Flapless Surgery Followed by Immediate Loading of Implant: A Blissful Combination of New Era

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Esthetic challenges are inevitable during placement of the implant in the maxillary anterior region. This is because of the fact that tooth loss leads to bone resorption and collapse of gingival architecture, which eventually leads to compromise in esthetics and inadequacy of bone for implant placement. There are two established methods of implant placement. One method involves placement of the implant after reflecting the mucoperiosteal flap and another one without the flap. Conventionally, implants are allowed to osseointegrate for a period of 3-5 months before the commencement of prosthetic phase.¹ However, nowadays, immediate loading of implants with the flapless approach is gaining popularity as the flapless approach is having a lot of merits. The successful placement of an implant for immediate loading and its provisional restoration requires the careful consideration of many clinical entities and treatment steps. It is critical to understand about the factors which can be controlled and which cannot be controlled. A flapless, immediate procedure when done successfully provides a viable treatment option for patients as it reduces treatment time and leads to enhanced esthetic outcomes. Our challenge is to provide this service without compromising the long-term result. This case report describes a simple procedure of replacing a missing tooth by flapless surgery followed by immediate loading of the implant.

Keywords: Flapless surgery, implant, prosthesis

INTRODUCTION

Loss of tooth in the esthetic zone is a traumatic experience. According to the traditional protocols, 3-4 months of healing period are required for the consolidation of the extraction socket.¹ Taking into account the prosthetic treatment, patients frequently are required to wait up to 6 months for replacement of a lost tooth. The two-stage surgical procedure for implant placement with delayed implant loading has been the most documented approach to implant therapy. Similar results have been reported with the one-stage surgical procedure. The adoption of immediate loading protocol delivers obvious benefits to the patient when compared to conventional implant treatment.

Among these are the reduction of treatment time and discomfort, no need for a second surgery to uncover implants in case of submerged healing, and no need to use a removable prosthesis to avoid temporary periods without teeth.² The reduced treatment time achieved with immediate early loading is an obvious advantage for the patient. Nowadays, the flapless surgery followed by immediate loading is becoming more popular. Decreasing patient discomfort and reducing treatment time, while achieving high predictability and an excellent esthetic outcome, are the main goals of this treatment procedure.³

CASE REPORT

A 33-year-old, apparently healthy male patient reported to the Department of Prosthodontics, with a chief complaint of missing an anterior tooth. Various treatment plans were presented to the patient appropriate to his needs and preferences for fixed rehabilitation. Treatment options discussed included implant-supported restoration as well as a tooth-supported prosthesis. After discussing the options, the treatment modality of an implant-supported prosthesis was decided on (Figure 1).

Intraoral examination revealed missing 21, which was lost six months back following trauma. All the criteria for flapless surgery followed by immediate loading of the implant were satisfied. These criteria for flapless surgery include: (1) Presence of adequate keratinized tissue and (2) Presence of...
increased bone width (at least 4.5 mm). One disadvantage of the procedure was that it was difficult to ensure that the implant was positioned in the center of crestal bone as visibility was an apparent challenge (Figure 2).

The requirements of immediate loading are (1) good quality (Types I or II) bone; (2) possibility of placing an implant that is 12-16 mm long; (3) Keratinized soft tissue which is adequate in amount; (4) the ability to protect the healing implants from excessive occlusal forces; and (5) Primary stability of 45 Ncm at the time of implant placement.

Maxillary and mandibular diagnostic impressions were made in irreversible hydrocolloid impression material. The impressions were poured in Type III dental stone, and the cast was duplicated for bone mapping. One pair of the cast was used for diagnostic mounting. Digital panoramic and periapical radiographs were used to evaluate the implant site. Radiographs were analyzed for any bone deformities, retained root stumps, or any other pathology. Radiographs and bone mapping were employed in the selection of the size of implants (Figure 3).

Bone mapping was done to assess the bone width, ridge, contour, and soft tissue thickness. In the middle of the edentulous area, a line was drawn. An acrylic stent was fabricated, and three holes were drilled on buccal and lingual aspects of the edentulous area corresponding to the line on the cast which will have equal distance from the crest of the ridge both buccally as well as lingually or palatally. The cast was sectioned along the line. The stent was disinfected in betadine solution. The area was anesthetized by local infiltration using 2% lignocaine with adrenaline. The stent was tried in patient’s mouth. Endodontic file with rubber stops was pierced through the hole until it contacted the bone while the stent was in place. The file was removed and transferred to the sectioned cast in the cross-sectional area of the ridge. The procedure was repeated for other points so that when all the points are connected the outline of the ridge contour and thickness of the soft tissue were obtained (Figure 4).

The stent was fabricated on the sectioned cast following bone mapping. The favorable area in the ridge contour of the sectioned cast is drilled corresponding to the pilot drill insertion. The sections were kept in position and metal rod of 2 mm (equivalent to pilot drill) diameter is secured in the drilled area. The rod was stabilized with wax. The metallic sleeve was put over the rod, which acts as a guide during drilling. The auto polymerizing acrylic resin was adapted over the area including one tooth on the both sides of the edentulous area. The stent was kept in disinfectant solution for minimum of 12 h before surgery. Routine blood investigation was carried out to rule out any kind of systemic abnormalities. Titanium root form implants of dimension 3.3 mm × 16 mm were selected based on bone mapping and radiographs (Figure 5).
The routine presurgical protocol was strictly followed for the patient. Draping, scrubbing with betadine solution was done extraorally. The patient was made to rinse the mouth with 0.2% chlorhexidine mouthwash to reduce the oral microbial count. The areas were anesthetized by local infiltration using 2% lignocaine with 1:200000 adrenaline. Adequate anesthesia was ensured by subjective and objective evaluation. After marking the site using a surgical stent, the circular bit of tissue was removed using no. 15 BP blade. Initial penetration through cortical bone was achieved with round bur. Incremental drilling was done using progressively larger drill sizes starting from 2.5 mm. A recommended drill speed of 1000 rpm was selected for all drills. The preparation was done carefully progressing over 1 mm every 5 s under copious saline irrigation. The depth gauge was used intermittently to ensure the required depth. Once the required depth of the osteotomy was achieved, the implant was mounted on a carrier and was placed onto the prepared site. It was then slowly driven to its final position using a torque wrench. An implant level impression was made using an open tray impression post. An implant analog was attached, and the cast was poured. The straight abutment was then prepared on the cast to achieve adequate clearance. A metal-ceramic restoration was fabricated over the abutment. The abutment was then removed from the analog and was attached to the implant by fastening abutment screw. The metal-ceramic restoration was cemented on the abutment using glass ionomer cement (Figure 6).

**DISCUSSION**

Patients lose teeth partially or completely because of multiple factors such as dental caries, periodontal disease, and accidental trauma. Replacement of missing teeth is important for the patient’s general and oral health as well as for his social well-being. Over the last few decades, the utilization of bone-anchored dental implants has become an established treatment method in the replacement of missing teeth. In the conventional method, implant placement is done after raising the flap, and prosthetic phase is begun after 3-6 months. However, nowadays, the flapless surgery and immediate loading protocol are gaining popularity as it’s a faster technique and post-operative complication is comparatively less due to the fact that periosteal blood supply is not compromised. Leaving the periosteum intact on the facial and palatal/lingual aspects of the ridge maintains a better blood supply to the site, reducing the likelihood of resorption. In addition to preservation of blood circulation, flapless implant surgery maintains the soft tissue architecture and hard tissue volume at the site, decreases the surgical time and accelerates recuperation. It reduces patient morbidity, allowing the patient to resume normal oral hygiene procedures immediately. Furthermore, there is no need of any sutures after implant surgery when the flapless technique is employed which seems to be patient friendly. Moreover, the patient is obtaining the prosthesis soon after implant surgery which is considered as the major advantage of the immediate loading technique. Always primary stability of 45 Ncm at the time of implant placement is the minimum requirement for implant to be immediately loaded.

**CONCLUSION**

This article describes a case report in which anterior missing tooth is restored by the implant-supported prosthesis. In this case, implant placement is done by the flapless approach and immediate loading of the implant was carried out. The flapless approach is having certain advantages such as maintaining better blood supply to site, reduced likelihood of resorption, maintains the soft tissue architecture and hard tissue volume at the site, decreases the surgical time, and accelerates recuperation. Whenever primary stability of 45 Ncm can be achieved, the implant can be loaded immediately which helps the patient to obtain prosthesis soon. Anyway, flapless technique followed by immediate loading protocol is a fabulous combination if patient selection is done properly.
REFERENCES


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