

Background information

Beat Walkkamm:

«In my practice I use the techniques originally described by Boyne and James (1) and by Tatum (2) for sinus floor augmentation with lateral access. To standardise it and thus improve the prognosis, I have simplified a few steps. The modifications concern mainly the incision, transmucosal implant healing and complete removal of the bone wall in the sense of an antrostomy.»

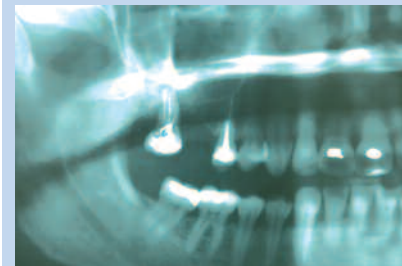
2. Main emphasis of this case presentation

- > Clinical procedure in standard cases when there are complications with the sinus membrane and septa.

3. Surgical procedure on the basis of different cases

Case A (A1–A18): Standard clinical procedure, step by step. 45 year old patient, healthy, nonsmoker.

Cases B, C, D, E: pictures from these cases to illustrate alternative situations.



A1 Initial radiological situation prior to extraction of tooth 17 because of apical and marginal periodontitis. Tooth 16 was lost years previously.



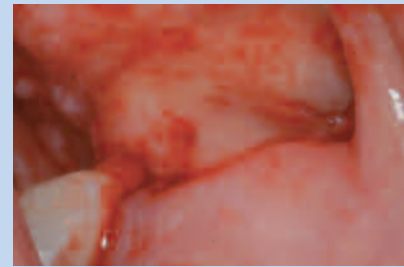
A2 3 months after extraction of tooth 17. On the radiograph, residual bone thickness of 5 mm can be seen in position 16 and 6 mm in position 17. A one-stage procedure with lateral approach to the sinus is therefore indicated. Implant planning with film on the OPG.



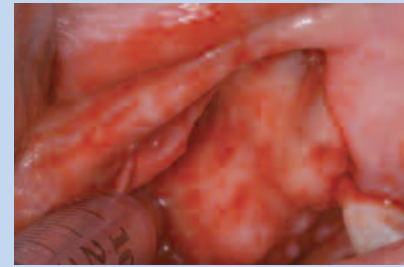
A3 Initial preoperative clinical situation



A4 Free end situation: Alveolar ridge incision with V-shaped releasing incision



A5 Mesial releasing incision: C-shaped mesiobuccal incision over the mesial adjacent tooth



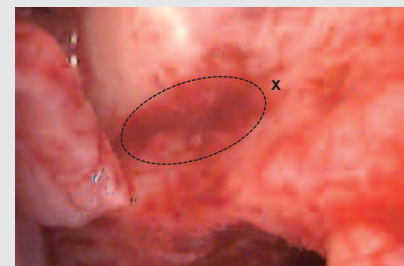
A6 Raising the mucoperiosteal flap beyond the desired extent of the lateral fenestration. Autologous blood collected in a sterile disposable syringe.



Alternative Offset gap situation: Alveolar ridge incision with sulcal releasing incision mesially and distally (case C)



Alternative Mesial releasing incision: C-shaped mesiobuccal incision over the mesial adjacent tooth or over the next mesial tooth if more space is needed. The papilla is divided at its base. (case B)



Alternative Raising the mucoperiosteal flap. The most apical part of the maxillary sinus (x) is located in the region of the so-called 'red zone'. (case B)

Augmentation material

Beat Walkkamm: «Sinus augmentation with Bio-Oss® alone can be carried out with a very good prognosis. This is shown by the literature (3–6). In my practice, I prefer to add a small amount of particulate autologous bone in a ratio of 0–50% autologous bone to 50–100% Bio-Oss®. After opening the operation field I obtain the bone from the adjacent bone walls using a bone scraper, especially through the proposed fenestration.»



A7 Obtaining autologous bone chips with the Safescraper®

Fenestration

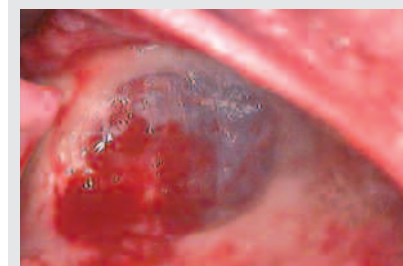
Beat Walkkamm: «Today I remove the buccal bone plate in practically every case. That way I can keep the access smaller, have more flexibility if there are septa and the risk of sinus membrane perforation is smaller. A possible disadvantage is the lack of osteogenic potential in the roof of the filled sinus lumen when the bone plate is folded in. Removal of the plate followed by repositioning at the lateral fenestration brings no advantage as this bone plate becomes necrotic anyway.»



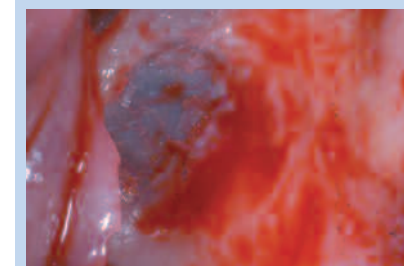
A8 Preparation of the lateral fenestration with the round diamond bur (diameter 3–5 mm). Minimum size approx. 8x6 mm. Removal of the entire bone plate.

Sinus membrane (Schneiderian membrane)

Beat Walkkamm: «As soon as the bone wall has been removed from the sinus membrane, the thickness of this membrane and the difficulties associated with detaching it can be assessed.»



Alternative Relatively pale appearance: Rather thick membrane. (case B)



A9 Membrane of medium thickness appears somewhat darker. (case A)



Alternative Rather thin membrane appears dark. (case C)

Instruments

Beat Walkkamm: «I use a basic implant tray from Hu-Friedy. The instruments for elevating the membrane are from Zepf and Friudent. They are available in different curvatures and have rounded ends.»



A10 Elevating the sinus membrane with rotating movements

Sinus membrane perforations

Beat Walkkamm: «Perforations of the sinus membrane are a frequent complication of sinus floor augmentation. According to the literature, they occur in 35–40% of cases (7, 8). I distinguish between small tears, medium-sized tears and large tears. To manage these tears, I select one of the following treatments depending on the size of the tear:

Small tears:
(up to 5 mm)

Glue the membrane edges with Tissucol or a small piece of collagen membrane (Bio-Gide®). I do not regard Histoacryl as suitable as the glued site becomes relatively stiff.

Medium-sized tears:
(up to about 20 mm)

Glue the edges with a piece of Bio-Gide® (finer compact side towards the sinus membrane). This technique has been described in the literature as the «Loma-Linda Technique» (9).

Large tears:
(> 20mm)

If the membrane is no longer sufficient to close the tear, the operation is halted and the lateral fenestration is closed with Bio-Gide®. Repeat operation after 6 months.

After stabilisation and closure of the tear, the sinus membrane is dissected off on the side away from the tear.»

Bone septa

If there is a bone septum in the region of the planned implantation site, the bony window must be removed completely in every case (see sinus membrane, case B, page 3). The further procedure is as follows:



Alternative Septum in the implantation region. (case B)



Alternative Membrane preparation: 2 spaces are prepared mesial and distal to the septum. (case B)

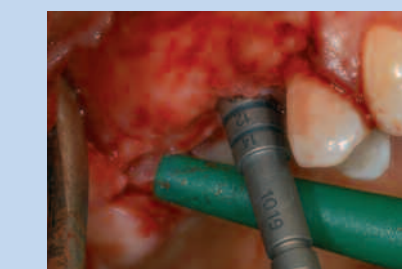


Alternative Implant insertion: The implant can be inserted mesially, distally or even in the region of the septum. (case B)

Further clinical procedure

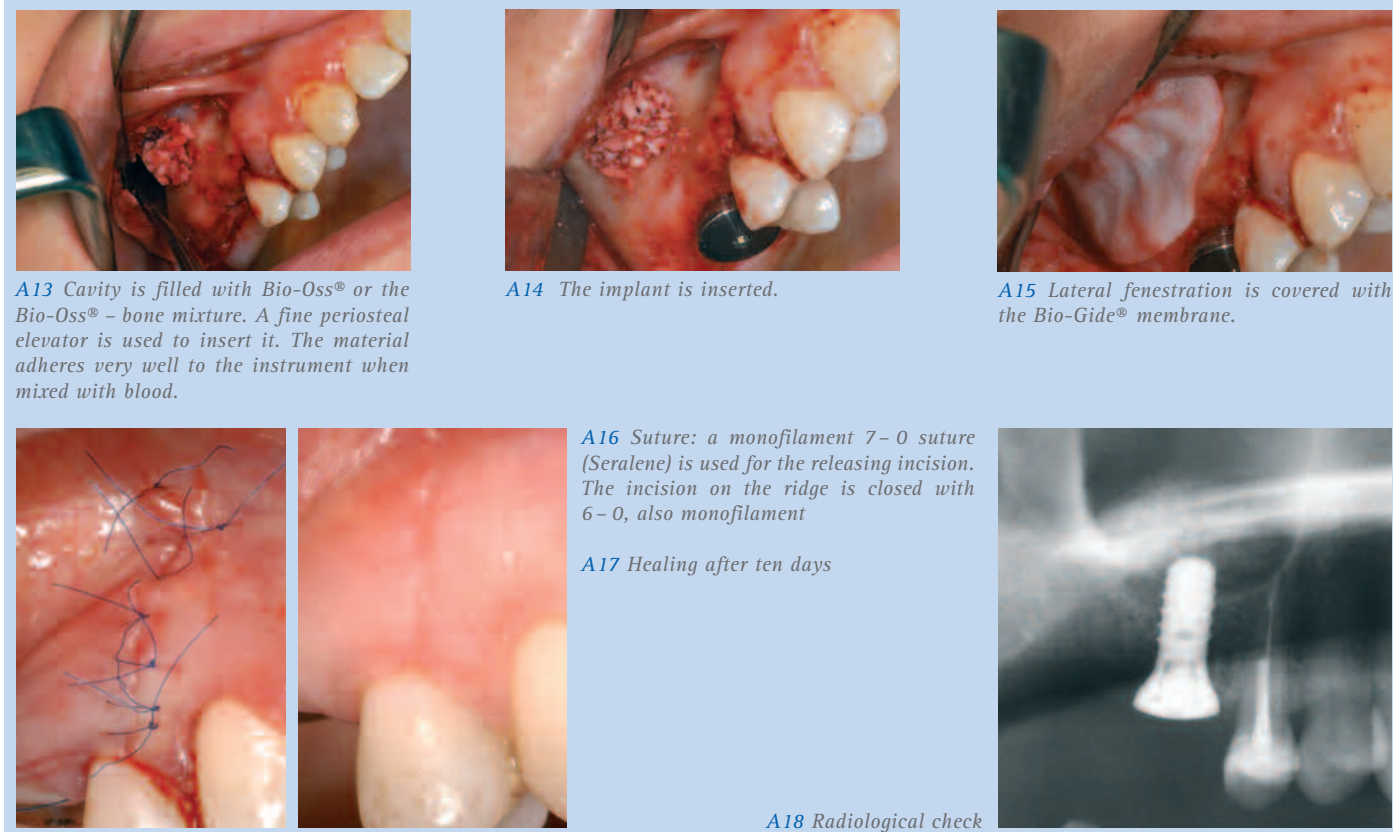


A11 Preparation with protective periosteal elevator



A12 Checking with the indicator elevator

Sinus Floor Augmentation



A13 Cavity is filled with Bio-Oss® or the Bio-Oss® - bone mixture. A fine periosteal elevator is used to insert it. The material adheres very well to the instrument when mixed with blood.

A14 The implant is inserted.

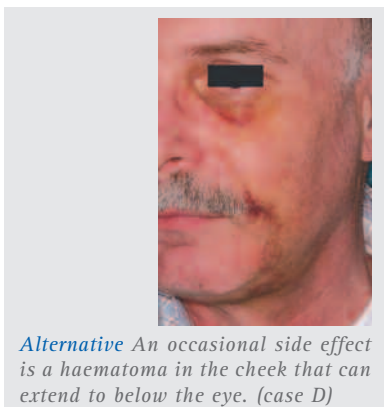
A15 Lateral fenestration is covered with the Bio-Gide® membrane.

A16 Suture: a monofilament 7-0 suture (Seralene) is used for the releasing incision. The incision on the ridge is closed with 6-0, also monofilament

A17 Healing after ten days

A18 Radiological check

4. Surgical aftercare



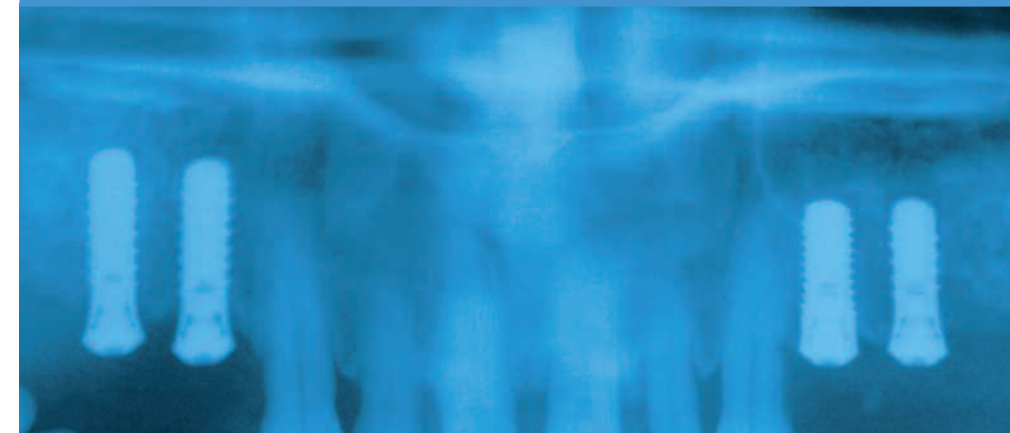
Alternative An occasional side effect is a haematoma in the cheek that can extend to below the eye. (case D)

Medications	<ul style="list-style-type: none"> - Rinse with 0.1% chlorhexidine for 4 weeks - Antibiotic therapy: amoxicillin / clavulanic acid 1000 mg twice a day for 3 days if penicillin allergic; Zithromax (azithromycin) 500 mg once a day for 3 days - Paracetamol 500 mg or ibuprofen 600 mg for pain - Local cooling
Follow-up appointments	- Week 1 (for suture removal) / Week 2 / Week 6
Opening and taking the impression	- Week 14

5. Long-term results

> The long-term prognosis for implants in an augmented sinus is very good (3, 10 - 13).

Alternative This case shows the radiological appearance 7.5 years after bilateral sinus lift. The probing depths around the implants are 2 - 4 mm. The patient was a risk patient, a smoker with loss of maxillary teeth because of periodontitis. The periodontitis in the mandible is under control. Fixed restoration is planned there too at a later stage. (case E)



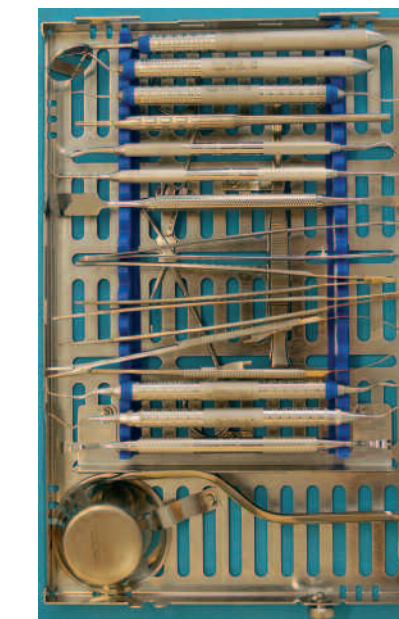
Clinical procedure of Dr. Beat Walkkamm, private practice, Langenthal CH

- > Sinus floor augmentation with lateral access and simultaneous implantation
- > Problems with sinus membrane and septum



1. Deciding criteria according to Beat Walkkamm

Augmentation technique depending on residual bone thickness	<ul style="list-style-type: none"> <input type="checkbox"/> Standard implantation without augmentation: > 8 mm residual bone thickness <input type="checkbox"/> Osteotome technique: 6 - 7 mm residual bone thickness <input checked="" type="checkbox"/> One-stage, lateral access: 4 - 5 mm residual bone thickness <input type="checkbox"/> Two-stage, lateral access: < 4 mm residual bone thickness
Addition of autologous bone	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Implant loading	<ul style="list-style-type: none"> <input type="checkbox"/> 2 months after augmentation and implantation <input checked="" type="checkbox"/> 4 months after augmentation and implantation <input type="checkbox"/> 6 months after augmentation and implantation



Sources of supply

Implant tray	Hu-Friedy Mfg. Co., Inc. Rudolf-Diesel-Straße 8, D-69181 Leimen Tel. +49 (0) 62 24 / 97 00-0 Fax +49 (0) 62 24 / 97 00-98 www.hu-friedy.com E-Mail: info@Hu-Friedy.de
Sinus instrument tray	A Helmut Zepf Medizintechnik GmbH Obere Hauptstrasse 16-22, D-78606 Seitingen-Oberflacht Tel.: +49/ (0) 7464 / 98 88 -0 Fax: +49/ (0) 7464 / 98 88 -88 www.zepf-dental.com E-Mail: info@zepf-dental.com B FRIADENT GmbH Steinzeugstr. 50, D-68229 Mannheim www.friadent.com Tel: +49 621 4302-000
Safescraper® / Micros®	Meta Via E. Villa n.7, 42100 Reggio Emilia, Italy www.metahosp.it Tel: +39.0522.50.23.11 Fax +39.0522.50.23.3
Tissuocol	Baxter One Baxter Parkway, Deerfield, IL 60015-4625, USA, www.baxter.com
Seralene suture 6-0 / 7-0	SERAG-WIESSNER KG D-95119 Naila, Zum Kugelfang 8-12 www.serag-wiessner.com Tel 09282-937-0 Fax 09282-937-9369

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Geistlich Pharma AG
Division Biomaterials
CH - 6110 Wolhusen, Switzerland
phone ++41-41-49 25 -630
fax ++41-41-49 25 -639
www.geistlich.com

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