

Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

NLM ID: 101716117

Journal home page: www.jamdsr.com

doi: 10.21276/jamdsr

Index Copernicus value = 85.10

(e) ISSN Online: 2321-9599;

(p) ISSN Print: 2348-6805

Original Research

Analysis of outcome of Single Tooth Implant in healed Extraction Site

Sandeep Vaidya¹ Santosh Kumar²

¹MDS (Oral and maxillofacial surgery), Private Practitioner, Himachal Pradesh;

²MDS (Oral and Maxillofacial Surgery), Medical Officer (Dental), Himachal Pradesh

ABSTRACT:

Background: The timing of implant placement has changed over a period of time with advancement in clinical techniques and introduction of novel biomaterials of dental implants. The short-term survival rate of implant placement seems similar between immediate, early, and delayed approaches. **Material and methods:** The present study was undertaken for analysing the outcome of Single Tooth Implant in healed Extraction Site. A total of 40 patients were selected for this study who underwent an extraction at least 3 months before reporting for tooth replacement. All demographic details of the patients were recorded. Radiograph of the healed extraction site was taken to ascertain proper bone healing and remodelling. Patients were thoroughly evaluated for medical and clinical findings. A pre-operative radiographic assessment was carried out. Soft tissue contour and texture was evaluated at the healed extraction site. An immediate post implant placement radiograph was also taken. At follow up appointments proper clinical and radiographic assessment was carried out to evaluate bone levels around implants and soft tissue health was also verified. **Results:** At 6 months follow up an intact mesial interproximal papilla was seen in 28 out of 40 patients (70%). 30% cases showed loss of mesial interproximal papilla. Similarly, at 6 months follow up an intact distal interproximal papilla was seen in 26 out of 40 patients (65%). 35% cases showed loss of distal interproximal papilla. At 1 year follow up an intact mesial interproximal papilla was seen in 31 out of 40 patients (77.5%). 22.5% cases showed loss of mesial interproximal papilla. Similarly, at 1 year follow up an intact distal interproximal papilla was seen in 29 out of 40 patients (72.5%). 27.5% cases showed loss of distal interproximal papilla. Mean marginal bone loss at 6 months and 1 year follow up was $.69 \pm .33$ mm and $1.13 \pm .28$ mm respectively. **Conclusion:** This study concluded that delayed placement of implant in a healed extraction socket is more predictive than immediate placement of dental implants.

Key words: Dental implant, immediate placement, interdental papilla, rehabilitation

Received: 12 March, 2020

Accepted: 28 April, 2020

Corresponding author: Dr. Santosh Kumar, MDS (Oral and Maxillofacial Surgery), Medical Officer (Dental), Himachal Pradesh, India

This article may be cited as: Vaidya S, Kumar S. Analysis of outcome of Single Tooth Implant in healed Extraction Site. J Adv Med Dent Sci Res 2020;8(6):30-33.

INTRODUCTION

A multitude of prosthodontic techniques are available for the rehabilitation of an edentulous area pertaining to a single-tooth space. Treatment options previously available for tooth rehabilitation included; removable partial denture, and fixed partial denture. As the implant dentistry has evolved over the ages, these options are presently outdated.¹ Implant surgery is the second oldest discipline in dentistry after exodontia. An endosteal implant is an alloplastic material which is surgically inserted into a residual bony ridge, primarily as the prosthetic foundation. An endosteal implant is basically comprised of different components which include: implant body, prosthetic

abutment with a screw, cover screw and healing screw.²

The dental implant provides many esthetically and hygienically viable options in the form of single tooth dental implant, implant-supported fixed partial denture and overdenture. The timing of implant placement has changed over a period of time with advancement in clinical techniques and introduction of novel biomaterials of dental implants. Esposito et al proposed a classification in 2006 and categorized dental implant placement into immediate, immediate-delayed, delayed. Immediate refers to implant placement into a fresh extraction socket. Immediate delayed is, when the implant is placed within 8 weeks

of extraction. Delayed includes dental implant placed post extraction after 8 weeks.³ Esthetic demand and patient satisfaction have led to increasing preference for placement of dental implants immediately after extraction. Though there are advantages with the immediate placement of dental implants, such as reduction in the time for osseointegration, the survival rate has been lower compared to that of delayed placement.⁴

As an alternative to immediate implant placement, delayed placement has several advantages. These include restoration of infection at the site and an increase in the area and volume of soft tissue for flap adaptation. However, these advantages are diminished by concomitant ridge resorption in the buccolingual direction. Thus, 4–8 weeks appears to be the optimal period to defer implant placement to allow adequate soft tissue healing to take place without under loss of bone volume.⁵ Hence, the present study was undertaken for analysing the outcome of Single Tooth Implant in healed Extraction Site.

MATERIAL AND METHODS

The present study was undertaken for analysing the outcome of Single Tooth Implant in healed Extraction Site. A total of 40 patients were selected for this study who underwent an extraction atleast 3 months before

reporting for tooth replacement. All demographic details of the patients were recorded. Radiograph of the healed extraction site was taken to ascertain proper bone healing and remodelling.

Inclusion criteria

- Age > 18 years and < 65 years.
- Adequate vitamin D and Calcium profile.
- Absence of systemic diseases.
- Inadequate bone remodelling as apparent on radiograph.
- Presence of good oral hygiene

Patients were thoroughly evaluated for medical and clinical findings. A pre-operative radiographic assessment was carried out. Soft tissue contour and texture was evaluated at the healed extraction site. An immediate post implant placement radiograph was also taken. At follow up appointments proper clinical and radiographic assessment was carried out to evaluate bone levels around implants and soft tissue health was also verified.

The entire data was assembled and recorded in Microsoft excel sheet. Spss software was used to carry out statistical analysis. Chi-square test and student t test were used to check the significance of results.

RESULTS

Out of the 40 patients selected for this study, 24 were males and the remaining 16 were females. Males constituted 60% of the sample size whereas the females comprised of 40 percent. Based on the age the patients were divided into 3 groups: Group 1: 18-35 years, Group 2: 36-50 years, Group 3: 51-65 years(table 1).

Table 1: Demographic details

Parameter	Number of patients	Percentage of patients
Age : 18-35 years	09	22.5%
36-50 years	13	32.5%
51-65 years	18	45%
Gender : Males	24	60%
Females	16	40%

A 6 months and 1 year follow up of these patients was carried out to check the levels of marginal bone loss, and status of interproximal papilla. At 6 months follow up an intact mesial interproximal papilla was seen in 28 out of 40 patients (70%). 30% cases showed loss of mesial interproximal papilla. Similarly, at 6 months follow up an intact distal interproximal papilla was seen in 26 out of 40 patients(65%). 35% cases showed loss of distal interproximal papilla. . At 1 year follow up an intact mesial interproximal papilla was seen in 31 out of 40 patients(77.5%). 22.5% cases showed loss of mesial interproximal papilla. Similarly, at 1 year follow up an intact distal interproximal papilla was seen in 29 out of 40 patients(72.5%). 27.5% cases showed loss of distal interproximal papilla.(table 2)

Table 2: Evaluation of interproximal papilla at 6 months and one year follow up (both mesial and distal papilla)

Follow up	Mesial papilla	Percentage	Distal papilla	Percentage
6 months	Intact :28	70%	Intact :26	65%
	Lost : 12	30%	Lost : 14	35%
1 year	Intact :31	77.5%	Intact :29	72.5%
	Lost : 09	22.5%	Lost : 11	27.5%

Mean marginal bone loss at 6 months and 1 year follow up was .69±.33mm and 1.13±.28mm respectively. The P values at 6 month were .087 and at 1 year was .294. Both these values were non-significant.

Table 3: Mean marginal bone loss at 6 months and 1 year.

Follow up	Mean marginal bone loss	P-value
6 months	.69±.33mm	.087
1 year	1.13±.28mm	.294

DISCUSSION

The original protocol for treatment with dental implants introduced by Branemark (1985) has been challenged within the last decades. One matter of interest has been to investigate whether it is possible to shorten the time period between tooth extraction and placement of the implant, alternatively to insert the implant at the same visit as the removal of the tooth (immediate implantation). In addition to the obvious benefits for the patient in terms of fewer surgical sessions and a more expeditious delivery of the final implant restoration, the immediate or delayed-immediate concepts may be advantageous from a biologic viewpoint. Previous studies have shown that early implant placement may lead to preservation of alveolar bone height and width.⁶ The marginal bone level was measured as the distance from the implant crown border to the most coronal point where the marginal bone met the implant. (16) The marginal bone loss around the implant is inevitable.⁷ Delayed approach, the conventional approach, is 4 to 6 months after extraction. This approach has the longest treatment time, bone resorption during socket healing, and requires extra surgical procedures. However, trend shows to have less implant failures in this approach.⁸

Out of the 40 patients selected for this study, 24 were males and the remaining 16 were females. Males constituted 60% of the sample size whereas the females comprised of 40 percent. Based on the age the patients were divided into 3 groups: Group 1: 18-35 years, Group 2: 36-50 years, Group 3: 51-65 years. M. Clementini et al 2013 compared success rates in immediate and delayed implant placement following GBR and onlay block ridge augmentation. The author concluded that it is difficult to determine clear indication of immediate and delayed implant placement but suggest immediate implant placement when the residual alveolar bone present with adequate quantity and quality. However in this review, suggested that in GBR and onlay grafting area, delayed placement is more predictive than immediate placement of dental implants.⁹

A 6 months and 1 year follow up of these patients was carried out to check the levels of marginal bone loss, and status of interproximal papilla. At 6 months follow up an intact mesial interproximal papilla was seen in 28 out of 40 patients(70%). 30% cases showed loss of mesial interproximal papilla. Similarly, at 6 months follow up an intact distal interproximal papilla was seen in 26 out of 40 patients(65%). 35% cases showed loss of distal interproximal papilla. At 1 year follow up an intact mesial interproximal papilla was seen in 31 out of 40 patients(77.5%). 22.5% cases showed loss of mesial interproximal papilla.

Similarly, at 1 year follow up an intact distal interproximal papilla was seen in 29 out of 40 patients(72.5%). 27.5% cases showed loss of distal interproximal papilla(table 2). P. Felice, M. Esposito et al 2011 compared immediate non occlusal loading with the delayed placement of a single implant in the anterior maxilla. They summarized their study that there are more complication in immediate implant when compared to delayed implant but the aesthetic outcome is similar for both group.

The current study found the mean marginal bone loss at 6 months and 1 year follow up was .69±.33mm and 1.13±.28mm respectively. The P values at 6 month was .087 and at 1 year was .294. Both these values were non-significant. D. Rodrigo et al 2012 evaluated clinically and radiographically immediate implants 5 years after insertion and compared them with delayed-placed implants in the same patient. He concluded in his study that after 1 year of loading, the sites with probing depth >5 mm were higher for the Group II (immediate implant) compared to DI (delayed implant) and found no significant statistical differences in probing depth.

CONCLUSION

This study concluded that delayed placement of implant in a healed extraction socket is more predictive than immediate placement of dental implants. Further studies on this topic would help to validate the findings of this study.

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