

Immediate dental implant placement with immediate loading following extraction of natural teeth

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ABSTRACT

The loss of tooth in the esthetic area is often a traumatic experience for the patient. Patients may suffer real or perceived detrimental effects following the loss of one or more teeth. Dental implant offers the most cost-effective and long-term solution for replacement of missing teeth with high average life expectancy, providing the patient with the best sense of security and well-being. Recently, immediate implant placement after extraction of tooth with early loading has become more common. The advantages of this procedure include fewer surgical interventions, reduction in overall treatment time, reduced soft and hard tissue loss, and psychological satisfaction to the patient. This case report describes the procedure for immediate implant placement with immediate loading of implants by provisional restorations.

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INTRODUCTION

Oral health and oral health care are very important to maintain proper mastication, digestion, phonation, appearance, and psychological well-being. The loss of one or more teeth due to any reason may adversely affect the oral health with an affected appearance being the most serious consequence for the patient and prime reason cited by the patient for seeking prosthodontic treatment. Tooth loss can occur for a variety of reasons which includes congenital absence, trauma, diseases of the dentition (e.g., caries or periodontal disease), as well as mechanical failure. Tooth loss can also occur secondary or concomitantly to various systemic diseases such as cancer,^[1] cardiovascular disease,^[2] diabetes mellitus, and osteoporosis.^[3] Therefore, it is important to not only maintain good oral hygiene, but also overall health.

Patients may suffer real or perceived detrimental effects following the loss of one or more teeth. Psychological effects range from minimal to neuroticism. Tooth loss contributes to loss of confidence, avoidance of laughing in public, reluctance to form close relationship, especially when anterior teeth are missing.^[4]

There are three basic approaches to replace a missing tooth or teeth including removable dental prosthesis, fixed dental prosthesis, and dental implants. Each alternative has its own benefits and shortcomings. It is important to consider the patient’s financial, medical, and emotional condition for the best treatment.

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Most advanced way to replace missing teeth is dental implant which is designed to replicate the natural tooth root and crown of the natural tooth. This procedure preserves the gingival mucosa and bone with no damage to adjacent teeth. Conventional procedure for implant placement involves extraction of offending tooth, waiting 2–4 months for extraction socket to heal, insertion of implant, and again waiting for 3–6 months for integration of implant with surrounding bone; after this procedure, another surgery is necessary to expose the implant and to place a prosthetic abutment.^[5] Taking into consideration the prosthetic treatment, the patient had to wait up to 8–12 months for a lost tooth to be replaced. Because of these shortcomings related to conventional technique, strategies were developed to substantially shorten the entire treatment by placement of implant immediately after extraction of tooth followed by immediate loading of implant with prosthesis.^[6]

Present case reports the immediate esthetic rehabilitation of mandibular anterior teeth followed by extraction with preservation of soft and hard tissue architecture.

CASE REPORT

A 45-year-old female patient was reported to Department of Prosthodontics, with the chief complaint of difficulty in mastication owing to loose teeth in the lower front region of the jaw since 3 months. Clinical examination revealed missing 41, bleeding on probing, gingival recession, and Grade II mobility in relation to tooth 31 and 42 [Figure 1]. Radiographic examination of teeth revealed poor prognosis. The patient was aware of the poor condition of teeth, and willing for extraction of teeth followed by fixed replacement. Patient was explained about all the treatment options available with possible drawbacks of each. She was very concerned about her esthetics and was willing for earliest possible replacement of teeth in question. Hence, she had readily opted procedure of immediate implant with immediate loading. Treatment plan includes oral prophylaxis, extraction of tooth 31, 42, and immediate placement



Figure 1: Preoperative photograph

of implant with immediate loading by temporary prosthesis.

Presurgical radiographic evaluation was done with panoramic radiograph along with dentascan. Appropriate length and width of available bone were determined with the help of dentascan and accordingly dental implants (Touareg-OS, ADIN Dental Implant System, Afula, Israel) were selected for insertion. Patient was premedicated with 2 g amoxicillin, 1 h before surgery. Following injection of 2% lignocaine local anesthetic solution, both the tooth were atraumatically removed [Figure 2]. Extraction sockets were thoroughly debrided and inspected with the help of periodontal probe for any defect or possible perforation of cortical plate.^[7] Osteotomy sites were prepared with sequential order of drills recommended by the manufacturer. Implants were inserted in the prepared osteotomy sites with insertion torque of 45 Ncm, and adequate primary stability was obtained. Postoperative intraoral periapical radiograph was taken, confirming the accuracy of placement of implants. Abutments were attached to the implant body and prepared for parallelism and adequate space [Figure 3]. Provisionalization was done with laboratory fabricated self-cure acrylic (Pyrax Polymers, Roorkee, India) crowns [Figure 4]. Provisional was relieved from occlusion.

Appropriate antibiotic and analgesic were prescribed, and standard postoperative instructions were given to the patient. After 3 months, provisionals were removed and impression was made with closed tray technique using light body and putty polyvinyl siloxane rubber base material (Aquasil, Dentsply, Surrey, UK). Impression was sent to the laboratory for fabrication of porcelain fused to metal (PFM) bridge. A 3-unit PFM bridge was fabricated and cemented to the abutments [Figure 5]. Follow-up was done after 3, 6, and 12 month's interval.



Figure 2: Atraumatic extraction of teeth



Figure 3: Immediately placed implant with abutments



Figure 4: Provisional prosthesis



Figure 5: Final prosthesis

DISCUSSION

In the modern era, immediate implant concept is gaining popularity for replacing missing teeth, especially when anterior teeth are missing. Krump and Barnett reported high success rates with dental implants placed at the time of extraction.^[8] Evidence has shown that immediate implant placement presents more advantages as compared to delayed implant insertion, which are

implants in fresh extraction sites can be placed in the same location as the extracted tooth thereby minimizing the need for angled abutments, osseointegration is more favorable, the bony receptors are preserved by preventing atrophy of the alveolar ridge thereby preventing recession of the mucosal and gingival tissues, immediate placement of implants keeps contaminants away from the extraction socket, waiting times for primary healing of the soft tissues, and regeneration of the osseous structure are eliminated, immediate restorations can be provided for better esthetics. Elias and Sheiham carried out a review of available literature and found that, in general, patients were more willing for replacement of missing anterior tooth than a posterior tooth, and they rated esthetics above function in their priority for replacement of tooth.^[9]

Immediately placed and immediate loading implants are more predictable and successful than before,^[10] however, this approach cannot be applied to every immediate implant patient. In comparison to conventional implant treatment, the immediate loading procedure requires more chair-side time at the time of implant placement for both the restorative dentist and the patient. Careful patient screening and selection are required when an immediate implant placement with immediate loading procedure is a treatment consideration. The ideal state for immediately loaded implants would include adequate bone quality (D2 or D3 bone), screw-shaped implants, rough implant surface, and minimum implant length of 10 mm, adequate primary stability and avoidance of lateral forces.^[7] Primary stability of immediately placed implant seems to be the most important factor in immediate loading.

In the present report, primary stability (45 NCm) was achieved by extending osteotomy 3 mm beyond the apex of socket and by selecting width of implant that closely matches the width of extraction socket.

Attard and Zarb carried out a review and concluded that the success of early loading implants may not be compromised by placement in fresh extraction sockets as long as history of marginal periodontitis is avoided,^[11] while Quirynen *et al.* concluded that the incidence of implant failure is significantly higher when combining immediate implant insertion with immediate loading.^[12] Ferrara *et al.* conducted a study combining immediate placement and early loading of 33 implants and they found satisfactory esthetic and functional results from patient's point of view.^[13]

In the present report after completion of treatment excellent esthetic rehabilitation was observed and patient was very satisfied with the outcome of treatment.

CONCLUSIONS

Based on the outcomes of the present report and short review of the literature, it can be concluded that immediate implant placement with immediate loading may be a viable treatment option for cases requiring earliest restoration of teeth to be extracted. However, this approach is considered highly technique sensitive and requires expert dental implant team for its execution. Careful selection of cases, proper treatment plan and follow-up of surgical and prosthetic protocols are the keys to success.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Meyer MS, Joshipura K, Giovannucci E, Michaud DS. A review of the relationship between tooth loss, periodontal disease, and cancer. *Cancer Causes Control* 2008;19:895-907.
- Desvarieux M, Demmer RT, Rundek T, Boden-Albala B, Jacobs DR Jr, Papapanou PN, *et al.* Relationship between periodontal disease, tooth loss, and carotid artery plaque: The oral infections and vascular disease epidemiology study (INVEST). *Stroke* 2003;34:2120-5.
- Anil S, Preethanath RS, AlMoharib HS, Kamath KP, Anand PS. Impact of osteoporosis and its treatment on oral health. *Am J Med Sci* 2013;346:396-401.
- Craddock HL. Consequences of tooth loss: 1. The patient perspective – Aesthetic and functional implications. *Dent Update* 2009;36:616-9.
- Schropp L, Isidor F. Timing of implant placement relative to tooth extraction. *J Oral Rehabil* 2008;35 Suppl 1:33-43.
- Singh A, Gupta A, Yadav A, Chaturvedi TP, Bhatnagar A, Singh BP. Immediate placement of implant in fresh extraction socket with early loading. *Contemp Clin Dent* 2012;3 Suppl 2:S219-22.
- Vidyadharan A, Hanawa Y, Godfrey S, Resmi PG. Immediate implants and immediate loading in full arch maxilla and mandible of a bruxer – A case report. *IOSR J Dent Med Sci* 2014;13:62-7.
- Krump JL, Barnett BG. The immediate implant: A treatment alternative. *Int J Oral Maxillofac Implants* 1991;6:19-23.
- Elias AC, Sheiham A. The relationship between satisfaction with mouth and number and position of teeth. *J Oral Rehabil* 1998;25:649-61.
- Del Fabbro M, Testori T, Francetti L, Taschieri S, Weinstein R. Systematic review of survival rates for immediately loaded dental implants. *Int J Periodontics Restorative Dent* 2006;26:249-63.
- Attard NJ, Zarb GA. Immediate and early implant loading protocols: A literature review of clinical studies. *J Prosthet Dent* 2005;94:242-58.
- Quiryryn M, Van Assche N, Botticelli D, Berglundh T. How does the timing of implant placement to extraction affect outcome? *Int J Oral Maxillofac Implants* 2007;22 Suppl 1:203-23.
- Ferrara A, Galli C, Mauro G, Macaluso GM. Immediate provisional restoration of postextraction implants for maxillary single-tooth replacement. *Int J Periodontics Restorative Dent* 2006;26:371-7.