



Management of Lingual Jumping Distance during Immediate Implant Placement with Bioactive Alloplast - A Case Report

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Abstract

Immediate dental implant is one of the most accepted treatment options for the rehabilitation of missing teeth. One drawback of immediate implant, however, is the residual space that remains between the implant and wall of the socket, called the jumping distance, which can lead to bone resorption as well as formation of a bony defect, thus, decreasing the implant stability. When this jumping distance is more than 2 mm, use of bone grafts is recommended. Addition of GTR membrane along with the implant and bone graft adds to the success of implant. Hence two immediate implants were placed in the lower posterior region along with the bioactive alloplastic graft (Novabone Dental Putty, NovaBone Products Pvt. Ltd., India). The graft was stabilized using bioresorbable guided bone regeneration membrane (Healiguide, Advance Biotec Products, Chennai, India). This was followed by placing interrupted sutures to achieve primary closure. Thus, the purpose of this article is to present the technique of rehabilitating missing molars in an effective manner through immediate implants along with the alloplastic graft and GTR membrane.

Keywords: Immediate Implant; Alloplast; Jumping Distance; Guided Bone Regeneration

Introduction

Implants in dentistry have given a new lease of life to patients who desire fixed replacement of their missing teeth. Similarly, protocols of placing implants have also undergone changes with initial procedure involving a two-step approach as described by P.I. Branemark [1]. Immediate implant placement in an extraction socket

was first described by Schulte and Heimke in 1976 [2]. Although immediate implant protocol drastically reduces the time required from implant placement to rehabilitation, some cases present with complications such as suboptimal primary stability, gingival recession, inadequate bands of keratinized tissue after healing and unacceptable esthetic outcomes [3].

One of the most common surgical complications in posterior immediate implant placement, however, is the presence of remaining space between the socket walls and implant body. This occurs due to differences in the socket anatomy and the implant design. This residual space is termed as jumping distance. It has been observed that increased jumping distance can culminate into bony resorption and defect, thus further compromising the implant success rate. If the jumping distance exceeds 2mm then grafting procedures are required [4].

This article presents a case of immediate implant placement with management of lingual jumping distance with bioactive alloplast and GBR membrane.

Case Report

A 28-year-old patient reported to the department of prosthodontics, crown and bridge, maxillofacial prosthodontics and oral implantology, I.T.S. Dental College, Hospital and Research Centre, Greater Noida (U.P) with a chief complain of inability to chew from the lower right back tooth region. Upon clinical evaluation it was observed that teeth number 46 and 47 were endodontically treated with a remaining crown structure of < 3mm in height (Figure 1).



Figure 1: Pre-op intraoral view.

Upon radiological evaluation the endodontic treatment was also found to be faulty with the presence of a periapical radiolucency along with internal resorption of the roots (Figure 2).

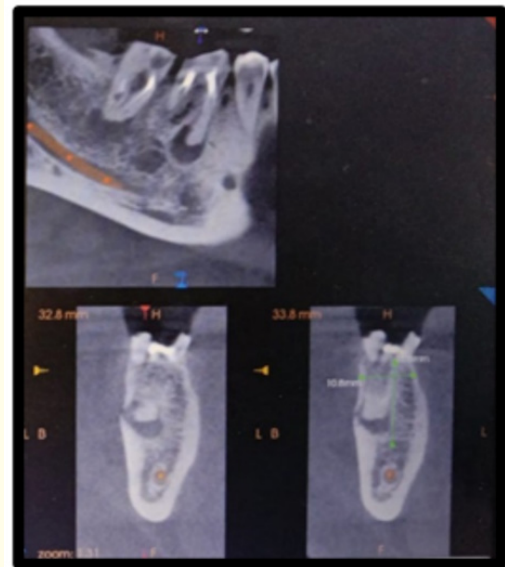


Figure 2: Radiographic evaluation.

Thus, it was decided to extract the teeth and place immediate implants in the socket. The patient was explained about the procedure and consent was obtained.

Surgical procedure

Patient was instructed to begin with an antibiotic coverage (Augmentin 650mg duo, Glaxo SmithKline Pharmaceuticals Ltd., India). The surgical procedure began with the administration of inferior alveolar nerve block using 1.5ml of 2% Lignocaine with 1:100,000 adrenaline (Lox 2%, Neon Laboratories, Mumbai, India). Following local anesthesia, the concerned teeth were extracted atraumatically, ensuring preservation of interradicular bone (Figure 3).

Extraction sockets were then debrided using a curette and irrigated with a mixture of 0.2% chlorhexidine gluconate (Chitosan hydrochloride, Mahtani Chitosan Pvt. Ltd., India) and normal saline.

After ensuring removal of all granulation tissues, sequential osteotomy was performed using conventional drills (Adin Dental Implant System Ltd., Israel) and dental implants of 5mm X 10 mm and 4.2 mm X 11.5mm were placed in sockets of tooth number 46



Figure 3: Post extraction sockets.

and 47, respectively. An optimal insertion torque of 45 Ncm was achieved using a torque ratchet. A lingual jumping distance of 4mm w.r.t. 46 and 3mm w.r.t. 47 was observed post implant placement. This increased jumping distance might had led to complications in future thus it was grafted using bioactive alloplastic graft (Nova-bone Dental Putty, NovaBone Products Pvt. Ltd., India) (Figure 4a and b).



Figure 4a: Alloplast graft material.



Figure 4b: Alloplast graft material being placed.

The graft was stabilized using bioresorbable guided bone regeneration membrane (Healiguide, Advance Biotec Products, Chennai, India) (Figure 5) and interrupted sutures were placed to achieve primary closure. The patient was recalled after 1 week for suture removal.



Figure 5: GBR Membrane.

After 6 months for prosthetic rehabilitation phase was ensued. During the prosthetic rehabilitation process satisfactory contour

of the hard and soft tissue was observed which was further validated by intraoral peri apical radiographs taken during the prosthetic phase (Figure 6).



Figure 6: Radiograph showing healing of bone.

Screw retained prosthesis was delivered to the patient (Figure 7).

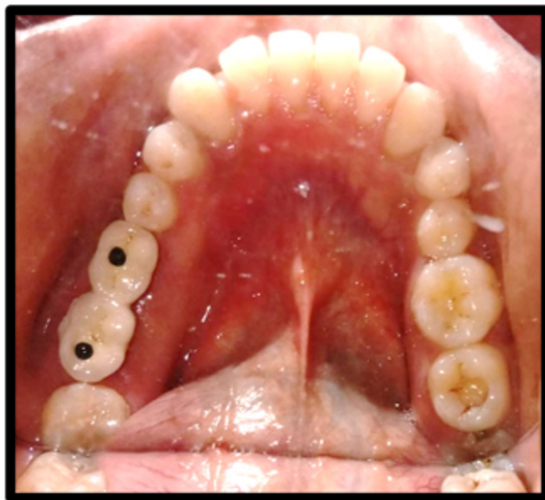


Figure 7: Final prosthesis in situ.

Discussion

Immediate implant protocol considerably reduced the amount of time and visits required for rehabilitation of missing teeth using implants. This protocol is further advantageous in preserving the soft tissue profile of patients, which would require multiple additional procedures when done using two-staged approach. One of the pitfalls of immediate implant placement especially in the posterior region is the size mismatch between extraction socket and the implant geometry. This gap or jumping distance is very crucial since there is no close apposition of implant in these sites.

According to Al-Sabbagh, *et al.* a jumping distance less than 2 mm is inconsequential with regards to implant stability [5]. However, when the jumping distance increases beyond 2 mm, the stability of the implant might be compromised thus required grafting procedures to be followed. These additional procedures help in maintaining the hard and soft tissue contours so that a more esthetic outcome can be achieved.

Alloplastic materials such as bioactive glasses have claimed to act by osteopromotion and/or osteoconduction. They have also found to produce faster bone formation when compared to hydroxyapatite. Hence, bioactive glass was chosen to graft the jumping distance in this particular case [6].

Conclusion

Immediate implant placement in conjunction with bioactive glass and bioresorbable GBR membrane can be conducive of long-term success of dental implants.

Conflict of Interest

None.

Funding Statement

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