New augmentation materials—What is the gold standard?

Dr Rolf Vollmer

_Now that we are on the verge of IDS, International Dental Show, I personally am eager to see what is going to be presented, especially with regard to the latest developments in bone augmentation materials. Osteogenesis takes place only in the sense of enclosing newly formed bone, which remains a biofunctionally foreign body within the augmented area for many years. The maxillary sinus seems to be a special subject and location with regard to osteogenesis. In sinus lift procedures with or without simultaneous implantation, many materials are working very well because of its special conditions. Lundberg et al. found out that the sinus is a sterile cavity. Its sterility is based on the epithelium cells' potential to produce nitric oxide, which has an aseptic effect. Another important factor for the regeneration of the augmented material is the blood supply, according to Benner and Schlehhuber.

I think we all agree that, for small multi-wall defects, xenogeneic grafts are helpful and usually produce a non-vital, hard ceramic regeneration result. The subsequent drilling at such sites, however, is probably not a pleasure. In addition, many xenogeneic materials cannot be absorbed and the blending of autologous bone with xenogeneic material seems a challenge. In their studies at the University of Düsseldorf, Becker and Schwarz observed the best results with 50 % and a minimum of 30 % of autogenous bone in a mixture with a two-phase bone substitute material. Sinus lifts by crumbly grafts are easy to handle, but they should be given at least six to twelve months to heal. This amount of time can be a disaster for the patient. If it comes to an infection, the decomposition products of consequent mass cell deaths are a feast for invading bacteria. The situation for vertical augmentation is even worse. Bone graft materials of varying forms are available in unlimited quantities, which might make them suitable even for large defects. But do they really have high resorption stability and do they thus serve as guide rails for the ingrowths of new blood vessels and a subsequent osteoneogenesis?

In endogenous bone augmentation, I transfer vital cells, mineralised bone, fibrin and platelets and achieve a high biological potency for regeneration. In addition, I can then be sure that there will be no problems with the material I added to the bony structures. The fear of a second surgical defect is justified, but for smaller defects I can usually use the bone from the surgical site or nearby. Furthermore, I do not have additional material costs with autologous bone. Because of these considerations, I still use the endogenous bone for augmentation.

The surgeon has to decide upon the procedure after investigating the amount of bone that is missing. For this, DGZI wants to support our colleagues by postgraduate education and aid to decision-making.

I hope to see you all in Cologne, Germany, at our DGZI booth and look forward to discussing everything which can make our life easier and help our patients in the future.

Yours,

Dr Rolf Vollmer