# Original ARTICLE

## Analysis of outcome of Single Tooth Implant in Immediate Extraction Site

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**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. Hence; the present study was undertaken for analysing the outcome of Single Tooth Implant in Immediate Extraction Site. **Materials & methods:** A total of 20 patients were selected with hopeless tooth planned for extraction and missing tooth. Patients included in the study were evaluated thoroughly, which comprised of medical history and clinical evaluation. Extraction of the tooth was done and immediate placement of dental implant was carried out. Radiographic and clinical evaluation was done on follow-up for evaluating the prognosis. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. **Results:** Mean age of the patients was 33.7 years. There were 14 males and 6 females. At 6 months and 1 year follow-up, loss of interproximal papilla on mesial side was found to occur in 10 percent and 15 percent of the patients. At 6 months and 1 year follow-up, loss of interproximal papilla on distal side was found to occur in 15 percent and 25 percent of the patients. **Conclusion:** Immediate implant placement needs less surgical time and provide immediate rehabilitation with immediate restoration of function.
**Key words:** Implant, Immediate, Extraction

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**INTRODUCTION**
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.[1, 2] Whereas impression taking components include transfer abutments and implant analog. Single tooth implant is a better option for providing an immediate option for tooth replacement. The question still baffles all as to, what should be the appropriate time for implant placement in a missing tooth scenario.[3] 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.[4- 6]
Immediate implant placement, defined as the placement of dental implant immediately into fresh extraction socket site after tooth extraction, has been considered a predictable and acceptable procedure. The advantage of immediate implant placement into the extraction sockets over the delayed placement of implants are there is no need to wait for 4–6 months after extraction for the bone to form and crestal bone loss is found to be less in immediately placed implants rather than delayed placed implants. Immediate implant placement in fresh extraction socket preserves the bony architecture of alveolar bone. Labial/buccal and palatal/lingual bone after extraction undergoes substantial resorption. Buccal bone is predominately composed of bundle bone; the bundle bone resorbs completely as a result of lack of supporting function of the tooth following extraction. These physiologic events can be detrimental to achieve final aesthetic results, as bony remodeling results in both horizontal and vertical bone loss.[5- 7] Hence; the present study was undertaken for analysing the outcome of Single Tooth Implant in Immediate Extraction Site

**MATERIALS & METHODS**
The present study was undertaken for analysing the outcome of single tooth implant in immediate extraction site. A total of 20 patients were selected with hopeless tooth planned for extraction and missing tooth.
**Inclusion criteria**
- At least 18 years old.
- Good oral hygiene.
- Absence of purulent infection.

- Absence of periodontal disease.
- Adequate bone volume to receive the dental implant.
- Presence of a single failing tooth in the maxilla and mandible with both neighbouring teeth present.

Patients included in the study were evaluated thoroughly, which comprised of medical history and clinical evaluation. Clinical evaluation included extraction history in case of missing tooth, mesiodiatal and labio/buccopalatal dimension in missing tooth space and around hopeless tooth. Extraction of the tooth was done and immediate placement of dental implant was carried out. Radiographic and clinical evaluation was done on follow-up for evaluating the prognosis. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi-square test and student t test were used for evaluating the level of significance.

## RESULTS

In the present study, a total of 20 patients were analysed. Mean age of the patients was 33.7 years. There were 14 males and 6 females. At 6 months and 1 year follow-up, loss of interproximal papilla on mesial side was found to occur in 10 percent and 15 percent of the patients. In the present study, at 6 months and 1 year follow-up, loss of interproximal papilla on distal side was found to occur in 15 percent and 25 percent of the patients.

**Table 1:** Age and gender-wise distribution of patients

| Parameter | | Number of patients | Percentage of patients |
|---|---|---|---|
| **Age group (years)** | Less than 25 | 7 | 35 |
| | More than 25 | 13 | 65 |
| **Gender** | Males | 14 | 70 |
| | Females | 6 | 30 |

**Table 2:** Interproximal papilla (Mesial side) evaluation on 6 months and one year follow-up

| Interproximal papilla | | Number of patients | Percentage of patients |
|---|---|---|---|
| **6 months follow-up** | Intact | 18 | 90 |
| | Lost | 2 | 10 |
| **1 year follow-up** | Intact | 17 | 85 |
| | Lost | 3 | 15 |

**Table 3:** Interproximal papilla (Distal side) evaluation on 6 months and one year follow-up

| Interproximal papilla | | Number of patients | Percentage of patients |
|---|---|---|---|
| **6 months follow-up** | Intact | 17 | 85 |
| | Lost | 3 | 15 |
| **1 year follow-up** | Intact | 15 | 75 |
| | Lost | 5 | 25 |

## DISCUSSION

Clinical research in recent years has dealt with this aspect to a great extent. Investigations have highlighted the influence of clinical treatment procedures such as the time of implant placement, the effects of additional hard and soft tissue management, and the macro and microdesign. Nowadays advances in clinical techniques and biomaterials have facilitated a great expansion in the indications for dental implant treatment options. Teeth replacement using dental implants has proven to be a successful and predictable treatment procedure; different placement and loading protocols have evolved from the first protocols in order to achieve quicker and easier surgical treatment times. Immediate placement of a dental implant in an extraction socket was initially described more than 30 years ago. Reductions in the number of surgical interventions, a shorter treatment time, an ideal three dimensional implant positioning, the presumptive preservation of alveolar bone at the side of the tooth extraction and soft tissue aesthetics have been claimed as the potential advantages of this treatment approach. On the other hand, the morphology of the side, the presence of periapical pathology, the absence of keratinized tissue, thin tissue biotype and lack of complete soft tissue closure over the extraction socket have been reported to adversely affect in immediately placed implants.[7-9] Hence; the present study was undertaken for analysing the outcome of Single Tooth Implant in Immediate Extraction Site

In the present study, a total of 20 patients were analysed. Mean age of the patients was 33.7 years. There were 14 males and 6 females. At 6 months and 1 year follow-up, loss of interproximal papilla on mesial side was found to occur in 10 percent and 15 percent of the patients. Mello CC et al compared the survival rate of the implants and the peri-implant tissue changes associated with the immediate implant. The survival rate of delayed implants (98.38%) was significantly greater than immediate implants (95.21%) (p = .001). For the marginal bone loss (p = .32), implant stability quotients values (p = .44), and pocket probing depth (p = .94) there was no significant difference between the analysed groups.[8] Rodrigo D evaluated clinically and radiographically immediate implants 5 years after insertion. The author concluded within the same patients, the implants placed with the immediate protocol demonstrated a higher tendency to crestal bone loss and to peri-implantitis, although these differences were not statistically significant.[9] Felice P et al compared the effectiveness of immediate post-extractive single implants with delayed implants placed in preserved sockets after 4 months of healing. There were more complications at immediate post-extractive implants when compared to delayed implants. The aesthetic outcome appears to be similar for both groups.[10] Steigenga JT et al evaluated the effects of the biomechanical aspects of dental implant design on the quality and strength of osseointegration, the bone–implant interface, and their relationships to the long-term success of dental implants.[11]

In the present study, at 6 months and 1 year follow-up, loss of interproximal papilla on distal side was found to occur in 15 percent and 25 percent of the patients. DI Girolamo M et al determined the respective influence of each parameter, two treatment groups were formed; a strict and standardized study protocol was applied to minimize the influence of bias and confounding factors. The Pink Esthetic Score (PES) - the esthetic out-come of soft tissue appearance was evaluated. Sixteen patients with a single failing tooth in the maxilla and a natural contralateral site were randomly distributed into two groups. Treatment variations affected the provisional restorative in detail, group 1 with immediate implant placement and immediate temporary restoration with the simulation of the first three mm of the root and the seal of the socket, group 2 with immediate implant placement and immediate temporary restoration without the seal of the socket. All patients received the final prosthetic restoration 10–12 weeks after implant placement. The overall scores of the four treatment groups revealed PES values of 8.47 (SD 2.08, group 1), 6.62 (SD 3.24, group 2). The differences between groups 1 and 2 and were statistically significant (P=0.015

and P=0.047). The single parameter analysis displayed a certain range of fluctuation and heterogeneity. Immediate implant placement and restoration appear to be a suitable alternative to early implant placement if an experienced surgeon is entrusted with the implantation procedure.[12]

## CONCLUSION
From the above results, the authors concluded that immediate implant placement needs less surgical time and provide immediate rehabilitation with immediate restoration of function. However; further studies are recommended.

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