

Experience with the biological Tutodent® membrane in implant practice

Without the use of membranes in bone tissue regeneration during the last 20 years, the advance in oral implantology would not have been possible. The introduction of resorbable membranes has facilitated the surgical handling and significantly reduced the risk of complication in such procedures.

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Tutodent® membrane, already used in orthopaedic surgery for a long time, became available in the dental sector in the year 2000. This membrane, based on bovine pericardium, is produced by the Tutoplast® process, which differs in certain aspects from the other manufacturing processes commonly used today. This process maintains the extracellular matrix of the connective and supporting tissues, which alters the properties of the membrane in comparison with other products, without affecting its safety with respect to pathogen transmission and antigenic reaction.

The membrane has been used in our practice since 2000, in all areas of bone and soft tissue regeneration; the main application is in bone augmentation before or during implantation. For the user, the first feature that distinguishes Tutodent® membrane from other similar products is its availability in different sizes, including membranes with large surface areas, so that extensive defects can also be securely covered with a single membrane. The surgical handling of Tutodent® membrane is not significantly different from the other collagen-based membranes on offer; it is resistant to tearing, has tensile strength and is very adaptable when moist. In our practice, when used to cover bone reconstruction material, the membrane is usually fixed with nails as recommended by the manufacturer. This brings a further advantage of the membrane into play: its somewhat coarse consistency also prevents too-rapid restructuring of the material even when it is in tension – something that is known to reduce considerably the time which a biodegradable membrane lasts.

We often use the membrane in double thickness, taking advantage of the fact that, depending on the healing process and restructuring, the membrane volume will be almost completely converted into connective tissue. We therefore deliberately use the membrane to increase the connective tissue around the incisors and canines and in this way can even spare the patient the necessity of a connective tissue transplant and the second operation this would require. Since 2000, some 400 surgical procedures have been carried out in our practice using this product. In comparison with other biodegradable or resorbable membranes, no increased risk of complication has been demonstrated. The membrane does not carry an increased risk of exacerbation with wound dehiscence and the

stability of the membrane even in contact with saliva is so good that, as a rule, there is no premature exposure of the augmentation – something that would severely limit the success of treatment. Below, we describe brief examples of the membrane's use in practice.

Case 1: a 36-year old female patient for whom an elective implantation was planned following the traumatic loss of 21; a clearly visible soft-tissue deficit also had to be evened out. After demonstration of the alveolar bone using a minimally invasive incision technique without release-incision, a root-form implant 5.5 mm in diameter was inserted. To even out the soft tissue deficit on the vestibular aspect, a mucosal pocket was prepared by periosteal slit. A double layer of Tutodent® membrane was then inserted into this pocket to increase the volume. Open healing was selected in this case, i.e. a 5 mm healing cap was placed on the implant and the wound closed with resorbable sutures. Even immediately after the operation, the increased vestibular volume could be seen. The picture taken of the final restoration about one year post-op. shows a harmonised gingival profile without soft tissue loss, making this case definitely a medical as well as an aesthetic success.

Figures 11-15 show how the flexibility and surface characteristics of the Tutodent® membrane greatly facilitate its use in covering larger defects. The natural roughness of the surface allows rapid tissue integration through adhesion.

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((Legend))

Fig. 1: Case 1 – situation prior to implantation, with temporary crown

Fig. 2: During operation, without temporary crown, tissue defect easily recognisable

Fig. 3: Creation of the implant bed

Fig. 4: Insertion of a root-form implant

Fig. 5: Preparation of a vestibular mucosal pocket

Fig. 6: Double layer of Tutodent® membrane

Fig. 7: Insertion of the membrane into the mucosal pocket

Fig. 8: Open healing after closure with sutures

Fig. 9: The patient's lips and teeth with finished restoration

Fig. 10: Finished restoration 11 and 21 with harmonised soft tissue line 1 year post-op

Figs 11 and 12: Covering the site of bone resection in the chin with large Tutodent® membrane

Fig. 13: Palatal fixation of a Tutodent® membrane before augmentation around the upper incisors and canines

Figs 14 and 15: Occlusal and frontal views – large covering of bone reconstruction around the incisors and canines