"The thickness of the buccal bone lamella is not important"

Bone resorption is minimised by filling the extraction socket with a bone replacement material and subsequent closure. Dr. Daniele Cardaropoli, Italy, has probed the impact of Ridge Preservation in a randomized clinical study. He considers the relative merits of the various techniques in this interview.

Dr. Cardaropoli, what was the most interesting finding from the clinical study in your view?

Dr. Cardaropoli: Ridge Preservation resulted in a volume maintenance that was found to be completely independent of whether the buccal bone wall was previously thick or thin. In sockets which had been filled with Geistlich Bio-Oss® Collagen and covered with Geistlich Bio-Gide®, we retained more than 90% of their horizontal volume instead of only 66% with spontaneous healing. As for bone height, only 0.5 mm was lost in the test group, compared to 1.5 mm with spontaneous healing. And as I said: this result did not correlate with the original thicknesses of the buccal lamellae.

Why is that a surprise?

Dr. Cardaropoli: A thin buccal bone lamella is a risk factor for bone resorption. Numerous studies have shown this to be the case. The thinner the buccal wall, the greater the proportion of bundle bone. We know that this structure resorbs when it no longer receives nutrients via the periodontal ligament. So, in the spontaneous healing of an extraction socket with a very thin buccal bone wall, there is a high probability of complete resorption. The thicker the bone, the better are the chances of preserving volume.

This correlation was very noticeable in the control group with spontaneous healing. In the group in which we carried out Ridge Preservation however, the volume was preserved equally successfully in all sockets – irrespective of whether the buccal wall was thick or thin.

There are many other factors affecting how much bone is retained. For example, whether teeth are extracted using a flap or flapless approach.

Dr. Cardaropoli: That’s right. There is study data indicating the negative effects of flap formation, for example from Nobuto et al. It shows that flap formation triggers various biological processes resulting in reduced blood supply and hypoxia in the cortical bone. This in turn intensifies bone resorption on the surface. Particularly in the case of a thin buccal bone lamella, flap-induced bone resorption is most undesirable.

If you do not form a flap, primary wound closure above the filled socket is virtually impossible. How did you go about it?

Dr. Cardaropoli: Flap formation indeed has advantages and disadvantages in terms of primary wound closure. On one hand, the graft can be optimally covered by flap formation, which affords the augmented socket protection while healing. On the other, the mucogingival border is displaced in a coronal direction by mobilizing a flap. You thus lose keratinised tissue and the mucosa moves closer to where the implant will later be placed.

This, in turn, is a disadvantage, because the implant should be surrounded by a margin of keratinised tissue, not by mucosa. Otherwise it is harder for patients to maintain good oral hygiene around the implant. We allowed the membrane to heal openly to circumvent these problems.
Did this approach work out well?

Dr. Cardaropoli: Indeed. The epithelium healed entirely between the third and fourth week. The soft-tissue cover did not take longer than four weeks to close in any patient and no infections occurred.

What has to be taken into account in the open healing approach?

Dr. Cardaropoli: It is important for the membrane to be really stable. It needs to be cut to the correct size and adapted under the sulcus. The membrane should lie directly on the graft. To secure it, a horizontal cross suture is applied across the membrane without the suture penetrating the membrane itself.

The membrane also has to be protected against infections. In addition to analgesic medicines we prescribed oral antibiotics and Chlorhexidine rinse 0.2% every eight hours for six days up to the complete wound closure.

Once again, specifically: what benefits do you see in this procedure?

Dr. Cardaropoli: I want to preserve ridge volume following dental extraction using a predictable technique which causes as little pain as possible and eliminates the need for additional regenerative surgery. At first glance the flapless approach that we used in this study is unconventional, but it has worked very well.

Interview: Natalia Bruenisholz, Claudia Bühlmann, Dr. Mireia Comellas

References:

Case study by Dr. Manuel Neves and Dr. Celia Alves, Portugal

Socket management is a good idea with bridge restorations too

Ridge Preservation can be a good idea, not only if planning an implant, but also when a prosthetic restoration is being planned. The clinical case by Dr. Manuel Neves and Dr. Celia Alves from Oporto, Portugal, illustrates the procedure step by step.

1 Initial situation: Exploration with the periodontal probe reveals a defect in the buccal bone wall.
2 Ridge Preservation with Geistlich Bio-Gide® collagen membrane and Geistlich Bio-Oss® Collagen following flapless extraction. The socket is sealed with a cross suture and heals uncovered.
3 Radiological and clinical examinations 4 months after surgery reveal the tissue to have healed well.
4 Aesthetically appealing result 12 months on.