Socket preservation in the daily practice: A clinical case report

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oft tissue contour depends on the underlying bone anatomy, following tooth extraction, sockets undergo 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 extrac-tion resorptive process. The overall goal of this article is to provide the dental professional with valid tools in order to help them make a conscious decision considering the indications of this therapy and dependent on each clinical case.

Keywords: Extraction, socket preservation, implant, resorption process.

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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. Bone substitute in alveolar ridge preservation and prevention of additional bone grafting is highly supported and has a wide range of advantages. The socket preservation technique allows the placement of implants in sites that was considered compromised in the past. Following the conservative extraction procedure (Figure 1.2), a bone filler is placed in the empty socket with a cross or non-cross linked membrane (Figure 3) and closed partially (Figure 3) or totally by a flap (Figure 4); stimulate that a provisional preparation is sometimes mandatory in order to guide the healing process of surrounding tissues (Figure 5.6.7). It was demonstrated that following tooth extraction the buccal bone plate will undergo some modifications due to bone remodeling. In order to reduce the bone loss, several surgical techniques have been proposed. Nowadays it is still possible to minimize osseous deformities problems by carrying out the ridge preservation techniques in extraction sockets and using bone fillers materials with barrier membranes. Today the advanced wide range of bone grafting materials and collagen membranes guides us into taking in charge many compromised cases. It was noted that the resorption of bone ridge is faster during the first six months following extraction, therefore a conservative approach remains necessary. Many measures should be taken into consideration when conducting the socket preservation surgery such as: reducing the extraction trauma and limiting the flap elevation. It was found histologically that bone formation occurs over the surface of the implanted osteoconductive graft fillers. This article goes through the technical basis for socket preservation procedure and exposes its importance as an available treatment in order to prevent ridge atrophy and optimize esthetics in the anterior maxillary area.

Clinical Case: A 49-year-old female with a noncontributory medical history, presented to our clinic with a mobile tooth 21 and an apical absorption; the chief complaint was pressure in the upper anterior left area of the central incisor. Clinical examination showed tooth 21 mobile with gray coloration. Periapical radiograph examination revealed an apical resorption with an incomplete endodontic treatment (Figure 8). The tooth was deemed hopeless and referred for extraction with socket preservation for future dental implant placement.

After tooth was carefully removed with forceps technique (Figure 9), the extraction site was grafted with an osteoconductive bone graft (Figure 10, 11). A resorbable collagen membrane was placed on the buccal aspect of the extraction socket and sutured to the palatal flap to attempt a primary closure, with an exposed membrane left at the occlusal aspect of the extraction socket. A Temporary bridge was placed to guide the healing process and conserve the esthetic in the anterior region (Figure 12). After six months surgical re-entry during implant placement showed a good bony healing, that allowed the placement of a regular platform implant within the bone envelope (Figure 13), and achieved a good primary stability that allowed the placement of single piece, direct-to-fixture provision-al screw-retained restoration on site 21 in order to guide the healing process (Figure 14,15,16). A period of three months elapsed to permit osseointegration, afterwards the patient present for final impression (Figure 17,16), it was noted that the long axis of the implant correlated to the central fossa of the expected final restoration (Figure 19). The final restoration showed an ideal esthetic restoration with healthy surrounding soft tissues.

Discussion: The failure to preserving the anatomy of hard and soft tissues will result in esthetic failures and compromises the final results. Araujo mentioned in a paper published in 2009, the use of xenograft in socket preservation techniques will delay the socket healing but will help at the same time to conserving the anatomy. Xenografts are considered the most used bone fillers in the socket preservation procedures due to their osteoconductive matrix framework which enhances the growth of new bone around it, as their name suggests. Following tooth extraction the buccal plate formed especially by bundle bone will experience more resorption than lingual and palatal ones and is considered the first to be absorbed. Loss of vertical ridge height will also occur less than the horizontal one, reducing the

Figure 1: Preoperative situation, note the unaligned incisor edge of tooth 21 with the grey cervical lining. Figure 2: Clinical view showing a complete horizontal fracture of the crown of tooth 21. Figure 3: After conservative extraction of tooth 21, collagen membrane is placed inside the bony envelope. Note the intact socket bone walls. Figure 4: Xenograft (Bio os®) is placed inside the socket and covered by a collagen membrane sutured to the palatal flap and intentionally left exposed so as not to create a mucosal defect from flap advancement.
Figure 8: Periapical radiograph showing the resorbed apex of tooth 21. Figure 9: Clinical view after extraction of tooth 21, note the resorbed apex.

Figure 10: Intraoral view of the socket of tooth 21 after been filled with porous bovine bone mineral. Figure 11: Periapical radiograph showing the xenograft in place in socket of tooth 21. Figure 12: Temporary crowns prepared in order to guide the healing of the surrounding tissues. Figure 13: Implant placed six months after the healing. The figure shows successful preservation of the ridge and placement of a regular-platform implant. Figure 14: Temporary crowns placed on tooth 11 and a single piece, direct-to-fixture provisional screw-retained restoration on site 21 to guide the healing process.

Figure 15: Clinical view showing the healthy soft tissue surrounding the temporary crowns. Figure 16: Ideal histotype of the surrounding soft tissue ready for impressions. Figure 17, 18: Impression on the head of the implant simulating the surrounding soft tissues. Figure 19: Clinical presentation of the final esthetic result with the healthy surrounding soft tissues. The clinical crowns conserved the gingival architecture and met the patient’s esthetic demands.