

# Rehabilitation With Implants After Bone Lid Surgery in the Posterior Mandible

Stefano Sivolella, DDS, PhD,\* Giulia Brunello, DDS,† Mario Berengo, MD, DDS,‡  
Marleen De Biagi, DDS,§ and Christian Bacci, DDS, PhD||

Bone defects are often secondary to alveolar disease removal. Creating a bone lid with piezosurgery is a valid method to preserve the alveolar bone. A careful and precise osteotomy associated with a firm placement of the bone lid in its original position enables better bone healing, thus allowing for the delayed insertion of dental implants at the operated site with no need for any bone augmentation procedures. The aim of this technical note is to present the application of the bone lid surgery in the posterior mandible before dental implant rehabilitation.

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Fashioning a bone lid involves cutting a window and removing a portion of bone, which is subsequently returned to its original position at the end of the surgical procedure. This technique enables large bone defects secondary to access osteotomies to be avoided. It can be used in several clinical situations, such as the accidental displacement of foreign bodies into the maxillary sinus<sup>1-3</sup> or to gain access to teeth or alveolar bone lesions.<sup>4,5</sup> The removal of lesions, such as cysts or tumors, or impacted teeth from alveolar bone is often associated with residual defects that prevent the use of dental implants without performing augmentation procedures.<sup>6,7</sup> In such cases, the ideal treatment is as conservative as possible to preserve alveolar bone. Bone lid osteotomies can be performed with a microsaw,<sup>5</sup> a long shank drill,<sup>8</sup> or piezosurgery.<sup>2-4,9</sup> Before the osteotomy is completed, the bone window can be pre-plated with microplates to ensure the bone lid's stability after it has been put back in place.<sup>2</sup> Alternatively, small holes can be drilled into the lid and the surrounding bone to allow for the lid to be fixed with resorbable sutures. For precise, thin, beveled osteotomies, a bone lid can even be fitted stably and accurately in place without any need for further fixation.<sup>5</sup>

In a recent prospective study, Khoury<sup>5</sup> described 200 consecutive patients treated using the bone lid

approach during pre-implant and implant surgical procedures. In 124 patients the bone lid was put back in place without any simultaneous implant positioning or bone graft procedures, and the mean alveolar crest width was reportedly  $7.6 \pm 0.8$  mm immediately after reimplantation of the bone lid. Three months later, the alveolar crest was substantially well preserved in most cases (mean width,  $7.1 \pm 1.2$  mm). In another 76 patients, the bone lid was returned to its original position simultaneously with implant insertion and, in some cases, with bone augmentation procedures (depending on the adequacy of the bone volume and any evidence of infection) and normal healing without any infection was observed.

Jung et al<sup>8</sup> treated 10 patients using a modified bone lid technique to remove failed implants. In 3 patients, the implants were replaced immediately. Some changes were made to the original bone lid technique, including the use of grafting materials.

The aim of the present technical note is to illustrate, through 2 clinical cases, the value of the bone lid technique in the treatment of posterior mandibular pathologic conditions. Implant-supported prosthetic rehabilitation is possible in spontaneously regenerated bone in the edentulous posterior mandible after the first surgical bone lid procedure.

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\*Consultant.

†Resident.

‡Full Professor.

§Resident.

||Consultant.

Address correspondence and reprint requests to Dr Brunello:  
Section of Dentistry, Department of Neurosciences, University of

Padova, Via Giustiniani 1, 35129 Padova, Italy; e-mail: [giulia-bru@libero.it](mailto:giulia-bru@libero.it)

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The patients were fully informed about their condition and consented to the clinical and surgical procedures, which included taking photographs of the lesions and procedures. The procedures described complied with the World Medical Association Declaration of Helsinki on medical research protocols and ethics.

## Report of Cases

### CASE 1

A healthy 64-year-old male patient presented with an extensive radiolucent lesion in the posterior portion of the left mandible that apparently extended from the roots of an endodontic-treated third molar. The patient was clinically asymptomatic and the lesion was an incidental radiographic finding (Fig 1). After preoperative computed tomography (Fig 2), surgery was performed under local anesthesia and sedation.<sup>10</sup> A crestal incision was made within the keratinized gingiva in the edentulous mesial area and extended within the sulcus to left mandibular third molar and a distal releasing incision was made. A mucoperiosteal flap was reflected buccally and the third molar was extracted. Adequate access to the lesion was assured by a buccal bone lid fashioned using a piezoelectric device

(Piezosurgery, Mectron SpA, Carasco, Italy; insert OT7; Fig 3A). After its removal, the bone lid was placed in sterile saline solution. The pathologic tissue was removed from the surgical site, leaving the inferior alveolar nerve intact (Fig 3B). No filling material was used. The buccal bone lid was returned to its original position and stabilized with 1.3-mm fixation microplates (Synthes GmbH, Oberdorf, Switzerland; Fig 3C). The flap was put back in place and sutured. The histopathologic findings were consistent with a radicular cyst, confirming the clinical and radiologic preoperative diagnosis. One year after removing the cyst, healing and spontaneous filling of the residual cavity were confirmed on postoperative orthopantomogram (Fig 4) and computed tomogram (Fig 5). There were no signs of recurrent cyst. The fixation plates were removed (1 year after their insertion) and 3 1-stage implants (XiVE S, DENTSPLY Friadent, Mannheim, Germany) were inserted using a surgical guide at the same time (Fig 6).

The patient was referred back to his dentist for prosthetic rehabilitation. He was fitted with a provisional metal-and-acrylic fixed prosthesis 4 months after implant surgery and with a permanent cemented metal-and-ceramic prosthesis after 10 months (Fig 7A, B). The patient was followed with annual



**FIGURE 1.** Case 1. Preoperative orthopantomogram shows a roundish well-defined radiolucent lesion apically to the left mandibular third molar.

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