



## Immediate Implant Placement in Anterior Maxilla – A Retrospective Study

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### ABSTRACT

Tooth failure in the esthetic region more generally results in a lack of bone volume in the vertical and horizontal direction. On attempts to reduce this alveolar bone resorption to preserve periodontal construction, implant placement was advised immediately after tooth extraction. A retrospective analysis was performed for patients attending a private hospital in Chennai, India. The aim of the study is to study the prevalence of immediate implant placement in the anterior maxilla. Patients who have undergone immediate implant placement in anterior maxilla from June 2019 to March 2020 were included in the study. The data were entered into Microsoft Excel and tabulated. Following which data was imported into the SPSS software by IBM. Data analysis was performed in the statistical software SPSS and data were analyzed by descriptive analysis and Pearson correlation. Within the limits of the study, a total of 77 implants in the anterior maxilla were placed, out of which, 21 implants were immediate implants. From the 21 immediate implants placed, 6 [7.8%] were placed in the anterior maxilla region alone. Immediate Implant in the anterior maxillary region was placed most commonly among the age group 19 to 35 years (14.28%), followed by 9.52% among the age group 55 to 75 years. Immediate Implant in the anterior maxillary region was placed most commonly among the male population (23.81%). Analyzing the etiology of extraction for Immediate Implant Placement, decay (14.29%) was the most common cause of extraction, followed by trauma (9.5%). Replacement assessments can be patient-centred and guided by the patient's wishes.

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### INTRODUCTION

Advances in dental implant treatment will contribute to stable success levels for dental implants (Jain *et al.*, 2017). Within the anterior maxillary region, this becomes more important because of the prominence of the region, because if there is a strong lip line, the smile line becomes more prominent, thereby raising the need for the aesthetic outcome, with some writers rating function and elegance in the anterior maxillary area of equal significance (Kannan and Venugopalan,

2018). Anterior teeth are those specifically picked to enhance beauty. Selection needs both the empirical experience and the technical ability of the dentist (Ariga *et al.*, 2018). Maintaining proper oral health will avoid gingivitis (Basha *et al.*, 2018).

The interdental papilla fully covers the gap between the teeth or replacements and can be accomplished by making the interproximal bone crest within 5 mm of the desired point of contact of the final reconstruction (Ashok and Suvitha, 2016). When the implant is correctly positioned in a suitable 3-dimensional position, an optimal emergence profile is achieved. The placement of an implant at the centre of the edentulous space mesiodistally is utmost important and a minimum of 1.5 mm of space between the implant and the neighbouring natural tooth or, whether this gap is violated, an interdental papilla failure is anticipated. Evaluation of the location in the labial-palatal direction is also critical, as placing too far labially can contribute to the over-contouring of the crown, which can not be fixed prosthetically (Ganapathy *et al.*, 2016). To optimal implant attractiveness, the implant will be positioned 1.5mm to 3.0mm below the CEJ (Vijayalakshmi and Ganapathy, 2016).

Extraction of a tooth implies a loss of a traditional strategy that may lead to reconstructive operation, i.e. immediate implant insertion with immediate packing. This instant loading treatment alternative compensates for the adverse psychological impact of extraction. Immediate activation has two main benefits. The first is the biological impact of the osseointegration of the implant, given the restrictions faced in the healing period. The second is the imperative influence that is rational and comprises the development of the surgical and prosthetic stage in the shortest period practicable (Agarwal *et al.*, 2018; Jain, 2017).

Some of the most attractive aspects of immediate implant placement and provisionalization are its effectiveness in maximizing esthetic performance while maintaining the current bone and gingival architecture (Duraismy *et al.*, 2019). Potential benefits of immediate implants/loading have been recognized, in that the alveolar bone is retained to a degree during detachment so that the individual is not impaired aesthetically so clinically throughout the healing process. Fewer medical operations are required, with diagnosis usually performed within a shorter timeline.

A suitable diagnosis with a successful surgical procedure and prosthodontic treatment is still important for the effectiveness of immediate preparation and immediate implantation. Patient-related con-

siderations such as smoking, a lean gingival biotype, bad oral health and diseases at prospective implant locations are potential indicators when evaluating rapid positioning and loading procedures (Ganapathy *et al.*, 2017). Prosthetic therapy is important in patients with bone defects (Ashok *et al.*, 2014).

The institution has performed a number of research in in-vitro and in-vivo settings (Kannan, 2017). Inspired by the large patient record with appropriate documentation, the present retrospective analysis was planned. Previously our department has published extensive research on various aspects of prosthetic dentistry (Varghese *et al.*, 2019), this vast research experience has inspired us to research about this topic. The aim of the study was to study the prevalence of immediate implant placement in the anterior maxilla.

## MATERIALS AND METHODS

The retrospective study was conducted in a private hospital, Chennai. All patients undergoing immediate implant placement were included in the study and the etiology of extraction was recorded. The retrospective evaluation was conducted by analyzing the data of 86000 patients reported in the out-patient department of a private hospital, Chennai, between June 2019 and March 2020. The collected data were cross-verified by intraoral photographs and radiographs of the respective case sheets.

To minimize sampling bias, the inclusion of all available Data with the exclusion of incomplete data was done. The internal and external validity of data is present. The data was entered in a methodical manner [serial number, name, age, gender, tooth number]. The data were entered into Microsoft Excel and tabulated. Following which data was imported into the SPSS software by IBM. Data analysis was performed in the statistical software SPSS and data were analyzed by descriptive analysis and Pearson correlation.

## RESULTS AND DISCUSSION

Within the limits of the study, a total of 77 implants in the anterior maxilla were placed, out of which, 21 implants were immediate implants. From the 21 immediate implants placed, 6 [7.8%] were placed in the anterior maxilla region alone [Figure 1].

The patients who underwent immediate implant in the anterior maxilla region were distributed according to age as 19 to 35 years, 36 to 55 years, and 55 to 75 years [Figure 2]. Immediate Implants in the anterior maxillary region were placed most commonly among the age group 19 to 35 years (14.28%), fol-

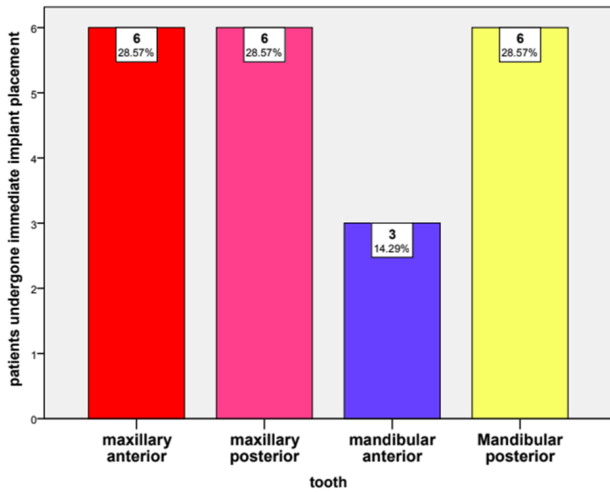


Figure 1: Bar chart showing the arch wise distribution of teeth that have undergone Immediate Implant placement.

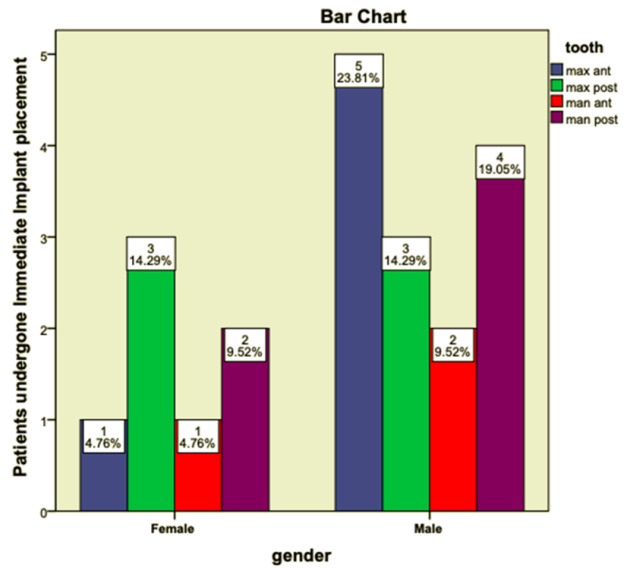


Figure 3: Bar chart showing the association between gender and arch wise distribution of the teeth of patients who have undergone immediate implant placement.

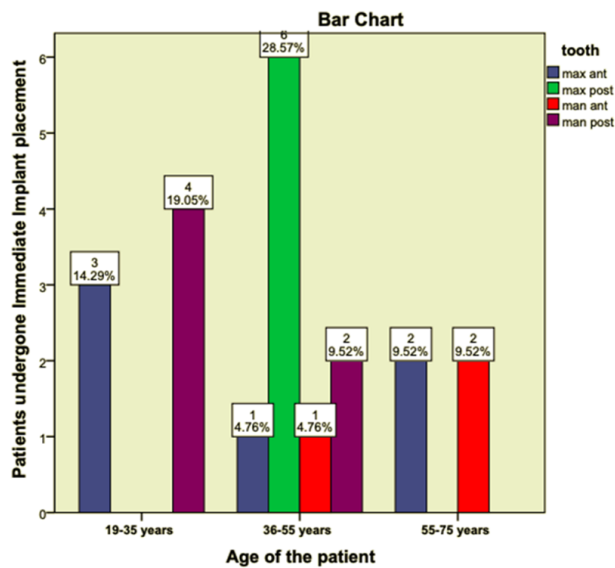


Figure 2: Bar chart showing the association between age and arch wise distribution of the teeth of patients who have undergone immediate implant placement.

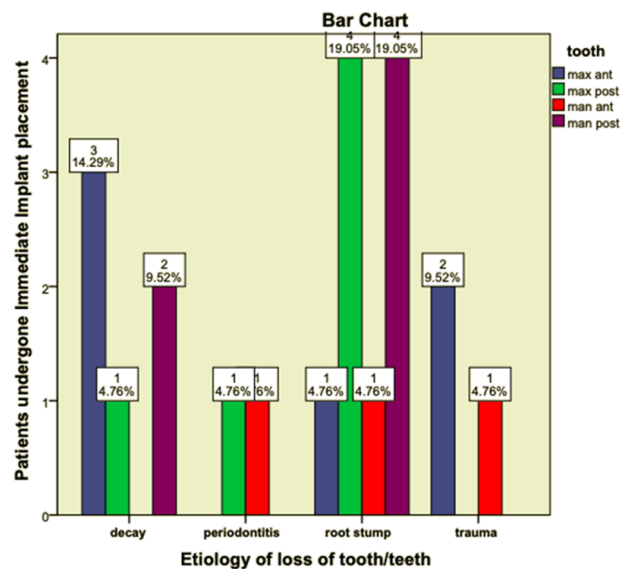


Figure 4: Bar chart showing the association between etiology of extraction of teeth and arch wise distribution of the teeth of patients who have undergone immediate implant placement.

lowed by 9.52% among the age group 55 to 75 years.

Immediate Implant in the anterior maxillary region was placed more commonly among the male population (23.81%) [Figure 3], compared to the female population among the patients who underwent immediate implant. The immediate implants undergone by the study population were distributed arch wise. The prevalence of immediate implant placement was maximum in the anterior maxillary region (red)(28.57%). Immediate implant placement was the least in the mandibular anterior (blue) (14.29%). Analyzing the etiology of extraction for Immediate Implant Placement in the anterior maxilla region, they were decay (14.29%), which was

the most common cause of extraction, followed by trauma (9.5%) and the least being root stumps (4.26%) [Figure 4].

The association between age and arch wise distribution of the teeth of patients who have undergone immediate implant placement was done using Chi-square tests (p-value = 0.008 - significant). Hence there was a significant association between age and arch wise distribution of the teeth of patients who

have undergone immediate implant placement.

The association between gender and arch wise distribution of the teeth of patients who have undergone immediate implant placement was done using the Chi-square test (p-value = 0.682). Hence, there was no significant association between gender and arch wise distribution of the teeth of patients. The association between etiology of extraction of teeth undergone Immediate Implant placement and arch wise distribution of the teeth of patients who have undergone immediate implant placement was assessed using the Chi-square test (p-value = 0.223 -insignificant). Hence, there was no significant association between the etiology of extraction of teeth undergone Immediate Implant placement and arch wise distribution of the teeth.

In the current study, the prevalence of immediate implants in the anterior maxillary region was 15%. Out of the total 77 implants placed in the anterior maxillary region, 10 were immediate implants in the anterior maxilla region. The patients who underwent immediate implant predominantly belonged to the age group 36 to 55 years. The etiology of loss of tooth advised for the immediate implant was predominantly root stumps. Schulte and Heimke initially identified the immediate placement of implants in an extraction socket more than 33 years ago in 1976 (Schropp and Isidor, 2008).

The median micro-gap at the outer, middle and inner points of the implant-abutment interface was 1,597, 1,399, and 1,831  $\mu\text{m}$  (Duraisamy et al., 2019). Wohrle first showed effectiveness with the rapid insertion and provisionalization of single anterior maxillary implants; several trials have proven the feasibility of such procedures. Upon extraction, gauze saturated with Aloe vera when put in the socket and asked by the patient to bite on it shows increased healing and blood clot forming (Subasree et al., 2016). The performance rate for maxilla was 66- 95.5 per cent (Ariga, 2018). Atraumatic extraction is the secret to the effective installation of a single visit implant in the esthetic region (Anbu, 2019).

The cosmetic result is primarily decided by the safe and secure peri-implant tissues as well as the constructed crown of the implant. Many aesthetic indices, such as the Crown Esthetic Index (ICAI), the Pink Esthetic Score (PES), and the White Esthetic Score (WES), have been developed to objective the aesthetic result, whereas, for patient-centred results, The Oral Health Impact Profile (OHIP) was created (Selvan and Ganapathy, 2016; Venugopalan et al., 2014). Potential irritant effects of different denture base styles on gingival tissues have been documented (Jyothi et al., 2017). There is an

increasing trend to position implants directly after detachment, often paired with rapid provisionalization. Immediate implant survival was good, 97% after one year of follow-up, and equivalent to the previously reported survival rate (Ashok and Ganapathy, 2019). Those are significant findings, which highlight the benefit of immediate provisionalization since the survival rate of implants was not lower than that of delayed provisionalisation.

Upon atraumatic tooth extraction, the initial planning of the osteotomy starts with a 2 mm circular drill with copious irrigation through the surgical guidance for optimum mesiodistal location. In order to prevent disruption to the buccal cortical layer, the drill tip will be located along the palatal wall of the extraction socket, 3-5 mm coronal to the apical end of the extraction socket. Cement-retained restorations are the most popular method of reconstruction of implants. Numerous dental lubricants are used either briefly or indefinitely for the cementation of the restorations. It is not suggested that no one cement is better than the other in the retention of cement-retained crowns (CRC) for the implantation of abutments. Zinc phosphate and zinc polycarboxylate are the two types of cement widely used in implant restorations (Ajay et al., 2017).

In the past two years, tests have found that immediate implants are equal, if not equivalent, to deferred insertion in terms of longevity, bone integrity, papillary aesthetics, and patient satisfaction (Ashraf et al., 2017). This trend is possibly the product of changing social conditions, increasingly challenging patients, and a need for fast outcomes, among other causes. The abutment screw was a growing surgical mishap impacting the long-term effectiveness of the implant. Immediate implant placement as such a flexible technique has a strong success rate where thorough patient preparation and clinical preparations are carried out.

## CONCLUSION

Within the limits of the study, a total of 77 implants were inserted in the anterior maxilla during the framework of the research, of which 21 were immediate implants. Of the 21 immediate implants put, 6 [7.8%] alone were positioned in the anterior maxilla area. Immediate Implants in the anterior maxillary region were placed most commonly among the age group 19 to 35 years (14.28%), followed by 9.52% among the age group 55 to 75 years. The prevalence of immediate implant placement was maximum in the anterior maxillary region (28.57%). Immediate implant placement was the least in the mandibular anterior (14.29%).

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The authors declare that they have no funding support for this study.

## Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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