

**BEAT WALLKAMM, SWITZERLAND**

## Preservation of alveolar bone in an extraction socket using Straumann® MembraGel in a flapless surgical procedure

**Introduction**

It is well known that tooth extraction results in a compromised alveolar ridge contour.<sup>1,2</sup> Due to this resorption process, the buccal bone contour is reduced about 50% after 3 month post-extraction<sup>3</sup>. It has been shown in animal models that placement of biomaterials into the extraction socket could compensate this resorption processed to a certain extent and promote bone (re)modeling<sup>4</sup>. Today, many different post extraction socket or ridge preservation procedures are applied which differ significantly in their surgical protocol<sup>5</sup>. This case report presents a new flapless socket preservation technique using a novel technology barrier membrane.

**Initial situation**

The patient (male, 28 years) had suffered a tooth trauma 12 years ago. He was in general good health and with a moderate oral hygiene. Tooth #22 had been replaced by a Straumann® Tapered Effect Implant (3.3 mm) 5 years ago. The clinical examination, as well as the X-ray, show the hopeless situation for tooth #21 (**Figs. 1–4**). At the time of surgery, the 3.3 mm implant had not yet been cleared by Straumann for placing an extension crown to replace the unrestorable tooth #21, the tooth had to be replaced by an implant as well. Therefore, the proposed treatment plan was careful tooth extraction followed by concurrent socket preservation



Fig. 1



Fig. 2



Fig. 3



Fig. 4

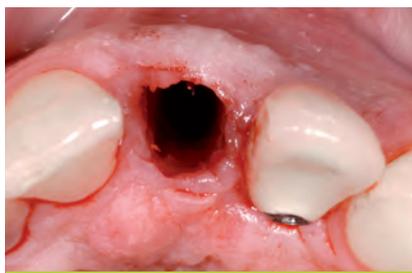


Fig. 5

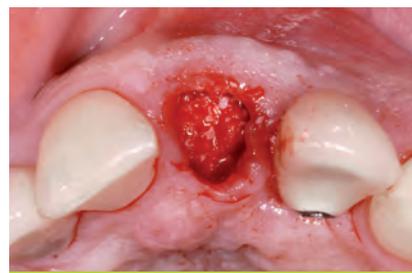


Fig. 6

in a flapless transgingival approach to preserve the soft tissue conditions, followed by delayed implant placement with a concurrent GBR procedure and a single crown as final restorative solution. The patient was informed of the difficult situation of the neighboring implants concerning papillary bone and soft tissue height.

**Surgical Procedure**

Preoperatively, an anti-inflammatory drug was given (Ibuprofen-Arginin 600 mg). The patient had to rinse with CHX 0.12% for 1 minute. The surgery was performed under local anesthesia (1.7 ml Articain 1:80,000). The tooth was then

extracted carefully with a periosteal elevator and forceps while preserving the buccal bone plate which could be evaluated by periodontal probing of the extraction socket afterwards (Fig. 5). The extraction socket was debrided in the most apical region with a surgical spoon, care was taken to preserve the periodontal fibers to ensure better blood supply. The socket was filled with bone graft substitute material without overbuilding the neighboring host bone in the crestal aspect (Fig. 6). Straumann® MembraGel was applied to completely cover the bone substitute material in all dimensions. Care was taken not to overfill the socket by staying slightly below the soft tissue height to allow subsequent horizontal granulation

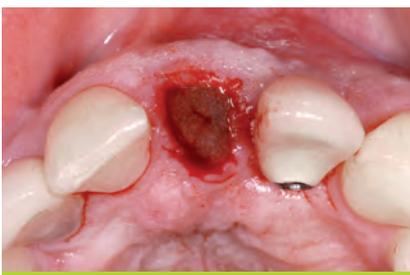


Fig. 7

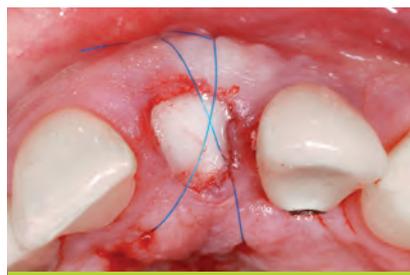


Fig. 8



Fig. 9



Fig. 10



Fig. 11



Fig. 12

(Fig. 7). In order to increase the stability of the membrane, a crossed external mattress suture was placed after the Straumann® MembraGel had solidified (Seralon® 6-0, Fig. 8).

### Post-OP

The patient was instructed to rinse twice daily with a disinfectant solution for one minute (CHX 0.12%). For post-surgical pain, analgesics were prescribed (Ibuprofen-Arginin 600 mg). Furthermore, the patient had to use a cooling bag for the first two days. No antibiotics were prescribed. He was advised not to touch the region, to avoid chewing at the surgical site and provided with a small provisional steel based prosthesis after extraction. Care was taken to ensure that the space between the prosthesis and the exposed membrane surface was sufficient to allow soft tissue granulation above the extraction socket site. Already at the time of suture removal 7 days post-OP, a significant granulation

could be observed (Fig. 9), complete wound closure could be achieved 21 days post-OP (Fig. 10). The further healing process was uneventful. At time of implant placement 10 weeks after extraction socket treatment, the patient presented healthy gingival conditions, the volume could be sufficiently preserved (Fig. 11). The Straumann® Roxolid® Bone Level Implant Ø 3.3 mm (SLActive® 10 mm) could be placed by means of raising a small flap with a minor GBR (the bone filling material was removed before insertion of the implant due to histological analysis, Fig. 12). After another 16 weeks the final crown was installed by means of a directly screw-retained metal ceramic crown (Figs. 13, 14). The clinical evaluation at two years post loading resulted in stable bone and peri-implant soft tissue conditions with a fully restored emergence profile and stable bony conditions (Figs. 15–17).



Fig. 13



Fig. 14



Fig. 15

## Conclusion

Straumann® MembraGel could be used successfully in the technique presented for flapless socket seal. The liquid application procedure for bone graft coverage facilitated the surgical workflow. The early post-surgical evaluation showed an excellent soft tissue response accompanied by early wound closure. The soft and hard tissue could be preserved satisfactorily facilitating the subsequent implant insertion procedure.



**References:** the complete list of references to this article can be viewed on: [www.straumann.com/targetref.pdf](http://www.straumann.com/targetref.pdf)



**Dr. med. dent. Beat H. Walkamm**

Specialist dentist for periodontology SSO (Swiss Society of Odontology). Since 1997 proprietor of a dental referral practice for oral surgery, implant dentistry and periodontology in Langenthal/Switzerland. Since 2004 Clinical Assistant Professor in the Structured Assistant Training Program in Periodontology at the Central Medical Clinic (ZMK) at the University of Bern/Switzerland. ITI speaker.



Fig. 16



Fig. 17