

An intraoperative photograph showing a dental procedure. A metal mesh with a grid-like pattern of rectangular openings is being placed over a bone graft site. The mesh is held in place by a yellow surgical instrument. The underlying bone and soft tissue are visible, showing a reddish, vascularized appearance. The mesh is positioned over a large, irregularly shaped area of bone graft material.

A CASE REPORT BY  
PROF. MATTEO CHIAPASCO  
DR. GRAZIA TOMMASATO

3D Bone Augmentation Using  
CAD/CAM Technology, Biomaterials  
and Autologous Bone



## ► The Situation

A 75 year-old systemically healthy female came to our attention presenting with absent mandibular second bicuspids and molars and requiring a fixed rehabilitation supported by implants as she refused a removable solution. The clinical and radiographic evaluation showed a relevant vertical and horizontal bone atrophy of such an extent that short or narrow implants were not considered a reliable option. The patient smoked <10 cigarettes per day.

## ► The Risk Profile

Esthetic Risk Factors	Low Risk	Medium Risk	High Risk
Patient's health	Intact immune system	Light smoker	Impaired immune system
Patient's esthetic requirements	Low	Medium	High
Height of smile line	Low	Medium	High
Gingival biotype	Thick - "low scalloped"	Medium - "medium scalloped"	Thin - "high scalloped"
Shape of dental crowns	Rectangular		Triangular
Infection at implant sight	None	Chronic	Acute
Bone height at adjacent tooth site	≤ 5 mm from contact point	5.5 - 6.5 mm from contact point	≥ 7 mm from contact point
Restorative status of adjacent tooth	Intact		Restored
Width of tooth gap	1 tooth (≥ 7 mm)	1 tooth (≤ 7 mm)	2 teeth or more
Soft tissue anatomy	Intact		Compromised
Bone anatomy of the alveolar ridge	No defect	Horizontal defect	Vertical defect

Note: Yxoss CBR® by ReOss® Screws 5mm – MCbio (G-fix system)

SPECIAL  
INTEREST

Guided Bone  
Regeneration

*“While it is important to be an expert in guided bone regeneration, this technique reduces the difficulties to less than one-half and is predictable, effective, and precise.*

*Prof. Matteo Chiapasco*

### **MATTEO CHIAPASCO DDS. MD., MILAN, ITALY**

Graduated in Medicine and specialized in Maxillofacial Surgery at the University of Milan, Italy. Professor, Unit of Oral Surgery, University of Milan; Associate Professor, Loma Linda University, Los Angeles, California, USA.

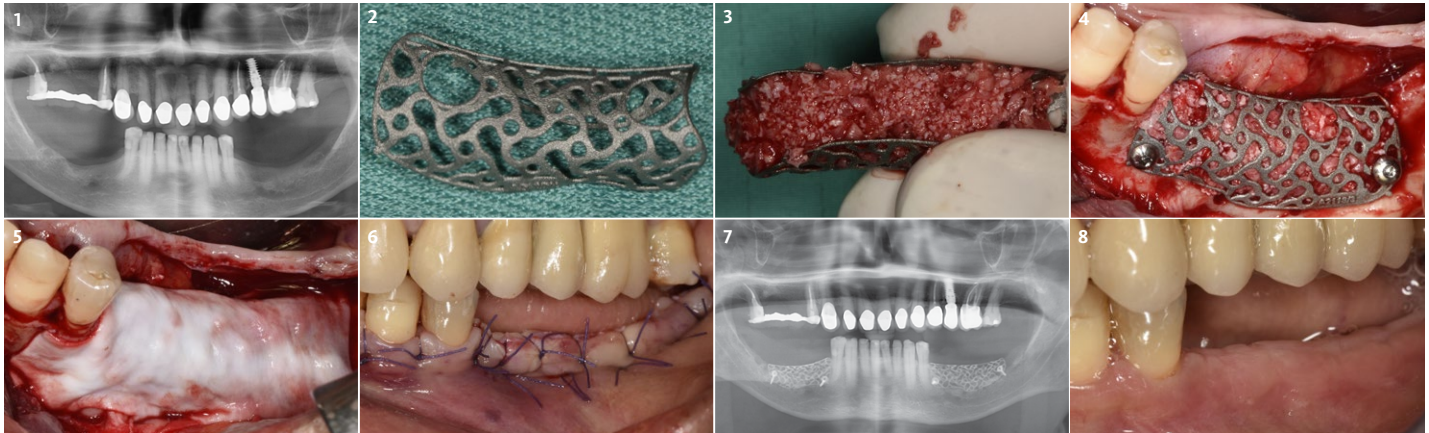
### **GRAZIA TOMMASATO DDS. MSC., MILAN, ITALY**

Graduated in Dentistry in 2013, specialized in Oral Surgery at the University of Milan magna cum laude. PhD student and a medical consultant of the Clinical Unit of Oral Surgery (“G. Vogel” Clinic, Milan).



## ► The Approach

The main goal was to obtain a horizontal and vertical reconstruction of the deficient alveolar bone in order to allow safe and prosthetically-guided implant placement. Reconstruction was obtained by means of a customized titanium mesh, Yxoss CBR®, in combination with a mixture of autologous bone chips harvested from the mandibular ramus and bovine bone mineral, Geistlich Bio-Oss®.



- 1 Panoramic radiograph of initial situation showing the atrophic mandibular areas.
- 2 The final Yxoss CBR® ready for use.
- 3 The customized Ti-mesh is filled with the autologous bone chips mixed with Geistlich Bio-Oss® granules in a 50:50 ratio.
- 4 Intra-operative view at the end of the reconstruction showing the bone augmentation: the customized mesh was stabilized with 2 fixation screws.
- 5 A Geistlich Bio-Gide® membrane is used to cover the customized mesh in order to increase the barrier effect.
- 6 Intra-operative view after primary closure of the surgical wound.
- 7 Panoramic radiograph after surgery.
- 8 Clinical control 3 months later showing favorable healing of the soft tissue and correction of the defect.

### GUIDED BONE REGENERATION

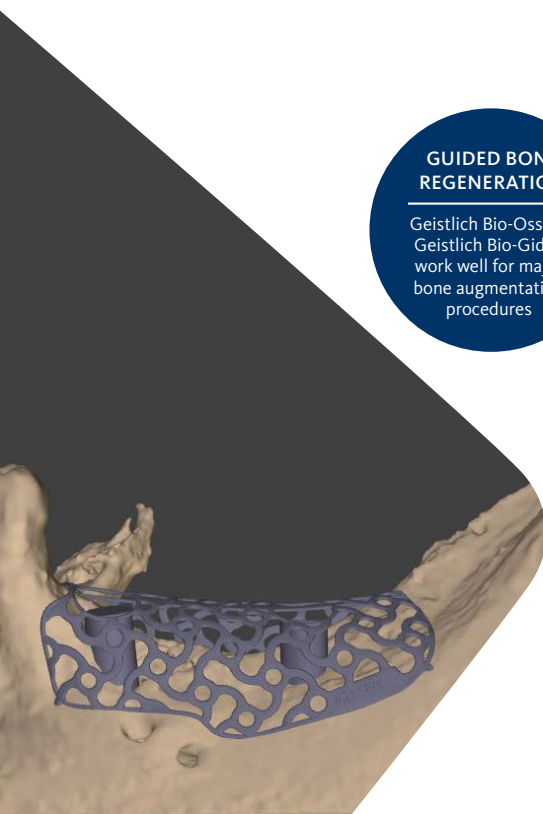
Geistlich Bio-Oss® & Geistlich Bio-Gide® work well for major bone augmentation procedures

*“The 3-dimensional reproduction of the left edentulous area permits the production of a precise and customized Ti-mesh.”*

*(See image to the left)*

## ► The Outcome

Post-operative recovery of this patient was uneventful, no complications such as dehiscence or late exposure of the customized mesh, with complete correction of the initial defect. The Yxoss CBR® allowed an easy and faster reconstruction thanks to the precision of the prefabricated mesh filled with autologous chips, Geistlich Bio-Oss® and Geistlich Bio-Gide®.



# Briefly Speaking

## ► Keys to Success

1. Precise pre-operative radiographic evaluation and accurate pre-visualization of the final shape of the customized mesh
2. The Yxoss CBR® must be fixed with Titanium micro-screws
3. Regeneration with autologous bone chips mixed with Geistlich Bio-Oss® granules
4. Resorbable collagen membrane, Geistlich Bio-Gide®, in order to optimize the barrier effect
5. It is mandatory not to load with a removable prosthesis during healing



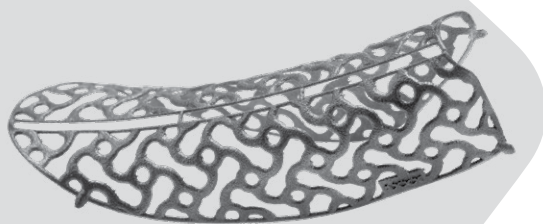
*“GBR combining the use of Geistlich Bio-Oss®, autologous bone chips taken from the mandibular ramus associated with a customized Yxoss CBR®, covered with a Geistlich Bio-Gide®, is a predictable regenerative procedure allowing for the creation of an adequate volume suitable for a prosthetically-guided implant placement with optimization of the final restoration”.*

*Prof. Matteo Chiapasco*

## ► My Biomaterials

Geistlich Bio-Oss® protects human bone grafts against degradation, Geistlich Bio-Gide® provides a barrier function long enough to protect the newly forming bone from soft tissue ingrowth and provides support for wound healing.

**Yxoss CBR®**  
manufactured by  
ReOss®



Geistlich Bio-Oss® provides long-term volume and stability



Geistlich Bio-Gide® acts as a barrier and supports wound healing



**Click here to view the webinar**

**Geistlich Pharma North America, Inc.**

Princeton, NJ 08540

Customer Care Toll-free: 855-799-5500

info@geistlich-na.com

dental.geistlich-na.com

## ABOUT BIOBRIEF

We know that exposure to new or refined treatment approaches brings innovation to practice. Geistlich Biomaterials is pleased to introduce a periodic opportunity to get up close and personal with creative clinicians from around the world. Focused on peer-to-peer exchange, BIOBRIEF features clinically relevant cases and techniques in specific therapeutic areas – highlighted with valuable insights about materials and instrumentation, as well as KEYS TO SUCCESS.

Geistlich Biomaterials – bringing you *regeneration on time*.

## ► The Therapeutic Area

Geistlich biomaterials can play a significant role in the treatment of Major Bone Augmentation. Geistlich Bio-Oss® provides a stable scaffold for bone formation leading to long-term volume preservation, while Geistlich Bio-Gide® ensures undisturbed bone regeneration and prevents soft tissue ingrowth.



**CAUTION:** Federal law restricts these devices to sale by or on the order of a dentist or physician.

**Indications:**

Geistlich Bio-Oss® is indicated for the following uses: Augmentation or reconstructive treatment of the alveolar ridge; Filling of periodontal defects; Filling of defect after root resection, apicoectomy, and cystectomy; Filling of extraction sockets to enhance preservation of the alveolar ridge; Elevation of the maxillary sinus floor; Filling of periodontal defects in conjunction with products intended for Guided Tissue Regeneration (GTR) and Guided Bone Regeneration (GBR); and Filling of peri-implant defects in conjunction with products intended for GBR.

**Warnings:**

Possible complications which may occur with any surgery include swelling at the surgical site, flap sloughing, bleeding, local inflammation, bone loss, infection or pain.

**Indications:**

Geistlich Bio-Gide® is indicated for the following uses: Augmentation around implants placed in immediate and delayed extraction sockets; Localized ridge augmentation for later implantation; Alveolar ridge reconstruction for prosthetic treatment; Filling of bone defects after root resection, cystectomy, removal of retained teeth; GBR in dehiscence defects; and GTR procedures in periodontal defects.

**Warnings:**

As it is a collagen product, allergic reactions may not be totally excluded. Possible complications which may occur with any surgery include swelling at the surgical site, flap sloughing, bleeding, dehiscence, hematoma, increased sensitivity and pain, bone loss, redness, and local inflammation.

For more information on contraindications, precautions, and directions for use, please refer to the Geistlich Bio-Oss® and Geistlich Bio-Gide® Instructions for Use at:  
[www.dental.geistlich-na.com/ifu](http://www.dental.geistlich-na.com/ifu)