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Immediate Loading of Single Implant in the Aesthetic Zone: A Case Report

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Abstract

An implant-supported restoration in the anterior zone must produce the best possible aesthetic outcome. Providing rapid interim restorations after implant surgery has been suggested as a preferable course of therapy in the aesthetic zone. Following implant implantation, a well-contoured interim restoration reduces alterations to the hard and soft tissues surrounding the implant. The aesthetic result and, thus, patient satisfaction may be improved as a result. To get the desired outcome, several prosthetic and surgical components must be properly designed and carried out. This case report describes the immediate loading of a single implant in the aesthetic zone.

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1. INTRODUCTION

In recent years, implant treatment has been seen to be the best option for replacing missing teeth, especially in the anterior region. Osteointegration is a crucial prerequisite for implant success. Dental implant restorations should have surrounding soft tissues that mimic that of natural teeth. Inappropriately formed tissues and restorations might result in unpleasant effects due to inflammation and inadequate access to oral hygiene.¹ A well-contoured restoration with a natural gingival contour that complements the surrounding teeth is essential for both aesthetic and functional implant treatment.^{2,3}

The placement of an interim restoration as soon as the fixture is inserted (within 48-72 hours after surgery) is surely an aesthetic and functional benefit to the patient, who can avoid wearing uncomfortable removable dentures during the healing period.^{4,5} Immediate prosthetic loading reduces the duration of treatment. Lastly, the gingival tissues benefit from the insertion of an immediate interim restoration since they may be quickly molded around it.⁶

In this case report immediate loading of single anterior implant was done using screw-retained interim restoration.

2. CASE PRESENTATION

A healthy 23-year-old male patient reported to the department of Prosthodontics, with a chief complaint of missing maxillary right front tooth. Clinical examination revealed missing maxillary right lateral incisor, fractured teeth no. 11, 13 and 21, root canal treated teeth no. 11 and 13 (Figure 2). A cone beam computed tomography (CBCT) scan was performed to evaluate the bone at the missing incisor site. Rehabilitation of the missing incisor with a dental implant was decided upon as the treatment of choice.



Figure 1: Pre-operative intraoral view showing missing and fractured teeth (A) Frontal view on maximum intercuspation showing missing lateral incisor and fractured teeth, (B) Occlusal view.

3. CLINICAL PROCEDURE

Prior to surgery, the patient was instructed to rinse with 0.2% chlorhexidine for one minute. A 5% povidone-iodine solution was used to disinfect the perioral skin. The surgical procedure was performed under local anaesthesia (2 % lignocaine with 1:80,000 adrenaline).

To gain access, crestal incisions were made, and intrasulcular incisions were made on the labial surfaces of adjacent teeth in addition to releasing incisions. A full thickness mucoperiosteal flap was raised and implant (3.5x13mm, Osstem implant TS III, Osstem Implant Co., Seoul, Korea) placement was performed at the lateral incisor site (Figure 2,3). The implant stability quotient was tested which showed a value of 92 (Figure 4).



Figure 2: Flap elevation



Figure 3: Implant placement



Figure 4: ISQ:92

The temporary abutment was positioned at the surgical site following the implant insertion. To fabricate an interim restoration, composite resin (shade A2; Spectrum, Dentsply) was incrementally built up over and around the temporary abutment

(Figure 5). Immediate post-operative radiograph and extraoral photographs were taken (Figure 6,7).



Figure 5: Screw-retained interim implant restoration



Figure 6: Immediate post-operative radiograph



Figure 7: Extraoral picture following immediate loading

After 6 months, tooth preparation was done for root canal treated teeth and implant impressions were made using a closed tray technique to fabricate the definitive implant prosthesis and full crows. Final layered zirconia crowns were then delivered (Figure 8,9).



Figure 8: Final implant prosthesis



Figure 9: Pre-operative and post-operative extraoral picture of the patient

4. DISCUSSION

Marginal soft tissue attachment and osseointegration are attained, respectively, via hard and soft tissue healing surrounding the implant. It is believed that soft tissue adaptation plays a major role in creating a physical barrier that prevents microorganisms and contaminated materials of the oral cavity from penetrating the underlying bone. Additionally, the long-term aesthetic results of implant therapy are significantly impacted by a stable peri-implant soft tissue attachment in the presence of bone support. This attachment is also crucial for obtaining and preserving the appropriate soft tissue contour surrounding dental implants.⁷

The following variables affect the final result of aesthetics: three-dimensional implant location; soft tissue profile; papilla height and symmetry; and any risk factors that are specific to the patient.^{1,8,9} Gingival contours that are aesthetically pleasing are consequently difficult to achieve, especially when it comes to appropriate interproximal papilla height. Therefore the interim restoration stage is crucial. Priest believes that the most important and prolonged stage of restorative implant treatment is the provisional phase.¹⁰

Benefits of immediate loading include prompt restoration of function, avoidance of second-stage surgery, less treatment time and stress, patient benefits in terms of appearance and psychology. However, the stresses supplied to the system during the early healing phase must be regulated and must not cause micromotions to achieve a proper osseointegration. The existence of micromovements at the interface between the implant and bone can influence osseointegration and bone healing, which can cause the implant to mobilize and fail.¹¹

6. CONCLUSION

Immediate loading of dental implants in anterior sites may be a safe and reliable treatment option for dental rehabilitation. For immediate loading to be effective proper case selection and patient compliance are essential.

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