WEBINAR OF THE MONTH

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TOPIC

We love biology—The Stable Tissue Concept in daily practice

Long-term stable results are what every dentist should strive for with his work. Patients trust us and pay a lot of money when it comes to implantological rehabilitation. Many problems in implantology are home-made because biological principles are disregarded. Bone and soft tissue management should be firmly anchored in the implantological dentist's portfolio, as stable tissues are the basic prerequisite for implantological success. For this purpose, hard and soft tissue augmentation must be carried out with materials that are adapted to the situation and indication. Dr Kai Zwanzig has been using allogeneic materials, which are completely absorbed by the body and thus integrated into the organism, with great success for more than 10 years. Another important factor is the choice of the right implant system. The hardware is also a decisive factor in whether the bone level is maintained. Conical internal connections are best suited for this purpose, as they ensure the necessary stability of the abutment. But even here there are decisive differences, because not all cones are the same! With the Stable Tissue Concept by Dr Zwanzig it is possible to preserve all structures to the maximum, in which the implant system in particular plays a predominant role. The self-locking conical inner connection prevents any movement of the abutment and is absolutely bacteria-proof. This prevents any micro-movements that could lead to bone loss and biological complications. In addition, there is no titanium abrasion, which can subsequently lead to incompatibilities. The Stable Tissue Concept combines state-of-the-art treatment methods with innovative materials to generate the best possible treatment results.

Dr Kai Zwanzig
About the speaker

Registration/ZWP Study Club

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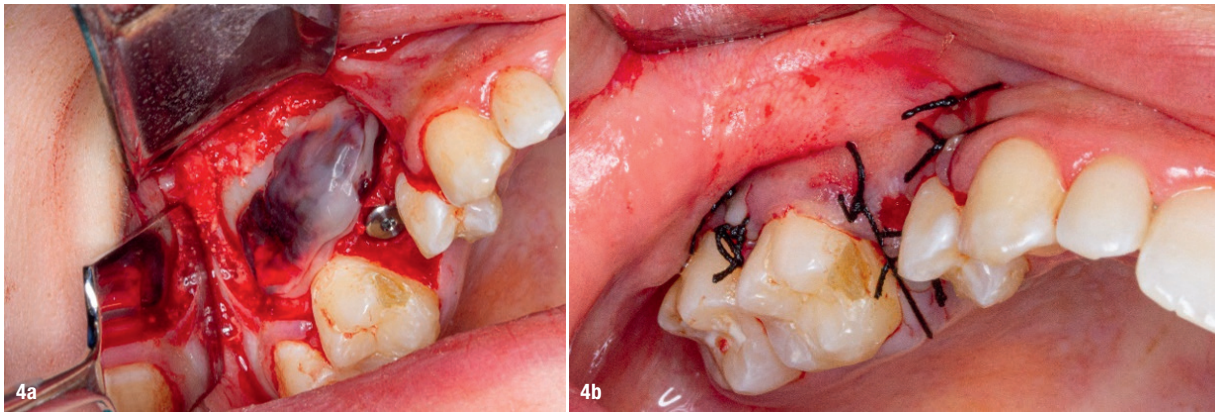

Figs. 4a & b: Autologous fibrin membranes and sutures.

control, thus assuring completely safe access to the most difficult anatomical zones and high cutting precision; c) Cavitation with the cooling saline solution that is generated from the characteristic ultrasonic vibrations produces tiny sprayed particles of water that keep the area cool and free of blood, thus avoiding overheating of the tissue and allowing optimal intra-operative visibility.

Sandwich Technique

This technique recommends 3D bone reconstruction around the entire body of the implant in cases of elevation of the sinus floor by 4–5 mm and implant placement in the same stage. The technique recommends that two vertical osteotomies be performed on the lateral wall of the maxillary sinus to delimit the bone area to be grafted. A third inferior horizontal osteotomy is performed according to the bone availability shown on a CT scan and a fourth superior horizontal osteotomy to delimit the height of the graft. The bone window produced is reflected into the maxillary sinus with the intention of functioning as a ceiling for the grafted area. Whenever possible, it is advisable to maintain the integrity of the Schneiderian membrane. If it is eventually perforated during the osteotomy or is already perforated, it is necessary to place an additional membrane. Sticky bone (CERASORB M, curasan; and platelet-rich fibrin) is placed and compressed in the posterior (palatal) portion of the bone window. It is easy to manipulate and accelerates tissue healing and minimises bone loss during the healing period. Subsequently, the implant is placed, the existing cervical bone acting as the primary stability source. Finally, new sticky bone is placed in the anterior portion (vestibular) and membranes of autologous fibrin are applied as a cover of the bone graft.

CERASORB M is a resorbable beta-tricalcium phosphate, pure phase, biomimetic and totally resorbable to fill, join and rebuild bone defects of small, medium and large dimensions; as well as to promote bone fusion throughout the skeletal system. CERASORB M is made of biocompatible synthetic ceramic material with a phase purity of approximately ≥99%.[20] CERASORB M granules have a polygonal shape which allows for better structural adaptation between them, they have an open interconnected micro, meso and multiporous structure macropores (about 65%), radiopacity is lower and absorption and remodeling in autologous human bone are achieved more quickly than with conventional biomaterials. Over the course of months in contact with vital bone, the CERASORB M material is resorbed and simultaneously replaced by autol-

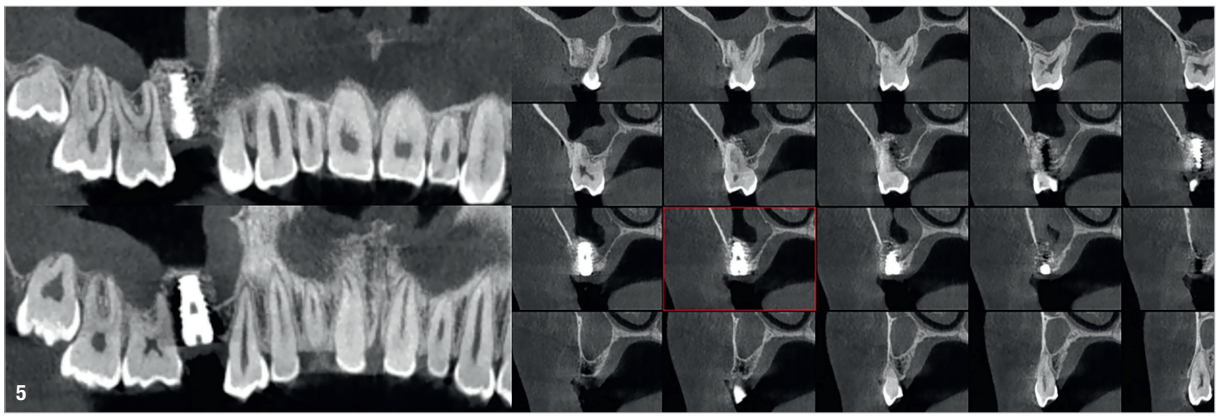

Fig. 5: Final CT scan with coronal and sagittal sections.

ogous bone tissue. As a synthetic and bioactive ceramic material, CERASORB M has excellent histocompatibility and absence of local or systemic toxicity. Unlike materials of biological origin, CERASORB M does not present a risk of infection or allergic reaction, which should be considered an important advantage.[20] Platelet-rich fibrin is composed of therapeutic blood matrices obtained by selective centrifugation and acts as an adjuvant in bone and tissue repair. To obtain the fibrin matrices, autologous blood samples are collected in dry 10 ml pure glass tubes (Montserrat) and blood samples in dry polystyrene tubes (Greiner Bio-One), in a tube ratio of 6:2. They should be centrifuged in a centrifuge (Ortoalresa), according to the protocol described by Duarte de Almeida and Alves de Oliveira,[21] which uses a relative centrifugal force of 200 × g for 10 minutes to obtain two physical forms of fibrin, the polymeric form or solid gel, and the monomeric or temporary liquid form only in one centrifugation step.

Clinical case

A 21-year-old female patient attended the oral-maxillofacial surgery consultation at Clitrofa medical centre in Trofa in Portugal for placement of an implant in anatomical position #15. In the anamnesis, no allergies or use of medications was reported. On extra-oral clinical examination, no abnormalities were observed. On intra-oral physical examination, a slight bone depression was noted in position #15 as a result of dental agenesis. In the CT scan, a sinus floor of 4 mm in height was detected in position #15, making the case suitable for a one-stage implant technique—the Sandwich Technique (Fig. 1). Two vertical osteotomies were performed on the lateral wall of the maxillary sinus to delimit the bone area to be grafted. A third inferior horizontal osteotomy was performed according to the bone availability shown on the CT scan and a fourth superior horizontal osteotomy was performed to delimit the height of the graft 10 mm. The bone window produced was reflected into the maxillary sinus, and the Schneiderian membrane was kept intact. The use of platelet-rich fibrin in the grafting process offers the benefits of modelling of the inflammatory response, immune response and tissue repair, tissue reorganisation and angiogenesis. The association with mineral biomaterials facilitates handling and application and allows immediate adhesion to the receiving bed (Fig. 2).

The sticky bone was inserted with maximal light compression into the posterior (palatal) portion of the bone window. Subsequently, the implant (Epikut HE, 4.5 × 10.0 mm; S.I.N. Implant System) was placed, the existing cervical bone acting as the primary stability source. More sticky bone was inserted into the anterior portion (vestibular; Fig. 3). The autologous fibrin membranes create a protected environment for bone regeneration in the defect area and support osteogenesis by presenting a barrier to the infiltration (migration) of soft tissue and thus promote growth of osteogenic cells in the bone defect. Suturing was performed with simple sutures using non-resorbable thread (#4/0 silk; Fig. 4). The patient underwent systemic antibiotic, analgesic and anti-inflammatory therapy for eight days. Regarding postoperative care, the patient was instructed to maintain strict oral hygiene. After a postoperative period of six months, evaluated by a postoperative CT scan, there was evidence of new bone formation of 12 mm in height around the entire implant body and apex (Fig. 5).

Conclusion

Diffuse maxillary sinus remodeling and posterior maxillary morphology after tooth loss suggest several treatment options. Maxillary sinus graft is an increasingly common procedure in implantology, and the use of resorbable and biomimetic bone regeneration materials, such as CERASORB M, in combination with platelet-rich fibrin (sticky bone), should be considered. This technique has a safety, predictability and longevity character for the rehabilitation of the posterior maxillary sector, and it can be performed alone or in conjunction with other reconstructive procedures. When approached and managed properly, the sandwich technique leads not only to bone reconstruction of the posterior maxilla, but simultaneously to the placement of the dental implant, with consequent restoration of the orthoalveolar shape and function between the arches.

Conflict of interest: The authors declare that there is no conflict of interest regarding the publication of this article.

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Literature