

Background information

Dr. Zvi Artzi:

«Several studies have shown that the success rate of osseointegrated implants placed in grafted maxillary sinuses is comparable to implants in non-augmented sites (1-3). Bio-Oss® has been extensively investigated in the literature for sinus floor augmentation (4-26).»

2. Main emphasis of this case presentation

- > Step by step surgical procedure of sinus floor augmentation with Bio-Oss® and autogenous cortical bone chips simultaneously with implant placement, by using a surgical guide stent.

3. Surgical procedure

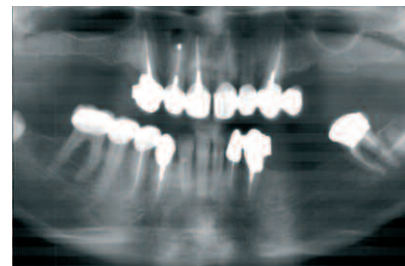


Fig. 1 Preoperative panoramic radiograph shows a pneumatized sinus with moderate atrophic residual ridge bilaterally. A CT scan enables a three-dimensional evaluation.



Fig. 2 Surgical stent is adjusted (fabricated by Dr. Jenny Chernobelsky).

Premedication

Premedication follows the protocol suggested by Misch (4): Dexamethasone 9 mg before surgery, 6 mg after 24 h and 3 mg after 48 h as an anti-inflammatory drug. Systemic antibiotics are administered 1h pre-op (Amoxicillin 1g) and for one week (500 mg QID). NSAID drug like Ibuprofen (400 mg) or Etodolac (400-600 mg) should be prescribed. Local anaesthesia by buccal and palatal infiltration of 3 % Lidocaine and 0.04 mg base Norepinephrine is administered.



Fig. 3 The stent guides accurate positioning of the gauge pins during the implant site preparation.



Fig. 4 The lateral bony wall is exposed with a vertical releasing incision to allow an extensive mucoperiosteal buccal flap at the edentulous posterior maxillary region. The contour of the lateral window is demarcated by a 2 mm diameter round diamond bur, average 8-12 mm (H)x 12-20 mm (W).

Membrane elevation

Fig. 5 As the Schneiderian membrane is exposed, a broad flat curette is pushed gently between the membrane and the inner bony wall to separate, release, and loosely reflect the membrane. The fractured bony wall is pushed inward and upward where the superior margin serves as a hinge (green stick fracture) of the window. This also eases a harmless membrane reflection. The Schneiderian membrane is elevated and a space between the reflected sinus membrane and the floor of the antrum is established.

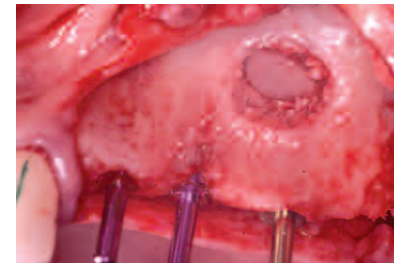
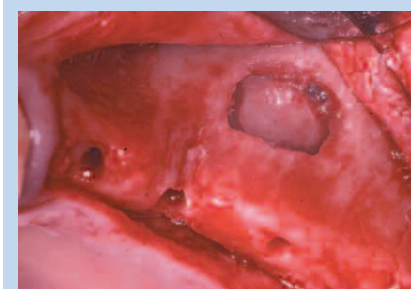


Fig. 6 The grafting material is applied in two increments, before and after implant placement. The first portion of the grafting material is applied through the fractured wall orifice.

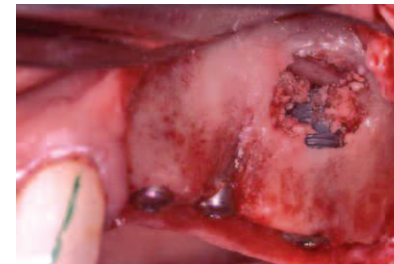


Fig. 7 The implants are placed.

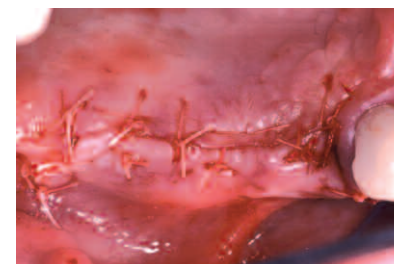


Fig. 10 Primary tissue closure is achieved using a non-absorbable 4-0 suture. Soft tissue healing was uneventful.

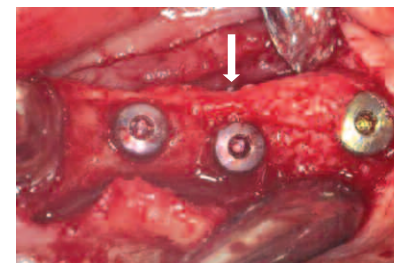


Fig. 13 Implant cover screws are exposed. Note the thick osseous tissue (arrow) established at the buccal side of the mesial implant which was augmented with Bio-Oss®.

Harvesting autogenous bone

When the lateral sinus wall is relatively thick (2 mm), as determined by the CT scan, corticalis chips can be harvested from the surgical site. Otherwise, autogenous bone chips can be collected by labial plate scraping of the lateral posterior area of the mandible near the external oblique line with the use of a manual scraper. Following local anaesthesia of the long buccal nerve, a blunt incision is made on the lateral posterior part of the mandible extending from the buccal masticatory mucosa to the ascending ramus with a Bad-Parker No. 15 c blade. A full thickness flap exposes the lateral retromolar mandibular bone area. By using the bone scraper, numerous bone chips are harvested from the corticalis. The chips are mixed in a 1:1 ratio with Bio-Oss® particles (0.25 - 1 mm in size), and blood is added for moisture.



Fig. 8 Subsequently, the second portion of the grafting material is applied to achieve complete obturation of the window.

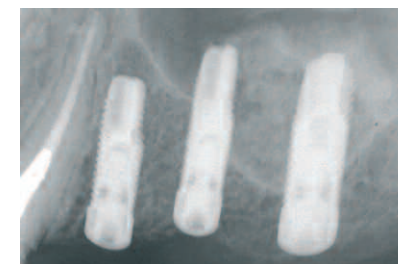


Fig. 11 Radiographically, Bio-Oss® particles are observed during the follow-up.



Fig. 14 The final prosthesis (courtesy of Dr. Jenny Chernobelsky).



Fig. 9 Bio-Oss® particles are also added to augment the lateral aspect of the mesial implant, followed by an occlusive bioresorbable membrane (Bio-Gide®) to cover the entire area.



Fig. 12 Upon re-entry after 6 months, a dense osseous tissue inhabits the previous lateral window area.



Fig. 15 The functional osseointegrated implants are surrounded by regenerated bone. The new location of the sinus floor is well established above the augmented area.

Surgical aftercare

- > Anti-inflammatory drug: 6 mg Dexamethasone after 24 h and 3 mg after 48 h
- > Systemic antibiotic: 500 mg Amoxicillin (TID) for 1 week
- > Analgesis: Etodolac 200 mg or Ibuprofen 200 mg - every 6-8 h as needed
- > Antiseptic mouthwash: 0.2 % chlorhexidine gluconate for 30-45 s, 2 / day
- > Suture removal after 14 days
- > Augmentation/implantation on the contralateral sinus - at least one month interval

Sinus floor augmentation



Clinical procedure by Dr. Zvi Artzi, School of Dental Medicine, Tel Aviv University, Israel



> Sinus floor augmentation with lateral access and simultaneous implantation

1. Decision criteria according to Zvi Artzi

Augmentation technique depending on residual bone thickness	<input type="checkbox"/> Standard implantation without augmentation: > 10 mm residual bone height <input type="checkbox"/> Osteotome technique: 7 – 9 mm residual bone height <input checked="" type="checkbox"/> One-stage, lateral access: 4 – 6 mm residual bone height <input type="checkbox"/> Two-stage, lateral access: < 3 mm residual bone height
Addition of autogenous bone	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Implant loading	<input type="checkbox"/> 2 months after augmentation and implantation <input type="checkbox"/> 4 months after augmentation and implantation <input checked="" type="checkbox"/> 6 months after augmentation and implantation

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