically. **Materials & Methods:** The present study was conducted on 40 subjects age ranged 18- 60 years of both genders. Subjects were divided into two groups of 20 each. Group I subjects were in age group 18-39 years and group II in age group 40-60 years. After implant insertion, all patients were recalled for follow up for clinical and radiographic evaluation made at the 0 (1 week after placement), 6 months and 1 year of implant placement. **Results:** It was found that mean BOP around implant and at adjacent teeth was non- significant. The mean clinically pocket depth around implant and adjacent teeth found to be significant ($P < 0.05$). The mean radiographic pocket depth around implant and at adjacent teeth was also significant ($P < 0.05$). **Conclusion:** There is considerable less pocket depth, bleeding on probing index and radiographic bone loss in young adults as compared to old patients.

Key words: Bleeding on probing, Dental, implant, Pocket depth

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INTRODUCTION

The management of partially edentulous patients range from removable partial denture, a definitive cast partial denture, a resin bonded prosthesis and fixed partial denture or osseointegrated prosthesis. Nowadays, dental implants as an effective and predictable way of replacing lost teeth and currently dental Implantology has become one of the major specialties of dentistry in terms of restoring function, esthetics and patient acceptance.¹

The choice and popularity of dental implant among dentists and patients are due to its high survival rate and less failure rates. In case of removable partial dentures, there are limitations such as loosening of adjacent teeth, trauma to soft and hard tissues with clasps etc. Similarly in case of fixed partial dentures, there is need to take support from adjacent teeth, thus may predispose it to sensitivity.²

Clinical evaluation is important to optimize maintenance, detect early signs of disease and plan corrective

interventions. Stability of peri-implant tissues is considered crucial when evaluating dental implant outcomes and it is measured by clinical and radiologic parameters. It is important to know the parameters that are directly related to implant success.³

Clinically visible mobility of an implant after an appropriate healing period indicates failure to achieve osseointegration. Mobility at follow-up is a sign of the final stage of peri-implant pathology and indicates complete failure of osseointegration. Increasing probing depth and loss of clinical attachment are pathognomonic of periodontal disease. Pocket probing is, therefore, a crucial procedure in diagnosis of the peri-implantitis and for the evaluation of its therapy. Crestal bone loss has been documented as one of the important factors that affect the long term prognosis of implant supported restoration.⁴

Evaluation by radiograph is considered as a method to measure crestal bone loss to facilitate a successful implant

treatment. A vertical marginal peri-implant bone loss of 1–1.5 mm during the first year of function followed by a yearly bone loss of 0.1–0.2 mm has been reported in a number of clinical studies.⁵ The present study was conducted to assess outcome of dental implants and teeth in different age groups clinico-radiographically.

MATERIALS & METHODS

The present study was conducted in the department of Periodontology and Implantology at Dasmesh Institute of Research & Dental Sciences, Faridkot. It comprised of 40 subjects age ranged 18- 60 years of both genders. The study protocol was approved from institutional ethical committee. After obtaining approval, all subjects were informed regarding the study and written consent was obtained.

Inclusion criteria consisted of partially dentate patients requiring dental implants, subjects with sufficient amount of bone and keratinized tissue. Exclusion criteria consisted of subjects with poor oral hygiene, uncontrolled diabetes; pregnancy or lactation.

Subjects were divided into two groups of 20 each. Group I were in age group 18-39 years and group II in age group 40-60 years. Before starting the procedure, all patients received thorough explanations and blood investigations were performed in all subjects. Soft and hard tissue evaluation was done clinically and radiographically.

Following this, a diagnostic wax-up of the tooth to be replaced were made, facilitating implant placement. All patients were pre-medicated with appropriate antibiotics and all the surgeries were performed under local anesthesia using standard surgical protocol. Postoperative instructions and medications were given to the patient. All patients were recalled for follow up for clinical and radiographic evaluation made at the 0 (1 week after placement), 6 months and 1 year of implant placement. The data was collected and analyzed using chi- square test and Mann Whitney test. The data was expressed in mean± SD. P value less than 0.05 was considered significant.

RESULTS

Table I Bleeding on probing around implant at baseline, 6 months and 1 year

Groups	Baseline		At 6 months		At 1 year		P value
	Mean	SD	Mean	SD	Mean	SD	
Group I	2.3	0.1	2.0	0.1	1.9	0.1	0.5
Group II	2.7	0.3	2.3	0.2	2.1	0.1	

Table I shows that mean± SD BOP in group I at baseline was 2.3± 0.1, at 6 months was 2.0± 0.1 and at 1 year was 1.9± 0.1. In group II, mean± SD BOP at baseline was 2.7± 0.3, at 6 months was 2.3± 0.2 and at 1 year was 2.1± 0.1. The difference found to be statistically non- significant (P> 0.05).

Table II Bleeding on probing at adjacent teeth at baseline, 3 months and 6 months

Groups	Baseline		At 6 months		At 1 year		P value
	Mean	SD	Mean	SD	Mean	SD	
Group I	2.1	0.1	1.6	0.1	1.3	0.1	0.1
Group II	2.3	0.3	1.5	0.2	1.2	0.1	

Table II shows that mean± SD BOP at adjacent teeth in group I at baseline was 2.1± 0.1, at 6 months was 1.6± 0.1 and at 1 year was 1.3± 0.1. In group II, mean± SD BOP at baseline was 2.3± 0.3, at 6 months was 1.5± 0.2 and at 1 year was 1.2± 0.1. The difference found to be statistically non- significant (P>0.05).

Table IV Clinical pocket depth around implant at baseline, 6 months and 1 year

Groups	Baseline		At 6 months		At 1 year		P value
	Mean	SD	Mean	SD	Mean	SD	
Group I	3.5	0.1	3.3	0.1	2.7	0.1	0.05
Group II	3.7	0.2	3.4	0.2	3.1	0.2	

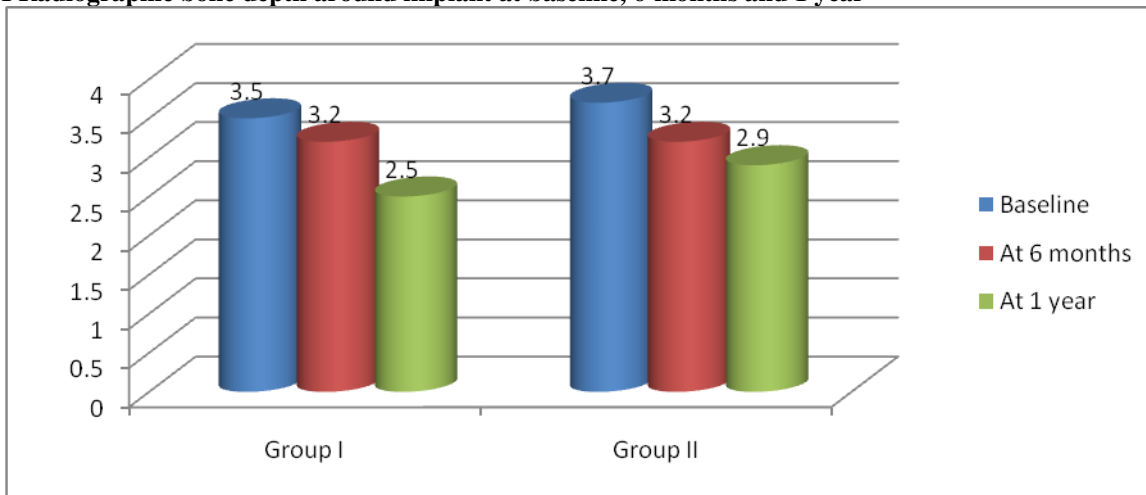
Table IV, shows that in group I, mean clinically pocket depth (mm) around implant at baseline was 3.5± 0.1, at 6 months was 3.3± 0.1 and at 1 year was 2.7± 0.1. In group II, it was 3.7± 0.2, at 6 months was 3.4± 0.2 and at 1 year was 3.1± 0.2. The difference found to be statistically significant (P< 0.05).

Table V Clinical pocket depth at adjacent teeth at baseline, 6months and 1 year

Groups	Baseline		At 3 months		At 6 months		P value
	Mean	SD	Mean	SD	Mean	SD	
Group A	3.6	0.1	3.3	0.1	2.7	0.1	0.04
Group B	3.5	0.2	3.0	0.2	2.5	0.2	

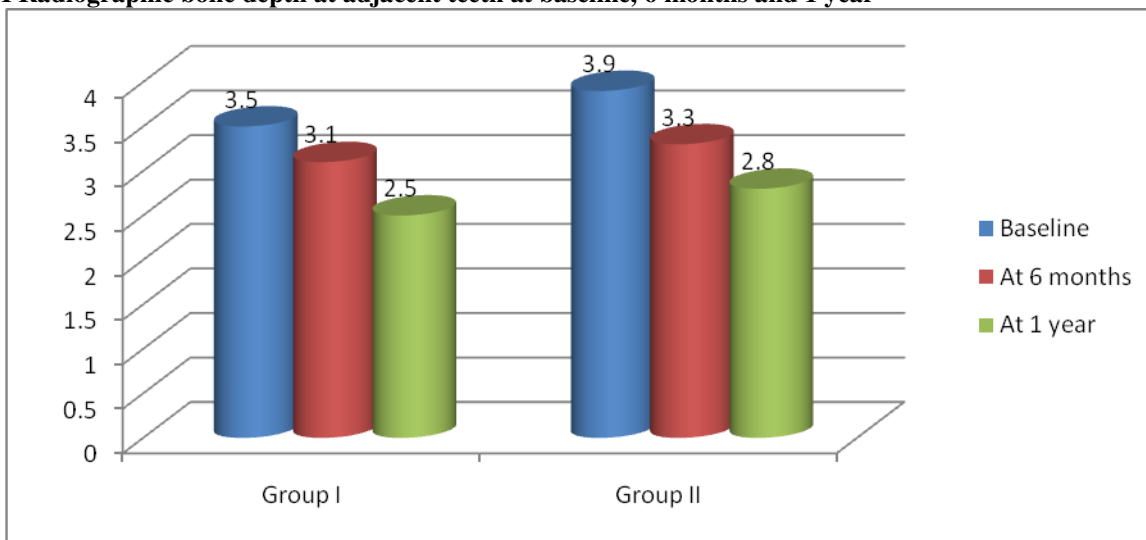
Table V shows that in group I, mean clinically pocket depth (mm) at adjacent teeth at baseline was 3.6 ± 0.1 , at 6 months was 3.3 ± 0.1 and at 6 months was 2.7 ± 0.1 . In group II, it was 3.5 ± 0.2 , at 3 months was 3.0 ± 0.2 and at 6 months was 2.5 ± 0.2 . The difference found to be statistically significant ($P < 0.05$).

Graph I Radiographic bone depth around implant at baseline, 6 months and 1 year



Graph I shows that in group I, mean radiographic pocket depth (mm) around implant at baseline was 3.5 ± 0.1 , at 6 months was 3.2 ± 0.1 and at 1 year was 2.5 ± 0.1 . In group II, it was 3.7 ± 0.2 , at 6 months was 3.2 ± 0.2 and at 1 year was 2.9 ± 0.2 . The difference found to be statistically significant ($P < 0.05$).

Graph II Radiographic bone depth at adjacent teeth at baseline, 6 months and 1 year



Graph II shows that in group I, mean radiographic pocket depth (mm) at adjacent teeth at baseline was 3.5 ± 0.1 , at 6 months was 3.1 ± 0.1 and at 1 year was 2.5 ± 0.1 . In group II, it was 3.9 ± 0.2 , at 6 months was 3.3 ± 0.2 and at 1 year was 2.8 ± 0.2 . The difference found to be statistically significant ($P < 0.05$).

DISCUSSION

Dental implants can replace missing teeth and provide adequate long-term success rates. In the early years, research mainly focused on the advent of hard tissue integration, on the design of two-piece implants and their surface roughness.⁶ The success rates for rough-surfaced endosseous implants have been shown to be greater than 90%. The crestal bone levels have been described to be typically located approximately 1.5 to 2 mm below the implant-abutment junction (IAJ) at 1 year following implant restoration at the level of the first thread of two-piece implants.⁷ In present study, we assessed outcome of dental implants and teeth in different age groups clinico-radiographically.

In present study, age group 18-39 years and 40-60 years had 20 patients each. Abreu et al⁸ in their study found that mean age of the patients was 46.83 years with minimum age 22 and maximum age was 86 years. In present study, group I and II had equal number of males (10) and females (10). Mahindra K⁹ found that out of 41 patients, males were 13 and females were 28. Pathak et al¹⁰ found that out of 25 subjects, males were 12 and females were 13.

We found that mean BOP in group I and group II at baseline, 6 months and 1 year around implant was non-significant. Similarly, mean BOP in group I and group II at baseline, 6 months and 1 year at adjacent teeth was statistically non-significant ($P > 0.05$). Bhardwaj et al¹¹ found mean value for sBI at 3 weeks 0.00 ± 0.00 , 3 months 0.3 ± 0.11 , at 6 months 0.09 ± 0.25 , and at 9 months 0.08 ± 0.24 . Nandal et al¹² found that the mean mBII was comparatively high in control teeth than implants in all assessed periods.

In present study, in group I, mean clinically pocket depth (mm) around implant at baseline was 3.5 ± 0.1 , at 6 months was 3.3 ± 0.1 and at 1 year was 2.7 ± 0.1 . In group II, it was 3.7 ± 0.2 , at 6 months was 3.4 ± 0.2 and at 1 year was 3.1 ± 0.2 . Similarly, in group I, mean clinically pocket depth (mm) at adjacent teeth at baseline was 3.6 ± 0.1 , at 6 months was 3.3 ± 0.1 and at 6 months was 2.7 ± 0.1 . In group II, it was 3.5 ± 0.2 , at 3 months was 3.0 ± 0.2 and at 6 months was 2.5 ± 0.2 . The difference found to be significant ($P < 0.05$). Negri et al¹³ in a study of twenty-five participants with 28 implant supported crowns found that PPD decreased from 1 month to 12 months in both implants and in control teeth. PPD was found to be more on implants than in control teeth.

In present study, in group I, mean radiographic pocket depth (mm) around implant at baseline was 3.5 ± 0.1 , at 6 months was 3.2 ± 0.1 and at 1 year was 2.5 ± 0.1 . In group II, it was 3.7 ± 0.2 , at 6 months was 3.2 ± 0.2 and at 1 year was 2.9 ± 0.2 . Similarly, in group I, mean radiographic pocket depth (mm) at adjacent teeth at baseline was 3.5 ± 0.1 , at 6 months was 3.1 ± 0.1 and at 1 year was 2.5 ± 0.1 . In group II, it was 3.9 ± 0.2 , at 6 months was 3.3 ± 0.2 and at 1 year was 2.8 ± 0.2 . Rajpal et al¹⁴ found that the crestal bone loss of all subjects at baseline, after 1 month, after 3

months and after 6 months ranged from 0 to 0, 0 to 1.5, 0.25 to 1.50, and 0.25 to 1.75 respectively with mean (\pm SE) 0.00 ± 0.00 , 0.58 ± 0.16 , 0.90 ± 0.16 , and 1.13 ± 0.14 respectively. No peri-implant radiolucency was found at the level of 1, 3 and 6 months interval from the baseline.

CONCLUSION

Authors concluded that for successful dental implant therapy, there should be adequate bone level around implants and adjacent teeth. There is considerable less pocket depth, bleeding on probing index and radiographic bone loss in young adults as compared to old patients.

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