

Lateral nasal wall lift using trap door technique – a new method for the severely atrophic maxilla

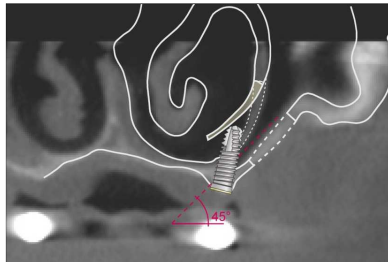
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Introduction

An implant in the anterior severely atrophic maxilla is often only possible accompanied by extensive augmentation procedures – and all the documented disadvantages they entail. More favourable are three implants inserted on each side during a bilateral sinus lift to support a detachable, gum-free prosthesis. Without implants in the anterior region, the margin for an esthetic dental arrangement is increased and structural support in the lateral region is also more favorable. The vertical tissue deficit manifest in severely atrophic cases is compensated for by means of prosthesis. In comparison to alternative options, this treatment plan combines good function, good esthetics and good hygiene with minor demands on the patient in terms of surgical measures.

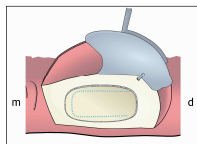
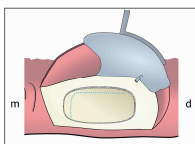
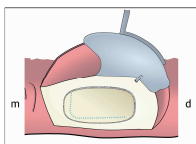
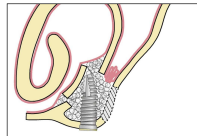
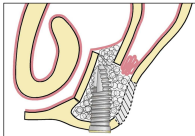
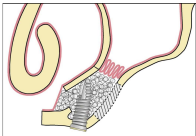
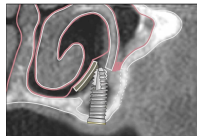
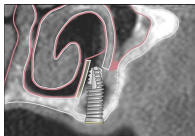
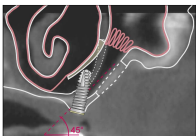
Problem

In some cases the maxillary sinus is transversely very narrow and also often broadens anteriorly, combined with a marked prominence of the lateral nasal wall. In such cases a sinus lift with insertion of implants in a prosthetically favourable axial direction is not possible, even if shorter implants are used. Thanks to advances in 3D diagnostics, particularly the practical use of DVT (CBT), such cases can be diagnosed in advance.



Method

By shifting the lateral nasal wall by means of a trapdoor osteotomy it is possible to broaden the narrow maxillary sinus, correct the implant axis and achieve sufficient implant length. Depending on the osteotomy line, a lateral nasal lift can take 3 different forms:



Cranially pedicled trapdoor
Caudal osteotomy with anterior relief to create space (broadening) and straighten the implant axis

Caudally pedicled trapdoor
Cranial, anterior and caudal osteotomy to create straighten the implant axis

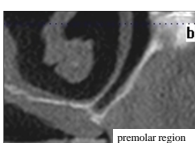
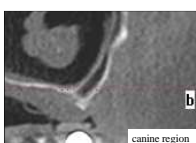
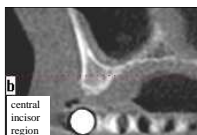
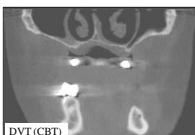
Distally pedicled trapdoor
Cranial, anterior and caudal osteotomy to create extensive space and straighten the implant axis

It is possible to carefully prepare the osteotomy line using a piezo-surgical technique: The nasal mucosa is either elevated prior to the procedure from the apertura piriformis, that is from the anterior, or carefully along the fracture line following the osteotomy. Here, it is essential that the nasal mucosa remains intact to avoid any potential infection in the augmented site. An adequate periosteal pedicle graft is necessary to stop the shifted bone becoming necrotic. Subject to the initial anatomical scenario, the extent of shifting tends to be relatively small in order to avoid impeding nasal breathing. Depending on the given situation, a partial resection of the inferior nasal concha (turbinectomy) may be required, either at the time or at a later date.

Case presentation

Treatment of a severely atrophic edentulous maxilla with a bilateral sinus lift, left-side lateral nasal lift acc. to Lindorf and 6 XiVe implants.

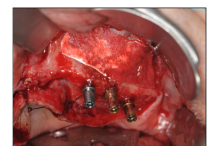
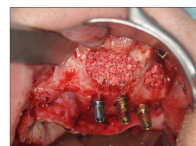
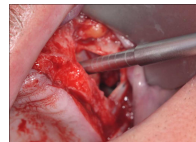
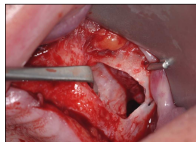
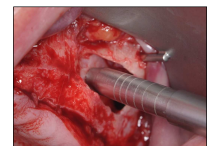
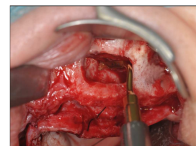
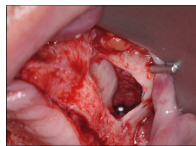
3D diagnostics via DVT (CBT) showed an almost complete loss of the alveolar process in the patient who has been without teeth for 20 years. The vertical bone available in the anterior tooth area was insufficient for an implant. There was evidence of significant asymmetry of the main nasal cavity with a pronounced curvature of the lateral nasal wall on the left. Consequently, the left maxillary sinus was extremely narrow; primarily in the incisor and premolar area.



Without a lateral nasal lift, it would have been necessary to insert the implants in the left maxilla at a centripetal angle of approx. 45°. The implant emergence profile would then have been positioned to the inner gum line, more so due to the centripetal resorption of the maxilla, even if the axis could have been corrected by means of prosthesis.

At the same time, the large volume of the nasal cavity presented optimal conditions for a lateral nasal lift to straighten the implant axis. Caudal osteotomy of the lateral nasal wall was planned (variant 1). This was to allow the centripetal angle of the implants to be reduced to a prosthetically acceptable 25°.

The procedure was carried out under local anesthesia with perioperative antibiotics (Amoxicillin). Particular autologous bone was harvested from the right mandibular angle using clustered blind end drilling technique acc. to Lindorf. By applying the Lindorf hook-type sinus retractor (KLS Martin) to securely hold back the soft tissue, the facial maxillary sinus wall was exposed in the left maxilla. After creating a bone window the maxillary sinus membrane was fully elevated from the alveolar recess and repositioned in a cranial direction. The intended osteotomy line was prepared with a piezo-surgical device (Mectron). The bone was then fractured along the designated line via careful hammering with an osteotome and pressed 5-6mm medially. Wedges at the ends of the osteotomy line allowed the stable displacement of the lateral nasal wall without further anchoring. Preparation of the implant bed was then carried out via undersized drilling and bone spreading. It was then possible to introduce 3 XiVe implants with good primary stability. The sinus floor area was augmented with particulate autologous bone and Bio Oss™ (Geistlich) 1:3. The facial sinus wall was reconstructed with a BioGide™ membrane (Geistlich). The site was closed with a tension-free suture.



The contralateral side was treated in the same way but without the additional nasal lift.

After 9 months the implants could be exposed and the attending family dentist took over prosthetic treatment in line with our treatment plan for a highly atrophic, edentulous maxilla. The patient was very satisfied with the result both in terms of function and esthetics. Furthermore there was no evidence of deterioration of nasal breathing.



Discussion

The surgical procedure is both complex and technique-sensitive: It requires significant surgical experience. It is necessary for the anatomical situation to be precisely clarified in advance – particularly with reference to the nasal conchae. In comparison with the individual alternatives open to this kind of initial situation – the Le Fort I osteotomy with iliac crest interponate or the comprehensive iliac crest onlay graft – this method however, represents a relatively low impact option for the patient, particularly with a one-step procedure. Any issues that might arise vis à vis nasal breathing in light of unfavorable anatomical conditions can be remedied through a small procedure on the inferior nasal concha (turbinectomy), either during the operation or at a later date.

As such, the lateral nasal lift method represents an expansion of the treatment spectrum in difficult borderline implant cases.

Literature

- Lindorf, H.H., Müller-Herzog, R.: Die gebündelte Sacklochbohrung – Teil II. ZMK. 18(7-8):486-73 (2002)
- Lindorf, H.H., Müller-Herzog, R.: Der Sinus-Krallenhaken. Oralchirurgie Journal. (1):20-22 (2009)
- Lindorf, H.H., Lehner, J., Müller-Herzog, R.: Der laterale Nasenlift mittels Trapdoor-Technik. ZMK. 27, 9 (2011)



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