
Clinical Experience,

“A Clinico-Radiographic Evaluation of Immediate Loaded Dental Implants Placed In Fresh Extraction Sockets or Healed Sites in Periodontally Compromised Patients”

A Comparative Study

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Introduction:

Historically, one of the major reasons for tooth extractions or tooth loss has been severe periodontitis either acute or chronic. However, a removable partial denture or a complete denture often produces several problems leading to loss of taste, feeling of premature aging and loss of self confidence.^{1,5} Furthermore, from a functional point of view, treated patients may not be able to cope with the removable prostheses during healing phases, due to bad retention of the provisionals, or may even ask for an immediate treatment solution for functional and esthetic reasons. Consequently, there has been a need or at least a wish for the development of routine implant protocols, decreasing or even eliminating the healing periods before loading inserted implants.³ Immediate implant placement and loading of implant reduces treatment time while providing high predictability and excellent esthetic outcome which are goals for the development of dental implant treatment resulting from severe periodontitis would benefit from use of such a treatment modality, especially if those teeth could be extracted and immediate implant and a prosthesis provided. However, information regarding immediate implant placement in patient with severe periodontitis has been limited.⁷

Materials and Methods:

This study was done in SGT Dental College Gurugram (HR) in the dept. Of Oral and Maxillofacial Surgery between year 2010-2013 and was conducted on 30 extraction sites. Patients having severe periodontitis reporting to the OMFS department were included. 15 implants were placed in fresh extraction sockets and 15 were placed in healed sockets. Immediate prosthetic rehabilitation was carried month out in all the implants. At least 6 month follow up was carried out that included visits at 15th day, third month and sixth month. Pre-surgical preparations Patients were given periodontal treatment prior to implant insertion, including oral hygiene instructions, scaling, and root planing to control inflammation and minimize the ill effect on healing. Patient were initiated with a

daily dose of 500 mg Amoxicillin & Metronizole 400 mg, 8 hourly, orally, 1 day prior to surgery. Strict aseptic protocol was followed.

Surgical procedure:

Fresh Extraction Group with immediate loading:-Teeth were extracted atraumatically. Every attempt was made to have minimal trauma to alveolus during extraction the extraction sockets were thoroughly debrided and curetted. Length and diameter of extracted tooth root was measured and implant was selected. Drilling was done for preparation of extracted socket. Implant was placed in prepared site and 45 Ncm² of torque was achieved. Abutment was placed over the implant and soft tissue closure was done by 3-0 silk suture. Patients was recalled on next day for placement of

temporary restoration.

Healed site group with immediate loading:

Crestal Incision was made little lingually which gives better exposure when buccal flap is retracted. A full thickness mucoperiosteal flap was raised. Indentation was made by 703 round bur at the implant placement site. Osteotomy preparation was started initially by 2mm drill. Parrelling pin was placed in the osteotomy site, Sequential osteotomy preparation was done. Implant placement was carried out and tightened with torque wrench till 45Ncm² Abutment was placed over the implant and soft tissue closure was done by 3-0 silk suture. Patient was recalled on next day for placement of temporary restoration.

"Extraction & Healed site with immediate loading"

Preoperative Photograph:-



Intraoperative Photograph:-



Postoperative 15th day



Postoperative 3th month



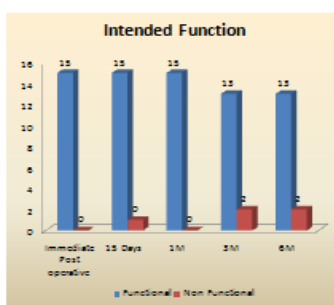
Postoperative 6th month



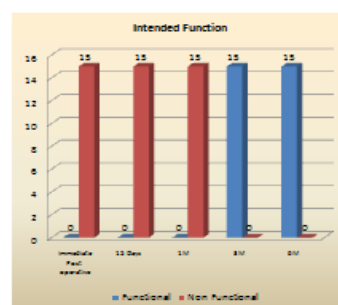
Results:

The purpose of this study is to determine the success of dental implant placed immediately into fresh extraction socket versus implant placed in healed site with immediate loading, by evaluating through following parameters such as pain (from immediate to 6 month) , mobility (from immediate to 6 month) , intended function (from immediate to 6 month) , crestal bone resorption (from immediate to 6month) , peri-implant radiolucency (from immediate to 6 month) . A total of 30 implants were placed in 18 patients, 15 implants in fresh extraction group and 15 implants in healed site group with immediate loading. All the patients having at least one or more site for implant placement. After placement of implant with immediate loading, evaluation was done immediate post operative and in follow up visits.

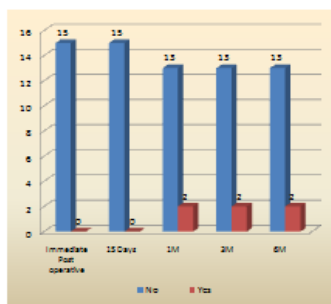
Graph No. 1 shows Intended function in fresh extraction group with immediate loading. Vertical column showing no. of implant placement site.



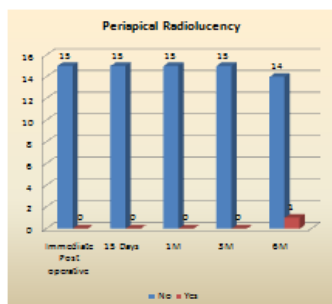
Graph no. 2 shows intended function in healed site with immediate loading. Vertical column showing no. of implant placement site.



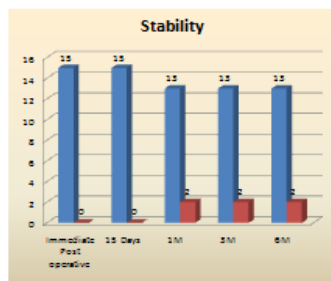
Graph 3 shows periapical radiolucency in fresh extraction group. Vertical column showing no. of implant placement site.



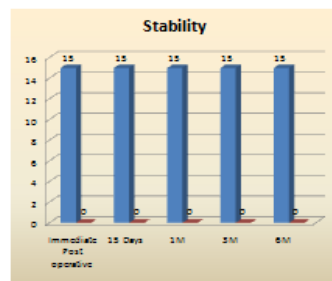
Graph 4 shows periapical radiolucency in healed site group. Vertical column showing no. of implant placement site.



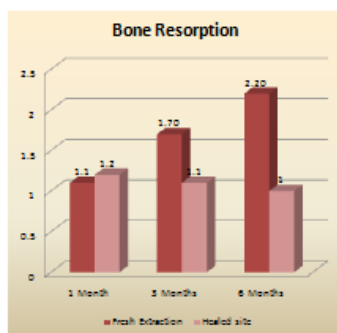
Graph no 5 shows stability in fresh extraction group. Vertical column showing no. of implant placement site.



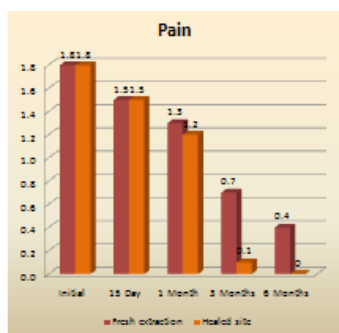
Graph no 6 shows stability in healed site group. Vertical column showing no. of implant placement site.



Graph no 7 shows bone resorption in fresh extraction group and healed site group with immediate loading. Vertical column shows resorption in mm.



Graph no 8 shows pain in fresh extraction group and the healed site group with immediate loading.



Discussion:

Implant dentistry has improved dramatically in the last 20 years, providing clinicians with new opportunities for dental rehabilitation that were previously considered impossible. Dental implant therapy is one of the pioneering treatment modalities for replacement of missing teeth. This has gained popularity and acceptance among the patient, as well as among dentists. It is understandable that patients are more satisfied with implant supported prosthetic rehabilitation in terms of comfort,

stability and esthetics compared to conventional prosthesis. Patients usually consider implant supported prosthesis as an integral part of their body that clearly enhances their daily lives. Osseointegration represents a direct connection between bone and implant without soft tissue layer. A 3 to 6 month³⁴ healing period has been considered a prerequisite for the achievement of osseointegration. Researchers have demonstrated that, during the first few weeks after implant insertion, there were no signs of proper osseointegration. Three months after implant insertion, there was a relatively higher proportion of bone to implant contact and a clearly increased resistance to torque removal. This indicates that osseointegration may be a time-related phenomenon.³⁸ In a study,²⁵ a 91% survival rate at 5 years, for the retrospective group of implants placed in periodontally compromised areas, is comparable with another study in which implants were placed in periodontally compromised patients using the 1-stage approach.^{25,39} This demonstrates that implants can be placed in fresh extraction sockets with immediate function in these situations, but with lower levels of success when compared with noncompromised areas. Different prospective studies^{29,40,41} have evaluated the clinical outcome of immediately loaded implants versus delayed loaded implants in the anterior and premolar regions of the maxilla. Lindeboom ET al⁴² reported no significant differences for radiographic bone loss or gingival esthetics between immediately unloaded and immediately loaded implants. No significant differences between delayed and immediate loading implants in restorations of partially edentulous patients were reported by Cannizzaro ET al.⁴¹ In that study, the authors evaluated 92 dental implants and demonstrated a 100% success rate in the immediate loading group against 92.9% in the control group. According to Ong CT, Ivanovski S, Needleman IG, et al²⁵ 97.4% survival rate after 1 year and the high marginal bone level support the research hypothesis that the functional outcome of implant placement after extraction of teeth presenting endodontic and periodontal lesions or root fracture in the maxilla compares favorably to the results with noninfected sites.^{25,40,41} Limitations of the study include: data from 1 dental practice only, many variables such as type and extent of the pathology at the sites of implant placement, different surgical protocols, and different types of implants and prostheses provided. However, these variations, including the results from the previous study in the mandible,⁴² indicate

that the present protocol may be generally applicable.

The placement of an implant immediately after tooth extraction could result in a defect between the implant surface and the surrounding bone walls. The use of barrier membranes with or without graft materials has been recommended to obtain bone regeneration and to prevent soft tissue growth at the bone-implant interface.^{19,42,43,44} however, the use of barrier membranes may be associated with clinical complications such as bacterial colonization, infection, and impaired bone healing. Several authors have reported high rates of membrane exposure with immediate placement of implants in extraction sockets. Gelb⁴⁵ found that 39% of treated sites showed membrane exposure and required premature removal of the membrane. Becker and coworkers⁴⁶ had to remove 41% of membranes used because of premature oral exposure. Moreover, other authors¹⁶ evaluating the effects of gbr procedures in experimental animals found the greatest bone gain in sites not protected by membranes. This was probably related to the reduced risk of oral exposure and the associated detrimental effects on bone healing. The need for barrier membranes should therefore be carefully evaluated. More recently, some authors⁴⁷ have demonstrated through a histologic analysis that implants placed immediately after extraction without any regenerative procedures could heal like implants placed in healed or mature bone. In the study⁴⁸, periodontal and nonperiodontal patients did not differ in implant failure rate. Several studies did not find statistically significant differences in both short-term and long-term implant survival between patients with a history of periodontitis and healthy individuals.^{48,49,50} thus, a prospective study of periodontal patients by wennstrom et al found a failure rate of only 2.7% after a 5-year follow-up of astra tech implants.⁵⁰ other authors, however, have reported significantly more implant loss in periodontally compromised patients compared with nonperiodontal patients, including karoussis et al in 2003 (9.5% versus 3.5%) and hardt et al in 2002 (8% versus 3%).^{48,51,52,53,54} these results could be caused in part by differences in the definition of periodontitis,^{48,55} which has varied among the studies on implant survival/success and periodontitis.^{48,53} on the other hand, the absence of any difference in the present sample may be attributable to the supportive periodontal care received by most patients and their motivation to

maintain adequate oral hygiene.^{48,56} in fact, quirynten et al recently concluded that the lack of proper supportive periodontal therapy may explain the rather high incidence of failing implants in patients with a history of periodontitis reported in some studies.^{48,57} according to this, ong et al suggested that heterogeneity in supportive therapy might influence the outcomes and differences between studies.^{48,53} however, few studies are available evaluating the relative outcome of longterm supportive programs for implant patients,^{48,56} and there is no evidence to support the impact of these programs for implants as for periodontally treated teeth,^{48,53} even considering the reported association between periodontal status and peri-implant conditions in patients with a history of periodontal disease.^{48,58} overall, all these studies have been highly heterogeneous, and recent consensus documents have called for authors to provide a definition of periodontitis and more data on the periodontal disease of patients to facilitate comparison of results.^{48,59,60} the value of some well-designed studies is reduced by their failure to define periodontitis, their main study variable. Other common factors limiting comparisons between studies are small patient samples, short follow-up periods, or the absence of controls for potential confounders (eg, tobacco use). The small number of studies accepted for inclusion in the most recent systematic reviews reflects these shortcomings.^{48,56,59,61}

Conclusion:

The present study gives the following inferences: The study of all 30 implants, demonstrate a successful osseointegration which was evaluated through radiograph and clinically stability, except 2 implants in a single patient showed unsuccessful osseointegration which resulted in failure-no significant findings were noted in all 30 implants except 2 implants in single patient with respect to, peri-implant radiolucency. pain present in implant site was mild and moderate in initial follow up visits in fresh extraction group and healed site group with immediate loading.-all the implant placed in both the group were made non functional (out off occlusion) during healing time and was made functional after healing period i.e. 3 months. This study had the limitation of sample size and short duration of follow up.with 6 month follow up and survival rate of 92% on immediate placement of implant in fresh extraction socket and with no significant change in healed site with immediate

loading may be considered to be a predictable procedure.

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