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## TREATMENT OF CLASS IV HORIZONTAL BONE DEFECTS

According to Benic and Hämmerle, Class IV bone defects encompass clinical situations where a horizontal augmentation protocol with delayed implant placement is required. Using the collagenic cortical bone barrier OsteoBiol® *Lamina*® in combination with OsteoBiol® *mp3*®, a team of German dentists preserved the graft volume and regenerated an appropriate amount of new bone to insert implants six months after the surgery<sup>(1)</sup>.

Similar results were reported by a team of Italian researchers in a case study on 20 patients<sup>(2)</sup>.

Before surgery, patients underwent a session of oral hygiene. Mepivacaine 20 mg/mL + adrenaline 1:100,000 was injected at the beginning of the surgery. A bucco-lingual crestal incision and an intrasulcular incision were made on the edentulous area and the adjacent tooth, respectively.

A full-thickness flap was elevated at both the buccal and the lingual site.

Multiple cortical perforations were performed using a diamond drill to stimulate bleeding.

An OsteoBiol® *Soft Cortical Lamina*® (1 mm) was adapted to the size of the defect and then fixed with two osteosynthesis screws to reconstruct the missing bone wall. OsteoBiol® *mp3*® was grafted in between the pristine bone and the lamina; subsequently, the defect was covered with an OsteoBiol® *Evolution* collagen membrane.

Flaps were sutured using single stitches, and implants were inserted in the newly formed bone 8 months after the surgery.

Histological analysis of a biopsy retrieved 8 months after the surgery showed that the lamina was perfectly integrated with the newly formed bone. All implants survived at the second follow-up two years after the surgery.

## TREATMENT OF KNIFE-EDGE RIDGES

Knife-edge ridges are defects characterized by severe horizontal bone resorption. In this clinical scenario, not only a biomaterial is required to act as a scaffold to regenerate bone horizontally, but also a barrier is necessary to maintain the graft in close contact with the pristine bone. Titanium meshes are valid options to treat knife-edge ridges; however, patients undergo an additional surgery to remove the mesh.

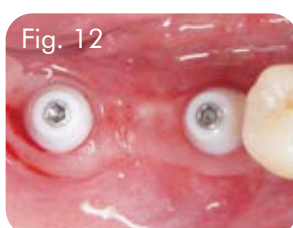
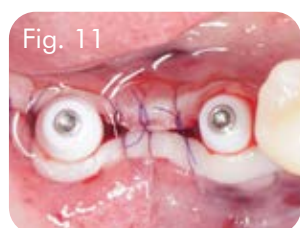
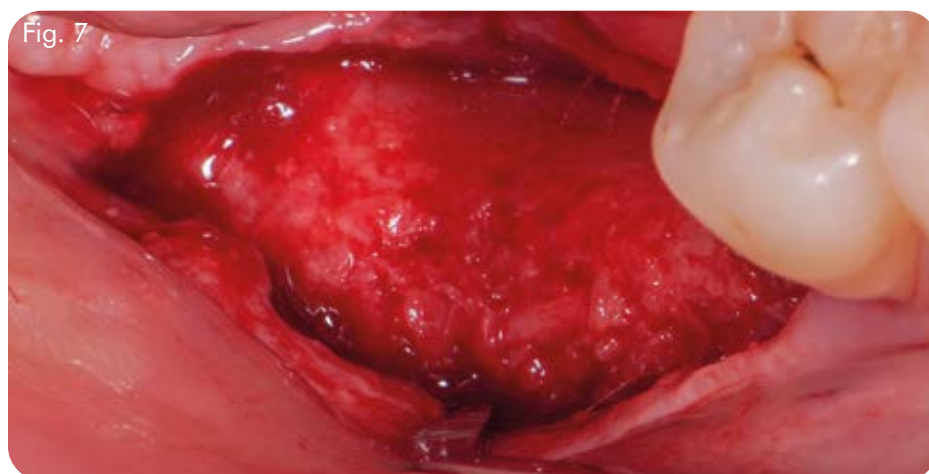
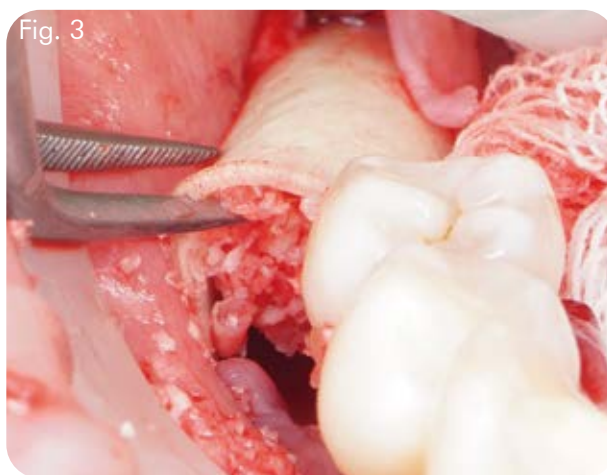
Slowly resorbable collagenic cortical bone barriers such as OsteoBiol® *Curved Lamina*® (1 mm) were proven to be a valid option for reconstructing knife-edge ridges<sup>(3)</sup>. Thanks to its curved shape, OsteoBiol® *Curved Lamina*® can be easily used to reconstruct the missing buccal bone and, at the same time, can be bent over the graft. Moreover, OsteoBiol® *Curved Lamina*® acts as a selective cellular barrier in preventing epithelial cells from colonizing the graft.

Under local anaesthesia using articaine 2% with adrenaline 1:200.000, a 12c blade was used to open a full-thickness buccal and lingual flap exposing the underlying bone.

OsteoBiol® *Curved Lamina*® was adapted to the anatomy of the defect and then inserted in between the bone and the flap without hydrating it.

The buccal and lingual flap was mobilized at this point to get a passive closure and avoid tension. Subsequently, OsteoBiol® *Gen-Os*® was inserted to fill the gap between the ridge and the cortical bone barrier. OsteoBiol® *Curved Lamina*® was bent over the graft to cover it, and the flap was closed with mattress sutures. Page 9 shows a clinical case with OsteoBiol® *Curved Lamina*® (1 mm). OsteoBiol® *Curved Lamina*® should be fixed with osteosynthesis screws or titanium tacks<sup>(4)</sup>

# Horizontal and vertical GBR on knife-edge ridges of the mandible



Sex: **male** | Age: **61**

**Fig. 1** Occlusal view of the posterior mandible area reveals a knife edge ridge and both horizontal and vertical collapse

**Fig. 2** Autogenous particulate bone mixed with porcine cortico-cancellous bone mix OsteoBioL® Gen-Os®

**Fig. 3** Graft placed to fill the edentulous area for augmentation under dry OsteoBioL® Lamina®

**Fig. 4** Flaps secured on top of OsteoBioL® Lamina® using resorbable horizontal mattress sutures

**Fig. 5** Soft tissues sutured with double simple 6/0 sutures

**Fig. 6** Intraoral view after 6 months

**Fig. 7** After 6 months following augmentation (in the second stage) increase of the bone width on the buccal-lingual aspect and the bone normal quality is observed

**Fig. 8** Two standard diameter implants placed with good primary stability

**Fig. 9** Implants were had been left in situ for two months before proceeding to the next stage. Soft tissues sutured with double simple 6/0 sutures

**Fig. 10** Implants exposed and the cover-screws replaced with multi-unit abutments

**Fig. 11** Soft tissue augmentation performed to optimize and protect the augmented area. Epithelial embossed connective tissue graft was sutured on buccal aspect of the implants

**Fig. 12** Tissue healing after 2 weeks

**Fig. 13** Periapical radiograph, 8 months after the first stage of surgery

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Bone substitutes: **OsteoBioL® mp3®**  
**OsteoBioL® Lamina®**