

A Clinico-Radiographic Evaluation of Immediate Loading Dental Implants in Fresh Extraction Sockets vs Healed Sites

Type: Research Article

Received: March 15, 2023

Published: April 05, 2023

Citation:

Sudhanshu Agrawal, et al. "A Clinico-Radiographic Evaluation of Immediate Loading Dental Implants in Fresh Extraction Sockets vs Healed Sites". PriMera Scientific Dental Sciences 1.1 (2023): 32-37.

Copyright:

© 2023 Sudhanshu Agrawal, et al. This is an open-access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Indrajeet Singh¹ and Sudhanshu Agrawal^{2*}

Dept. of Oral and Maxillofacial Surgery, Barabanki

Department of Periodontology, Barabanki

***Corresponding Author:** Sudhanshu Agrawal, Dept. of Oral and Maxillofacial Surgery, Barabanki

Abstract

Historically, one of the major reasons for tooth extractions or tooth loss has been severe periodontitis either acute or chronic. A removable partial denture or a complete denture do often presents several problems and can even leads to loss of taste, feeling of premature aging and loss of self confidence.

Introduction

Historically, one of the major reasons for tooth extractions or tooth loss has been severe periodontitis either acute or chronic. A removable partial denture or a complete denture do often presents several problems and can even leads to loss of taste, feeling of premature aging and loss of self confidence. 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. 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 in cases of severe periodontitis would benefit 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.

Materials and Methods

This study was done in Chandra dental college and Hospital Barabanki (U.P) in the Dept. Of Oral and Maxillofacial Surgery between year 2021-2023 and was conducted on 30 extraction sites on patients who were diagnosed with periodontitis. Out of 30 patients included in study 15 implants were placed immediately postextraction and in 15 patients were placed after the extraction sites were healed. 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

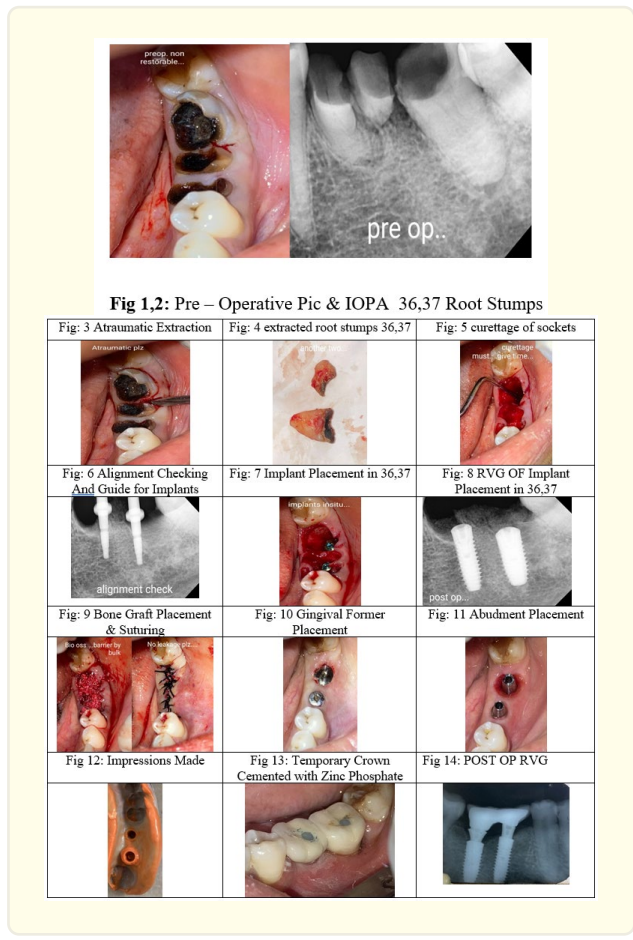
Teeth were extracted atraumatically. Every attempt was made to have minimal trauma to alveolus during extraction the extraction sockets were thoroughly debrided and curetted. Length and diameter of extracted tooth root was measured and implant was selected. Drilling was done for preparation of extracted 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 were 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 burs 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.

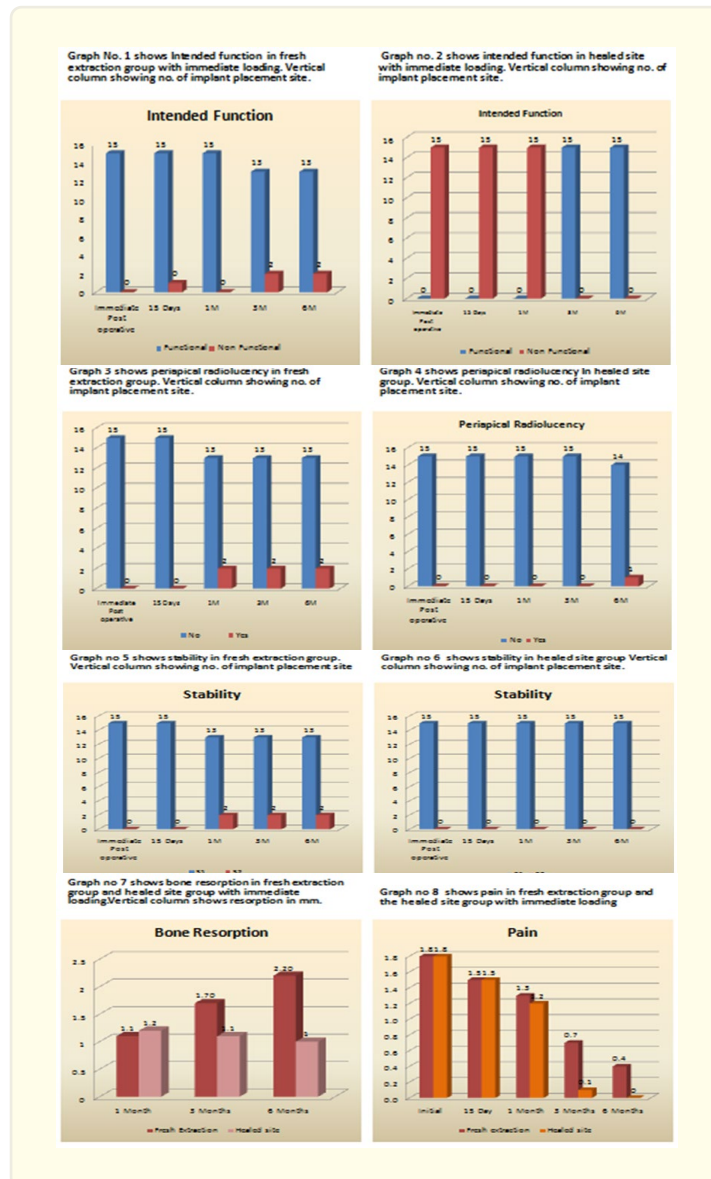
“Extraction & Healed site with immediate loading”

Figures of A case



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.



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 modality 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 month healing period has been considered a prerequisite for the achievement of osseointegration. Researchers have demonstrated that, during first few weeks after implant insertion there were no sign of proper osseointegration. Three months after implant insertion there was relatively higher proportion of bone to implant contact and a clearly increased resistance to torque removal. This indicates osseointegration may be a time related phenomenon. In a study 91% survival rate at 5 years, for the retrospective group of implants placed in periodontally compromised area, is comparable with another study in which implants were placed in periodontally compromised patients using the 1- stage approach. This demonstrates that implants can be placed in fresh extraction socket with immediate function in these situations, but with lower levels of success when compared with non compromised areas. Different prospective studies have evaluated the clinical outcome of immediately loaded implants versus delayed loaded implants in the anterior and premolar regions of the maxilla. Lindeboom ET al reported no significant differences for radiographic bone loss or gingival esthetics between immediate 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. 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 et al, Ivanovski S, Needleman IG, et al 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. 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, 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. 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. Gelb found that 39% of treated sites showed membrane exposure and required premature removal of the membrane. Becker and coworkers had to remove 41% of membranes used because of premature oral exposure. Moreover, other authors 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 study¹⁸, 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. 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. 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%). These results could be caused in part by differences in the definition of periodontitis, which has varied among the studies on implant survival/success and periodontitis. 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. In fact, Quirynen 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. according to this, Ong et al 13 suggested that heterogeneity in supportive therapy might influence the outcomes and differences between studies. however, few studies are available evaluating the relative outcome of long-term supportive programs for implant patients, and there is no evidence to support the impact of these programs for implants as for periodontally compromised teeth, even considering the reported association between periodontal status and peri-implant conditions in patients with a history of periodontal disease. 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. 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.

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 of occlusion) during healing time and was made functional after osseointegration of 3 months. This study had the limitation of sample size and short duration of follow up. With 6 month follow up the survival rate of 92% in cases of immediate placement of implant in fresh extraction socket which presents no significant change against those cases where implants was placed healed site with immediate loading may be considered to be a predictable procedure.

References

1. Deng f,zhang h clinical outcome for inplant placed in fresh extraction socket versus healed sites in periodontally comprised patient, int j oral maxillofac implants 2010;25:1036-1040.
2. Schnitman pa, wohrle ps, rubenstein je, dasilva JD, wand NH ten-year results for branemark implants immediately loaded with fixed prostheses at implant placement. Int j oral maxillofac implants 1997; 12: 495-503.
3. Lekholm u. Immediate/early loading of oral implants in compromised patients. Periodontol 2003; 33:194-203.
4. Roberto villa, bo rangert. Immediate and early function of implants placed in extraction sockets of maxillary infected teeth: a pilot study. J prosthet dent 2007; 97: s96-s10
5. Mengel r, flores-de-jacoby l. Implants in regenerated bone in patients treated for generalized aggressive periodontitis: a prospective longitudinal study. Int j periodontics restorative dent 2005; 25:331-341.
6. Rocci a, martignoni m, gottlow j. immediate loading of brånemark system titanium and machined-surface implants in the posterior mandible: a randomized open-ended clinical trial. Clin implant dent relat res 2003; 5:57- 63.
7. Malchiodi l, corrocher g, cucchi a, long term result of immediately loaded fast bone regeneration coated implant placed in fresh extraction sites in upper jaw. J of oral implantology: 2010.
8. Misch Ce, degidi m. Five-year prospective study of immediate/early loading of fixed prostheses in completely edentulous jaws with a bone quality- based implant system. Clin implant dent relat res 2003; 5:17-28.
9. Rocci a, martignoni m, gottlow j. Immediate loading in the maxilla using flapless surgery, implants placed in predetermined positions, and prefabricated provisional restorations: a retrospective 3-year clinical study. Clin implant dent relatres 2003; 5:29-36.
10. Novaes ab Jr, marcacciniam, souza SL, taba m Jr, grisi mf. Immediate placement of implants into periodontally infected sites in dogs: a histomorphometric study of bone- implant contact. Int j oral maxillofac implants 2003; 18:391-398.
11. Adell r, lekholm u, rockler b, branemark pi. A 15 year study of osseointegrated implants in the treatment of edentulous jaw. Int jr of oral surgery 1981; 10; 387-416.

12. Adell r, lekholm u, rockler b et al. Marginal tissue reactions at osseointegrated titanium fixtures (i) a 3 year longitudinal prospective study. *Int j of oral surg* 1986; 15; 39 - 52.
13. Ellegaard b, baelum v, karring t. Implant therapy in periodontally compromised patients. *Clin oral implants res* 1997; 8:180- 188.
14. Fiske j, Davis d, Frances c, gelbier s. The emotional effects of tooth loss in edentulous people. *Br dent j* 1998; 184:90-93.
15. Hardt cr, grondahl k, lekholm u, wennstrom jl. Outcome of implant therapy in relation to experienced loss of periodontal bone support: a retrospective 5-year study. *Clin oral implants res* 2002; 13:488-494.
16. Novaes ab jr, marcacciniam, souza sl, taba m jr, grisi mf. Immediate placement of implants into periodontally infected sites in dogs: a histomorphometric study of bone-implant contact. *Int j oral maxillofac implants* 2003; 18:391-398.
17. Lekholm u. Immediate/early loading of oral implants in compromised patients. *Periodontol* 2003; 33:194-203.
18. Wolfinger gj, balshi tj, rangert Bo, immediate functional loading of branemark system implant in edentulous mandible. *int j of oral maxillofac implants* 2003; 18:250-257.