SOCKET PRESERVATION WITH COLLAPLUGS: A CASE REPORT

A Case Report

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ABSTRACT

Tooth extraction whether traumatic or atraumatic, results in alveolar bone loss both in height and width. An average of 40-60% of original height and width is expected to be lost after extraction, most of which takes place within the first year. Socket Preservation is a procedure in which graft material or scaffold is placed in the socket of an extracted tooth at the time of extraction to preserve the alveolar ridge. In this case report, it is described how the socket of the upper molar teeth is preserved with collaplugs. PRF plugs also maintains the soft tissue contour of the ridge.

Key Words: Extraction, Socket preservation, resorption

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INTRODUCTION:

Soft tissue contour depends on the underlying bone anatomy, following tooth extraction, sockets undergoes a remodeling process that influences the implant rehabilitation treatment of the edentulous areas. 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. The aim is to preserve the original bone dimensional contours by limiting the normal post extraction resorptive process. The rate of reduction of residual alveolar ridges is greater in mandibular (0.4mm/year) than in maxillary arches (0.1mm/year), 1mm in vertical bone 2-2.5mm in horizontal bone resorption corresponding to 2mm soft tissue recession.

Socket Preservation differs from Ridge Augmentation; in Socket Preservation, the graft or scaffold is placed inside the tooth socket immediately after extraction, whereas the Ridge Augmentation grafting procedure is done to bring back the lost bone after the bone has resorbed and there is insufficient ridge height or width for further treatment procedure.

INDICATIONS[1]:

1. Immediately after tooth removal in extraction socket site prevents immediate bone resorption.
2. Preparation of healthy soft and hard tissue bed for future dental procedures
3. When immediate implant placement is contraindicated and delayed implant placement is more appropriate, especially in esthetic cases.
4. Maintains contour and integrity of the socket.

Without socket preservation, residual bones could loose volume resulting in loss of facial vertical and horizontal dimension and changes in facial soft tissues aesthetics.

CONTRAINDICATIONS:

1. Severe and uncontrolled diabetic patients
2. Patients undergoing radiation therapy on the oral cavity
3. Infected extraction site with acute condition
4. Patients with severe gum disease
5. Patients with systemic diseases contraindicating placement of scaffolds
6. Heavy smokers
7. Deciduous teeth socket
8. Patients having allergic reaction to synthetic materials.

CLINICAL ASSESSMENT:

1. Careful radiographic evaluation.
2. Evaluation may be enhanced using Cone beam CT.
3. Decision making on type of extraction required.
4. Bone sounding, confirm the condition of labial, buccal and palatal bone height.
5. Quality and quantity of gingival tissues around the tooth should be evaluated to access the need for connective tissue grafting.

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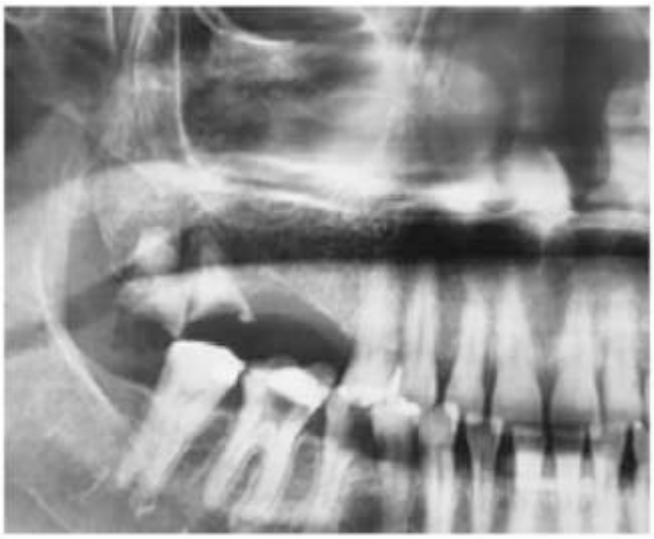
Keys to successful Extraction-socket Grafting According to Dr. Carl Misch, some keys to successful bone grafting of extraction sites include[1]:

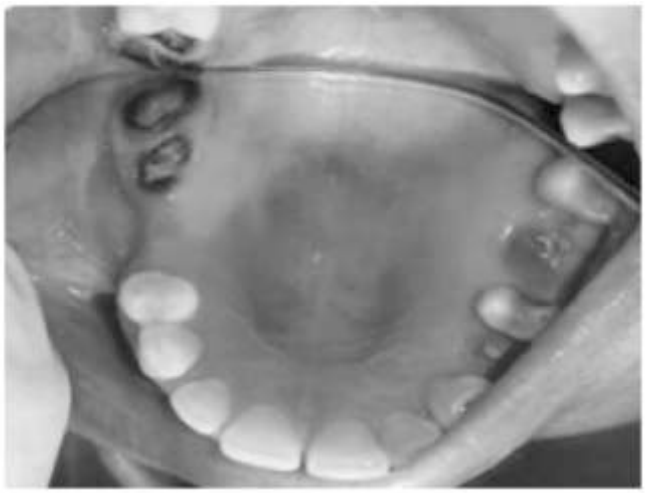
1. Atraumatic tooth removal.
2. An evaluation of the remaining walls of bone following the extraction, and evaluation of the size of the defect.
3. Asepsis and complete removal of granulomatous tissue.
4. Ensuring adequate blood supply to the graft site.
5. Graft containment and soft tissue closure.
6. Choice of an appropriate graft material.
7. Ensuring adequate time for healing.

CLINICAL CASE:

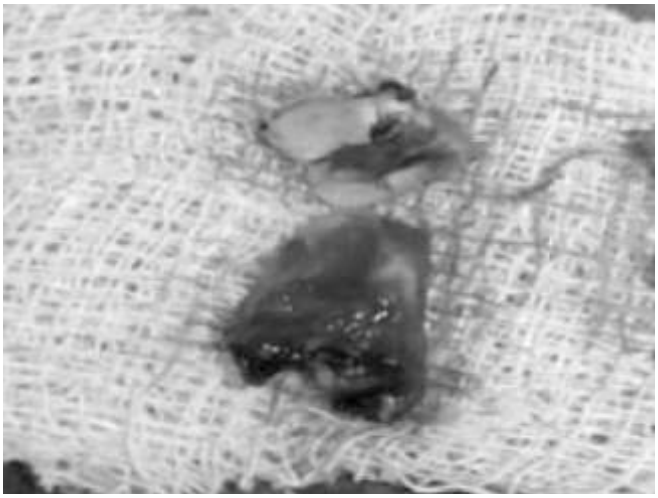
A 57 year old patient male with a noncontributory medical history, presented to our clinic with chief complaint of decayed teeth and difficulty in chewing in upper right back teeth region since 5 years. The tooth was deemed hopeless and referred for extraction with socket preservation for future dental implant placement. After tooth was atraumatically removed with forceps technique, the extraction socket was filled with collaplugs. Primary closure was achieved. Follow is taken at one week and 4 months.



Preoperative Radiograph

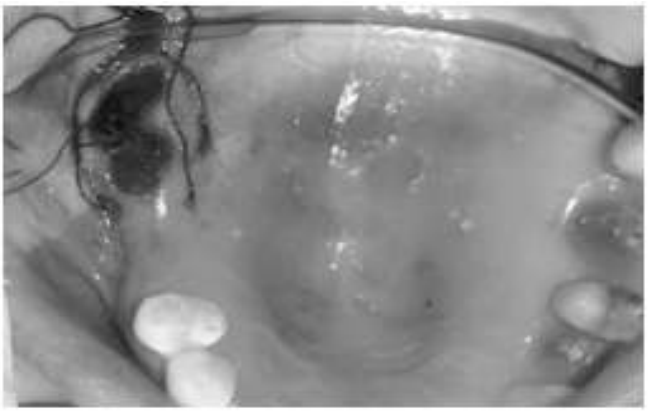


Preoperative Clinically

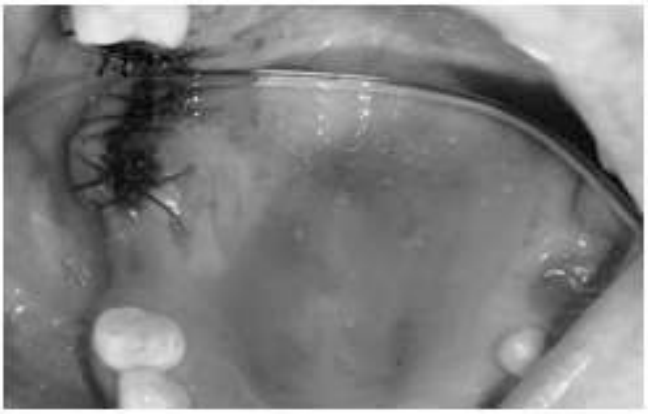


Extracted Root pieces

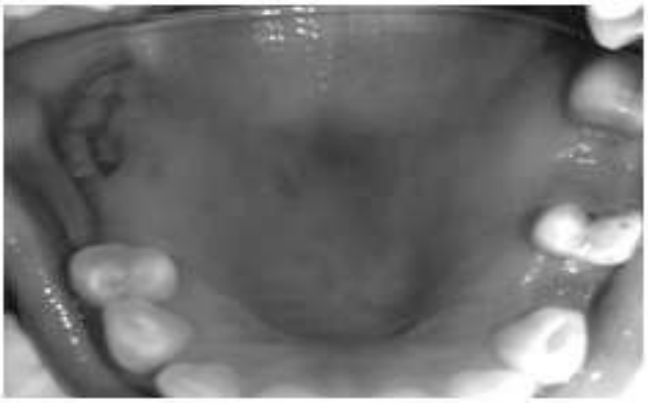
Collaplug



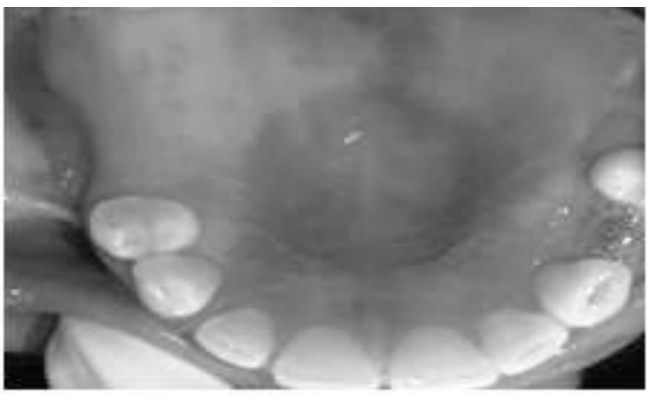
Presuturing and collaplug placed



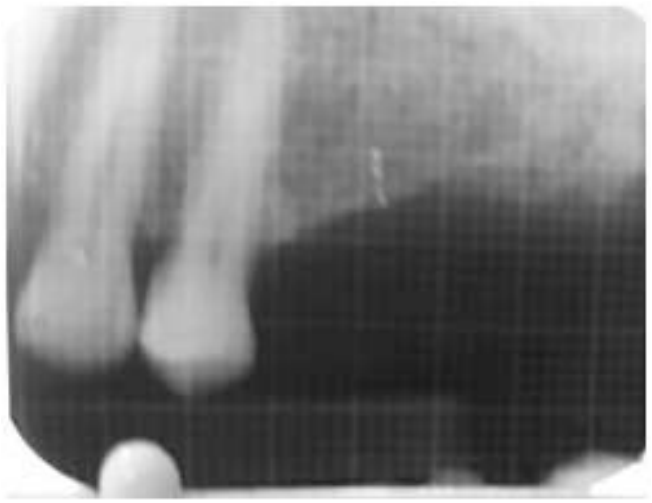
Suturing



One week follow up



4 Month follow up



4 Month follow up Radiographically

Discussion:

The resorption of the alveolar ridge following tooth extraction is a physiological phenomenom. The preservation of the morphology of the extraction socket has become critical due to increase bone volume in order to accommodate implant and thus improve implant stability. Bone graft materials have played an important role in regenerative dentistry for many years.[2]

There are three distinct properties of graft materials: Osteogenecity (ability to directly deposit bone by the viable osteoblasts present in the bone graft), osteoconductivity (ability of the graft to act as passive scaffolding that supports new bone formation and ingrowth of capillaries), and osteoinductivity (ability of differentiating factors that facilitate the recruitment and differentiation of mesenchymal stem cells and specifically induce them to form osteoblasts which deposit the new bone).

Among these the focus is on the osteoinductive property. The osteoinductive bone grafts contain the growth factors responsible for these stimuli, which are of the family of bone morphogenetic proteins, transforming growth factors, insulin-like growth factor, platelet derived growth factor and epidermal derived growth factor.

Today's concept in tooth extraction shall routinely consider maintainence of the existing extraction socket dimensions with some sort of bone replacement material. This procedure has been called ARP or preservation.

Traditionally, ARP includes the use of particulate

alloplasts, xenografts, autografts, and membranes manufactured from various materials, including that are bioabsorbable or nonresorbable, naturally derived or synthetic. Most of these materials have been shown not only to be osteoconductive but also many of them are associated with a number of disadvantages, such as increased overall cost, the requirement for a second surgical site and the use of anima-derived products.[5]

Till date, the rich and readily available autologous sourse of growth factors is from platelets derived from the peripheral blood. They contain a number of different growth factors which are released into the tissue after injury. These include TGF-@, PDGF, IGF, AND FGF, which act as a differential factors on regenerating tissues. The PDGF is angiogenic and is known to stimulate the reproduction and chemotaxis of connective tissue cells and matrix deposition.[3]

A different approach for socket preservation is the use of bioabsorbable collagen. Collagen is the most abundant extracelluar matrix and component of connective tissue. The collagen used in dental procedures is readily isolated and purified from various animal species by enzyme treatment collagen Type 1 is the main organic component that is originally secreted by osteoblasts, which then becomes mineralized at a later stage of bone development.[6] Collagen has been actively investigated as a favorable artificial environment for bone in-growth. It was shown that endothelial cells adhere, spread, and proliferate on a collagen membrane. Collaplug, an absorbable collagen sponge, consists of 85 to 95% of bovine collagen type I and 5-15% bovine collagen type III and has been used with great success. The sponge serves as a support to prevent the collapse of the surrounding soft tissue during the healing process. Hence the present study was to preserve the extraction socket with CollaPlug.[4]

In this case report, the post operative radiograph shows mature bone has formed in the extraction socket for implant placement.

CONCLUSION:

The socket preservation technique seems to show important results concerning bone volume conservation and favorable architecture of the alveolar ridge in order to obtain ideal functional and esthetic prosthesis after implant rehabilitations.

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