

Clinical Sheet

SINUS LIFT WITH GRANULAR AND BLOCK BONE SUBSTITUTES



The use of block grafts for the protection of the sinus membrane.



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The prosthetic guided implant rehabilitation is the treatment of choice for completely or partially edentulous patients. When it involves the superior maxilla, it may pose a significant challenge, as the bone tissue in this anatomical area may be less or less dense. In such cases, the oral surgeon may have recourse to the lateral access maxillary sinus lift technique to increase the quantity of available bone tissue.

The technique entails creating a lateral access window to the sinus, followed by the detachment of the Schneiderian membrane from the bone floor and its subsequent lifting. It is completed with the placement of a biomaterial inside the space created between the membrane and the sinus floor. The access window may be covered using a resorbable membrane. The implant may be inserted at the same time or at a later surgical stage, depending on the thickness of the residual ridge. In the latter case, a few months elapse between the sinus lift and the implant insertion, to allow an adequate quantity of new bone tissue to form.

One of the most frequent intraoperative complications is laceration of the membrane; in the most serious cases, this event causes the procedure to be interrupted and postponed. The careful use of particular bone substitute formats can help prevent this complication during insertion of the implant.

Materials

The procedure entailed using granular and block equine bone substitutes (Bioteck) and an equine collagen membrane (Biocollagen, Bioteck).

The granular bone graft consists of 1:1 cancellous and cortical granules, having a diameter of 0.5 mm-1 mm. It is obtained through the Zymo-Teck enzymatic process, which assures selective elimination of antigens without applying high temperatures or using organic solvents. The block graft (Bioteck) is a rigid sheet, 5-8 mm thick,

with preserved bone collagen, also obtained through the Zymo-Teck enzymatic process.

At the end of grafting, the sinus access window was protected using the Biocollagen membrane, a resorbable membrane obtained from equine Achilles' tendon collagen, whose characteristic ease of handling makes its use very simple, even if not hydrated. It protects for 3-4 weeks.

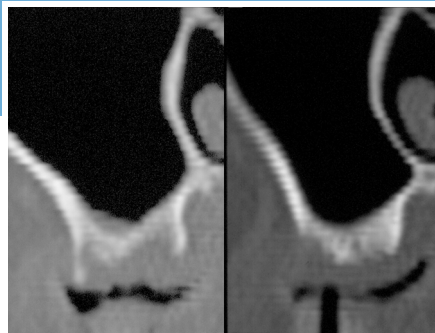


Fig. 1 – Pre-operative CBCT scan showing extensive bone atrophy.



Fig. 2 – Pre-operative clinical appearance. The patient presents with extensive edentulism, starting from the first premolar.

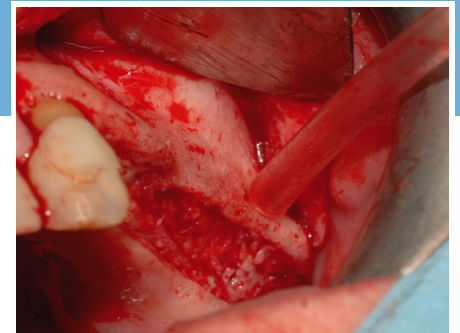


Fig. 3 – Lifting the flap. Significant atrophy of the medial crestal portion is observed, more apical than the cortical residual portions.

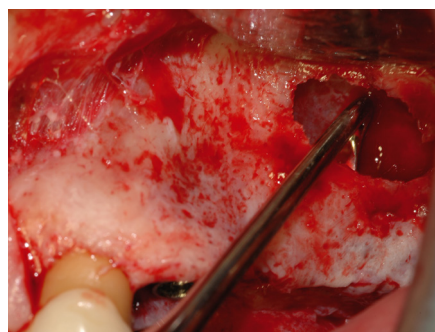


Fig. 4 – Opening of the lateral window and detachment of the Schneiderian membrane, following placement of the first implant.



Fig. 5 – Grafting a portion of bone sheet to protect the sinus membrane.

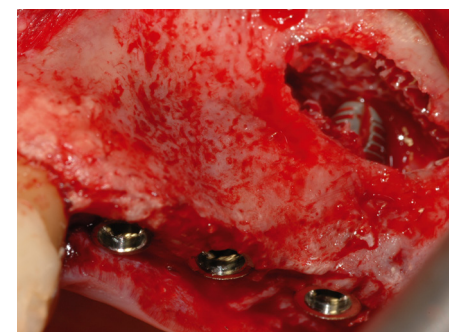


Fig. 6 – Placement of the two additional osteointegrated implants; the apex of the implants rests on the bone sheet.

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Results

The sheet summarizes the case of a 64-year-old female patient who visited the doctor for the rehabilitation of the left posterior superior arch, edentulous from tooth 2.4 included. The CBCT scan showed extensive atrophy of the maxilla and a height of the bone ridge that, at certain sites, did not exceed 3-4 mm. The patient was therefore recommended a procedure of lateral maxillary sinus lift and simultaneous placement of three osteointegrated implants, to support three crowns at teeth 2.4, 2.5 and 2.6. The patient provided her informed consent. The procedure was performed under conscious sedation.

First, the first implant was placed at site 2.4, followed by opening the access window to the sinus, using appropriate piezoelectric instruments. Using a safe-scraper, autologous bone was also harvested from the ridge. The sinus membrane was then detached and lifted, ensuring that the nasal side of the sinus was also uncovered, to give the graft the best chance of being colonized by cells and vessels.

Before proceeding with the implant placement operations, the sinus membrane was protected by

placing underneath it a portion of the bone sheet that was appropriately shaped with a bone Rongeur: this was to prevent it from being damaged by the subsequent placement of the implants.

The implant sites were prepared using suitable drills as well as the osteotome in the thinner portions of the ridge. Implant placement was performed once the available volume had been partially filled with the granular graft mixed with the autologous bone that had been harvested previously; filling was completed at the end of implant placement, using, in addition to the granular graft, other parts of the bone sheet as well, and the access window to the sinus was protected with the collagen membrane.

The patient was permanently rehabilitated five months later. The X-rays seven years after the procedure confirmed the adequate preservation of the regenerated bone volumes, as well as of the peri-implant bone levels.

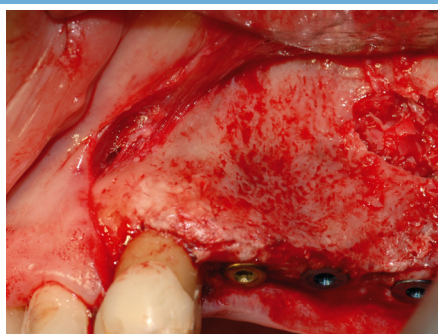


Fig. 7 – Completion of filling with the granular graft.



Fig. 8 – Final placement of an additional portion of bone sheet to close the access window.



Fig. 9 – Protection of the access window with a resorbable collagen membrane.



Fig. 10 – The final prosthesis before it is fitted on the patient.



Fig. 11 – Clinical appearance of the final prosthesis.

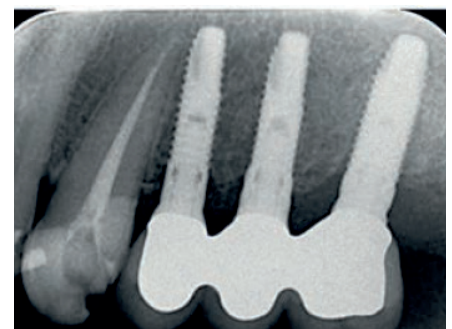


Fig. 12 – X-ray seven years later. One can see the preservation of the grafted bone volume and of the peri-implant bone levels.



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