



ORIGINAL RESEARCH PAPER

Dental Science

A NOVEL TECHNIQUE FOR FLAPLESS SOCKET PRESERVATION BY ICE CREAM CONE TECHNIQUE

KEY WORDS: flapless technique, socket preservation, ice cream cone approach.

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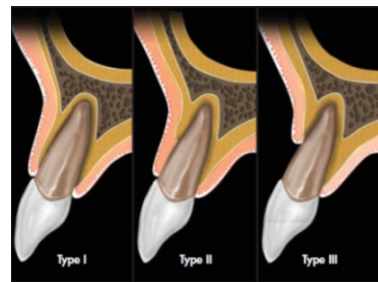
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ABSTRACT

After tooth extraction, the alveolar ridge will commonly decrease in volume and change morphologically. These changes are usually clinically significant and can make placement of a conventional bridge or an implant-supported crown difficult. If bone resorption is significant enough, then placement of an implant may become extremely challenging. Post extraction maintenance of the alveolar ridge minimizes residual ridge resorption and, thus, allows placement of an implant that satisfies esthetic and functional criteria. Recent advances in bone grafting materials and techniques allow the dentist to place implants in sites that were considered compromised in the past. This article focuses on the healing pattern of sockets, with and without the use of regenerative materials, and the rationale for preserving the dimensions of the extraction socket. Socket preservation procedure following tooth extraction will reduce the need for any further ridge augmentation technique prior to implant placement and will conserve the existing bone.

INTRODUCTION:

Nowadays the outcome of implant surgery is measured by the long-term esthetic and functional success and not by the survival rate. A correlation exists between the hard and soft tissues in order to assure esthetic outcomes in implant surgery. Significant changes in bone volume and morphology following tooth extraction, can make implant rehabilitation very difficult, as the time from extraction to implant placement increases. Van Der Weijden et al¹ demonstrated that the mean buccolingual dimensional change of a human extraction socket was approximately 4 mm if no preservation technique was performed. Other studies have shown that up to 50% of the horizontal bone can be lost within 12 months postextraction.²⁻⁴ The greatest change in ridge contour occurs during the first month after tooth extraction, which is both statistically and clinically significant. The mean ridge width decrease after 6 months is 3 to 5 mm.^{3,4} There is a general consensus that socket preservation techniques are beneficial in minimizing ridge shrinkage following extraction. Osseous augmentation and preservation for creating and maintaining bone volume for implants often involve the use of bone graft materials with or without barrier membranes. There are various techniques that have been suggested in several studies⁵; however, a gold standard as to the ideal graft material or whether a technique with or without barrier membranes should be followed has not yet been established.^{6,7} Among the various techniques employed, the "ice cream cone" technique has been advocated in type 2 extraction sockets due to its simplicity.⁸ Type 2 sockets are defined as those with the presence of soft tissue and a partially or completely missing buccal plate before and after tooth extraction. There is a general consensus that socket preservation techniques are beneficial in minimizing ridge shrinkage following extraction. Osseous augmentation and preservation for creating and maintaining bone volume for implants often involve the use of bone graft materials with or without barrier membranes. Among the various techniques employed, the "ice cream cone" technique has been advocated in type 2 extraction sockets due to its simplicity.



AIM:

The purpose of this pilot study was to measure the dimensional changes in type 2 sockets using the ice cream cone flapless grafting technique as described by Elian et al.

METHOD AND MATERIALS:

This pilot study was conducted in the Department of Periodontology, Rajarajeswari Dental College and Hospital, Bangalore. Consent was obtained from patients based on the Helsinki Declaration of 1975, as revised in 2000. Patient was a healthy nonsmoker, 27yrs of age diagnosed with aggressive periodontitis and hopeless prognosis with respect to maxillary right second premolar. As standard protocol for the study, periapical radiographs and orthopantomogram of the site was obtained both pre and postoperatively. The patient was premedicated with 2 g of amoxicillin 1 hour prior to extraction and the guided bone regeneration (GBR) procedure. The measured tooth sites comprised of maxillary right second premolar (15) that was removed atraumatically without flap elevation after the administration of local anesthesia. After tooth extraction the socket was curetted thoroughly to remove all soft tissue remnants before the placement of the membrane and bone graft material. The site was then grafted with a bone allograft (perio glass) and a resorbable collagen membrane (sybografTM plus) in combination with platelet rich fibrin (PRF). The collagen membrane was cut into an ice cream cone shape and inserted internally into the extraction socket, and bone allograft was placed. Two resorbable 4.0-chromic sutures (Ethicon, Johnson & Johnson) were used to suture

and secure the membrane over the site to prevent dislodgement or loss of the particulate bone graft material and blood clot during initial healing.

The patient was placed on antibiotic therapy (amoxicillin 500 mg three times a day) for 1 week. Patient was also instructed to rinse twice per day for 7 days with 0.12% chlorhexidine and were seen for follow-up care 1 week postoperatively. Radiographs were taken 3 months post healing for implant therapy evaluation. This evaluation was performed to assess adequate radiographic bone maturation and volume.

RESULTS:

The epithelium surrounding the tooth extraction sites grew over the blood clot with granulation tissue formation within 3 to 4 weeks, and the site healed uneventfully. There was adequate bone formation 3 months post treatment and did not require further bone augmentation. The patient has to be followed up for another 3 months to evaluate the site for implant placement.

DISCUSSION:

Augmentation of bone volume has been achieved using the GBR procedure. GBR is based on the principle that a barrier membrane is used for space maintenance over a defect, promoting the ingrowth of osteogenic cells and preventing migration of undesired cells from the overlying soft tissues into the wound.⁹ Protection of a blood clot in the defect, exclusion of gingival connective tissue, and provision of a secluded space into which osteogenic cells from the bone can migrate are essential for a successful outcome.¹⁰

This study evaluated the buccolingual dimension of the ridge following the ice cream cone technique as described by Elian et al, using a bioabsorbable membrane and allograft in combination with PRF. The outcome from this study demonstrated that the tested preservation technique resulted in smaller contour changes compared with nontreated extraction sites with type 2 sockets and flap elevation. Thus, the ice cream cone technique offers repair with technical ease and less soft tissue manipulation while allowing for secondary wound healing.

CONCLUSION:

This pilot study provides some information that the ice cream cone flapless technique is an easy approach that results in better horizontal regeneration of the buccal bone plate. The results have to be validated with still more study sites and long term follow up.

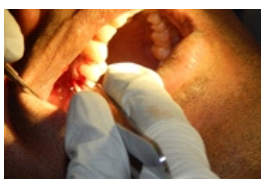
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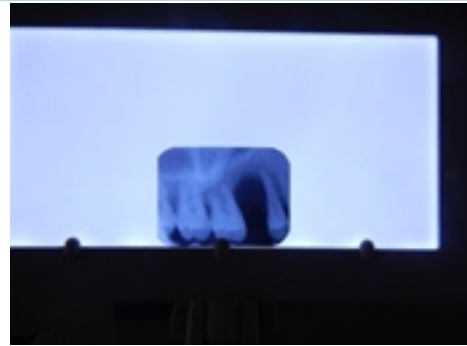
PRE-OPERATIVE



GBR MEMBRANE MADE INTO ICECREAM CONE IN SOCKET



BONE GRAFT WITH PRF PLACED



PRE OPERATIVE IOPAR



3 MONTHS POST OPERATIVE IOPAR

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