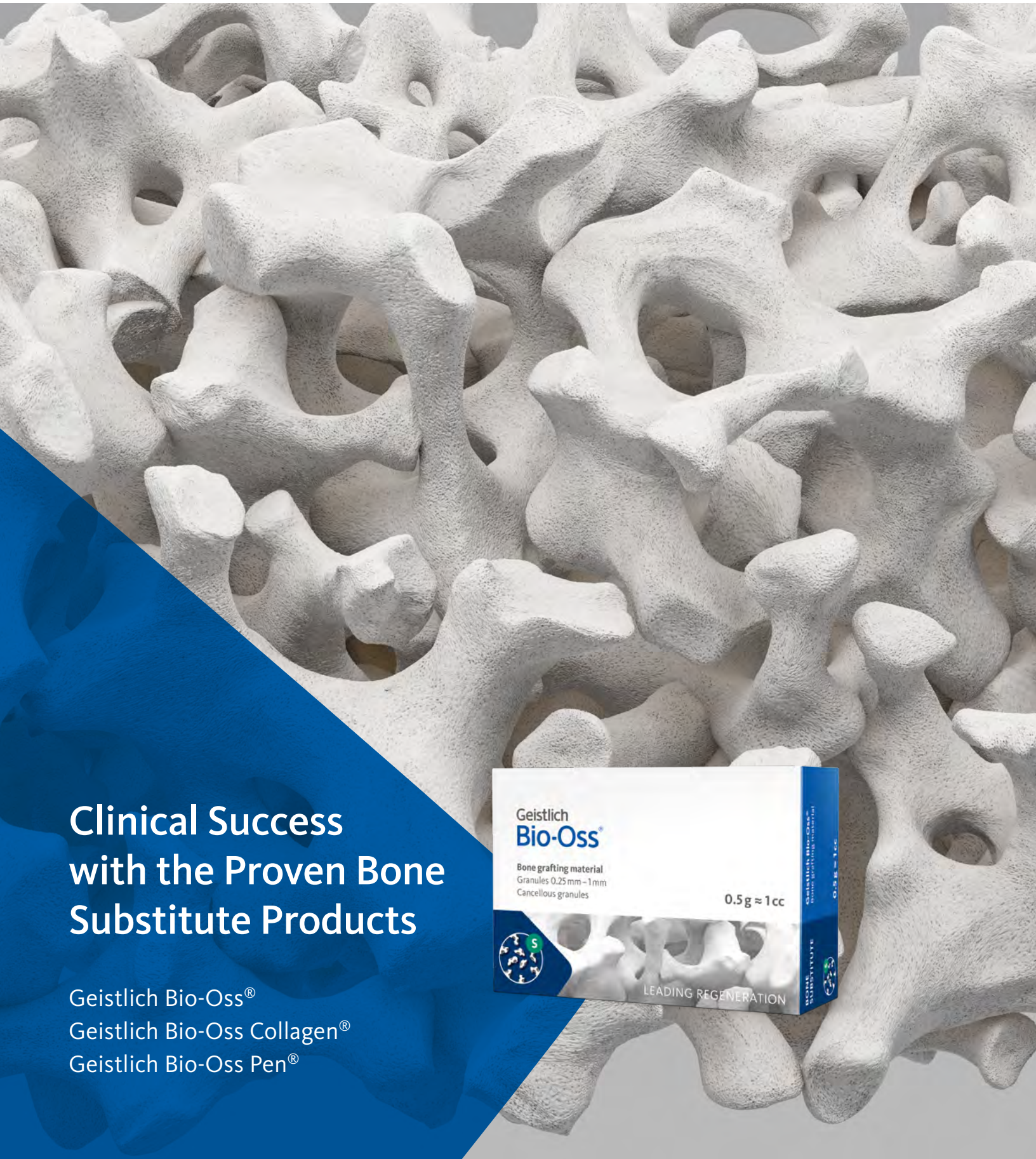
LEADING REGENERATION

Geistlich
Biomaterials



Clinical Success with the Proven Bone Substitute Products

Geistlich Bio-Oss®
Geistlich Bio-Oss Collagen®
Geistlich Bio-Oss Pen®

Geistlich
Biomaterials

Elevating patient care is what drives your choice of professional partners and products. That's why Geistlich Biomaterials brings you a full range of regenerative treatment options that you can use with absolute confidence.

Product reliability, time-tested manufacturing and the commitment of our people come together to create bonds like no other.

EXACTLY
like no other.

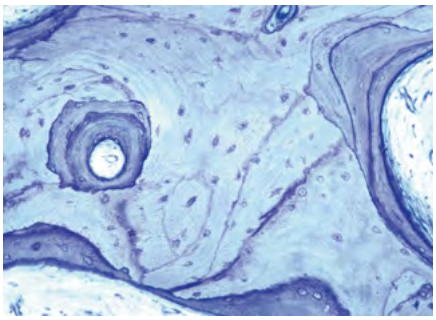
Geistlich Bio-Oss®

Principles Come First

Geistlich Biomaterials has a history of quality built upon scientific collaboration and manufacturing excellence.

These are the principles that guided the development of our signature bone substitute over 30 years ago. Since then, Geistlich Bio-Oss® has continually reshaped clinical possibilities and elevated the standard of care for oral regenerative treatment worldwide.

Every Geistlich biomaterial is intentionally designed for a specific application and carefully engineered to preserve its natural structures. Today, our full product portfolio of Bone Substitutes, Membranes and Matrices increases clinical flexibility and expands treatment options in a wide variety of therapeutic areas.



Histology depicts Geistlich Bio-Oss® incorporated and functionally integrated into living bone.

Courtesy of Prof. Dr. Georg-Hubertus Nentwig, Frankfurt, Germany.

Molecular interactions between Geistlich Bio-Oss® particles and both organic and inorganic constituents of bone can provide a bonding mechanism for maintaining the biomechanical integrity of bone/biomaterial during remodeling, repair, and osseointegration. The most peripheral osteocytic lacunae present in Geistlich Bio-Oss® appear to be filled by osteocytes. Geistlich Bio-Oss® is incorporated and functionally integrated into living bone.

The Ideal Biomaterials for Regeneration

These proven and reliable products provide a foundation for long-term clinical success in regenerative dentistry.

Our product lines include:

Bone Substitutes
- Geistlich Bio-Oss®
- Geistlich Bio-Oss Collagen®
- Geistlich Bio-Oss Pen®

Membranes
- Geistlich Bio-Gide®
- Geistlich Bio-Gide® Compressed
- Geistlich Bio-Gide® Shape
- Geistlich Bio-Gide® Perio

Matrices
- Geistlich Mucograft®
- Geistlich Mucograft® Seal
- Geistlich Fibro-Gide®

Combination Products
- Geistlich Combi-Kit Collagen
- Geistlich Perio-System Combi-Pack

What's Essential to Success

In the production of Geistlich Bio-Oss®, derived from bovine bone, these complex tissues are reduced to their essential form. The native crystalline structure, which is highly similar to human bone, is preserved through our unique, patented technology.

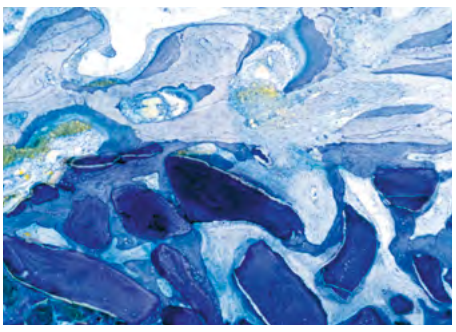
Geistlich Bio-Oss®

Human Bone

This ensures that the vital building blocks are present to promote the initial biologic processes of cell adhesion and proliferation. The slow resorbing nature of Geistlich Bio-Oss® is a desirable characteristic providing long-term volume preservation and as the body recognizes and accepts these native crystalline structures, the particles become fully integrated into living bone. It is the sum of these characteristics that defines the biofunctionality of Geistlich Bio-Oss® and is the basis for its long-term clinical success.

Volume Preservation

Geistlich Bio-Oss® becomes fully integrated into living bone over time to maintain space and preserve regenerative volume.[1,2]



Geistlich Bio-Oss® continues to build on more than 30 years of clinical success. Geistlich's long-term commitment to evidence and innovation is well-documented in more than 1,000 publications, making Geistlich Bio-Oss® the most successful bone substitute worldwide.[3,4] Through its unique properties and reliable clinical outcomes, Geistlich Bio-Oss® remains the essential choice among an expanding range of therapeutic areas.

The Building Blocks

Geistlich Bio-Oss® is readily adapted to the natural modeling and remodeling process.

Topographic Structure:

› The unique and interconnecting porous structure supports optimal ingrowth for bone formation

Hydrophilic Properties:

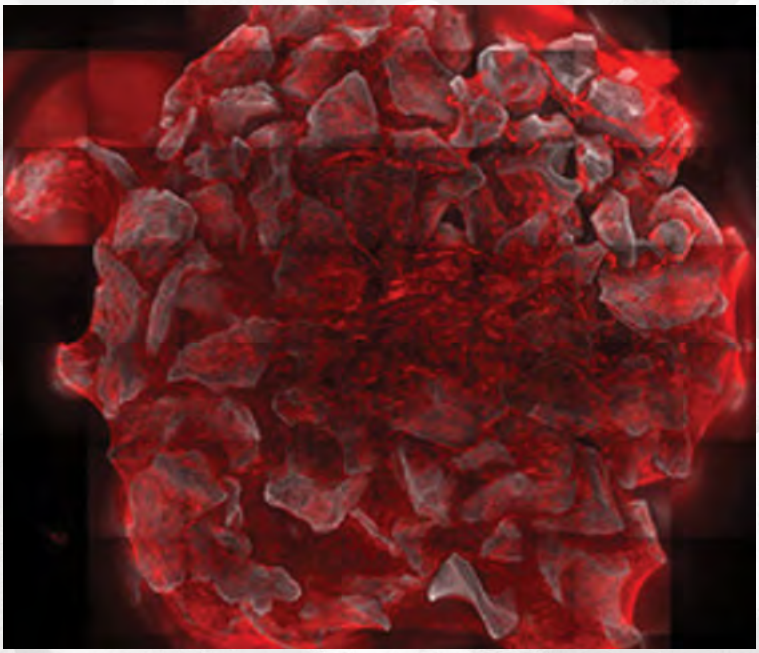
› Allows for effective blood clot stabilization[5] and the adsorption of proteins enabling the adhesion of osteoblasts

Biological Interaction:

› Cellular events lead to improved osteoconduction, bone formation and quality[6]

When barrier function is also needed, Geistlich Membranes are a natural companion to our bone substitute product line*

* Additional information regarding indications for Geistlich Bone Substitutes can be found on the back panel of this brochure.

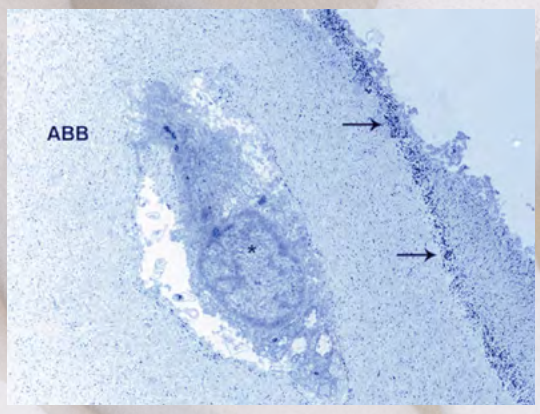


Bone precursor cells, whose cytoskeletons have been stained red, grow on Geistlich Bio-Oss® particles. Over time the cells form an extracellular matrix on the scaffold. The extracellular matrix unites the Geistlich Bio-Oss® particles to form a solid clot. (Ed.)

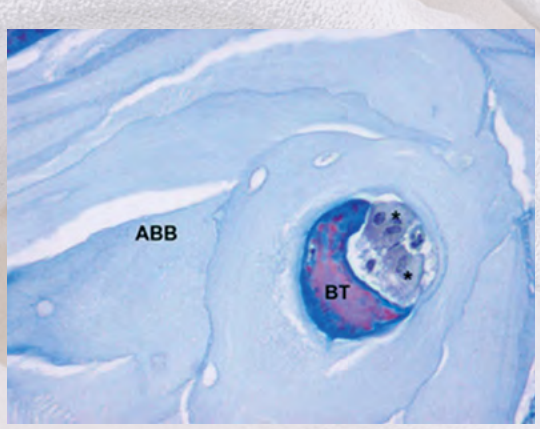
Matrix Deposition

Photo: Geistlich Pharma AG

1 Galindo-Moreno, P. et al. (2014). Clin Oral Implants Res. 25(3):366-71.
2 Araújo, MG. et al. (2010). Clin Oral Implants Res. 21(1):55-64.
3 iData Research Inc., US Dental Bone Graft Substitutes and other Biomaterials Market, 2012.
4 iData Research Inc., European Dental Bone Graft Substitutes and other Biomaterials Market, 2010.
5 Degidi, M. et al. (2006). Oral Dis. 12(5): 469–75.
6 Erisson, C. et al. (1977). Clin Othop Relat Res. (128):351.



Ultrastructural demonstration of anorganic bovine bone (ABB) osteocyte lacunae colonization by viable cell (*) (TEM x4600). (ABB, ABB particles; arrows, cement line).[1]



Bone tissue (BT) and osteoclasts cells (*) inside ABB particles (Masson trichrome x400).[1]

For Volume Preservation, Time = Quality.

Due to the unique crystalline structure of Geistlich Bio-Oss®, the body sees it as native bone without eliciting a foreign body reaction. As demonstrated in the histological images above, Geistlich Bio-Oss® particles are incorporated over time within living bone which maintains the desired shape and preserves volume.[1-6] Together with the newly formed bone, it also participates in functional load bearing over time.

Structure

Ideal environment for forming new bone[7]

Geistlich Bio-Oss® consists of a unique inter-connecting pore system. The micropores ensure an efficient fluid intake. The macropores permit the migration of cells.

The pore system and surface morphology of Geistlich Bio-Oss® encourages the growth of osteoblasts. The porous structure serves as a scaffold for in-growing blood vessels and bone growth.

Integration

Stable scaffold for new bone[2, 8-10]

Osteoconductivity and porosity are required properties for a scaffold to be successful in bone regeneration. These properties in Geistlich Bio-Oss® enhance bone formation, angiogenesis and the supporting attachment and proliferation of osteoblasts. Over time Geistlich Bio-Oss® is integrated into the natural bone remodeling process. Geistlich Bio-Oss® and the newly formed bone make a stable scaffold which results in long-term clinical success.

Clinical Long-Term Success

Clinical long-term success starts with bone density

The slow resorption of Geistlich Bio-Oss® promotes the long-term volume stability[11] of the augmentation material and ensures high implant survival rates.[12] The use of Geistlich Bio-Gide® in combination with Geistlich Bio-Oss® results in significantly more bone formation and greater bone density.[13]

1 Galindo-Moreno, P. et al. (2014). Clin Oral Implants Res. 25(3): 366-71.
2 Orsini, G. et al. (2005). J Biomed Mater Res B Appl Biomater 74(1):448–57.
3 Araújo, MG. et al. (2010). Clin Oral Implants Res. 21(1): 55-64.
4 Lindhe, J. et al. (2014). Clin Oral Implants Res. 25(7): 786-90.
5 Buser, D. et al. (2013). J Periodontol. 84(11): 1517-27.
6 Araújo, M. et al. (2008). Int J Periodontics Restorative Dent. 28(2): 123-35.
7 Berglundh, T. et al. (1997). Clin Oral Implants Res. 8(2): 117–124.
8 Piattelli, M. et al. (1999). Int J Oral Maxillofac Implants. 14: 835-40.
9 Sartori, S. et al. (2003). Clin Implants Res. 14: 369–72.
10 Traini, T. et al. (2007). J Periodontol. 78(5): 955–961.
11 Mordenfeld, A. et al. (2010). Clin Oral Implants Res. 21(9):961–70.
12 Jung, R. et al. (2013). Clin Oral Implants Res. 24(10):1065–73.
13 Kim, M. et al. In Vivo (2008). 22(2): 231-6.

Treatment in the Maxilla with Geistlich Bio-Oss®

Geistlich Bio-Oss® has been found to provide more stable radiographic bone fill than autologous bone.[4]

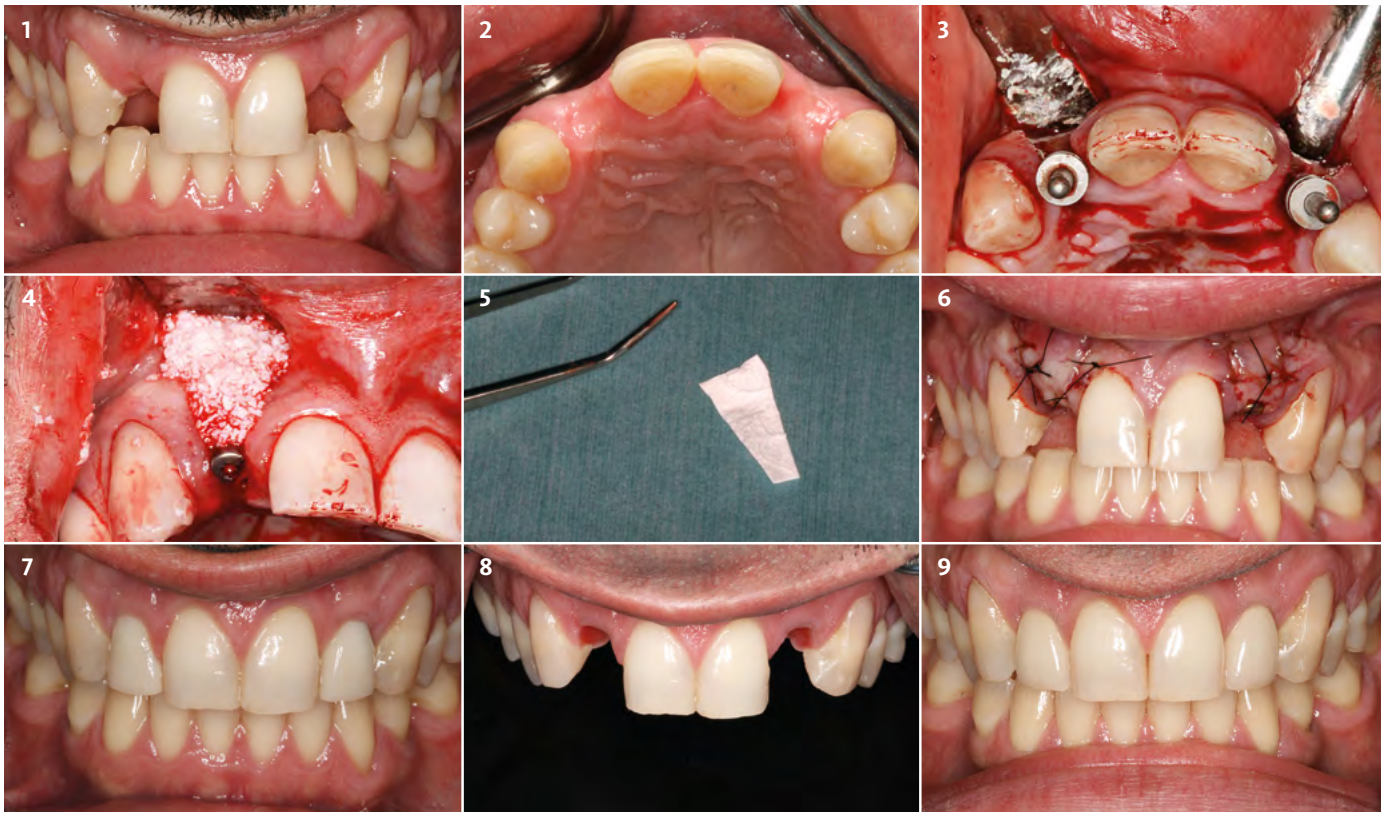
Dr. Avinash Bidra | Farmington, CT, USA

5-9 Years

Predictably preserves facial bone wall[1-3]

Objective: Preserve existing soft tissue architecture, improve the facial contour, and harmonize esthetics and function.

Conclusion: Implant placement and horizontal bone augmentation procedures utilizing Geistlich Bio-Oss® in combination with Geistlich Bio-Gide®, were successful in the treatment of bilateral congenitally missing maxillary lateral incisors.



1 Frontal view revealed adequate contours of soft-tissue especially in gingival height and presence of interdental papilla which needed to be preserved.

2 Occlusal view revealed an obvious lack of buccal contour indicating the need for bone grafting.

3 The guide pins indicating adequate parallelism with adjacent teeth and slightly palatal location of the planned implant platform.

4 Buccal view of the narrow diameter implant and of the grafted site with a mixture of autologous bone chips and Geistlich Bio-Oss®.

5 Geistlich Bio-Gide® was trimmed to match the trapezoidal flap design and placed over the graft material.

6 Healing abutments of 3.5 mm in height were placed on both implants for single stage healing. The surgical flaps were sutured with 5-0 nylon sutures and 5-0 resorbable PGA sutures.

7 After a 3 month healing period, the implants were osseointegrated and then screw-retained provisional crowns were fabricated over both implants. The soft-tissues showed an excellent response to the bone graft materials.

8 The soft-tissues around the implants demonstrate excellent maturation and support, especially in the interdental papilla region which was preserved during surgery.

9 Frontal close-up view of the implant restorations 1 year after surgery shows pleasing dental and gingival esthetics.

Treatment in the Mandible with Geistlich Bio-Oss®

Geistlich Bio-Oss®

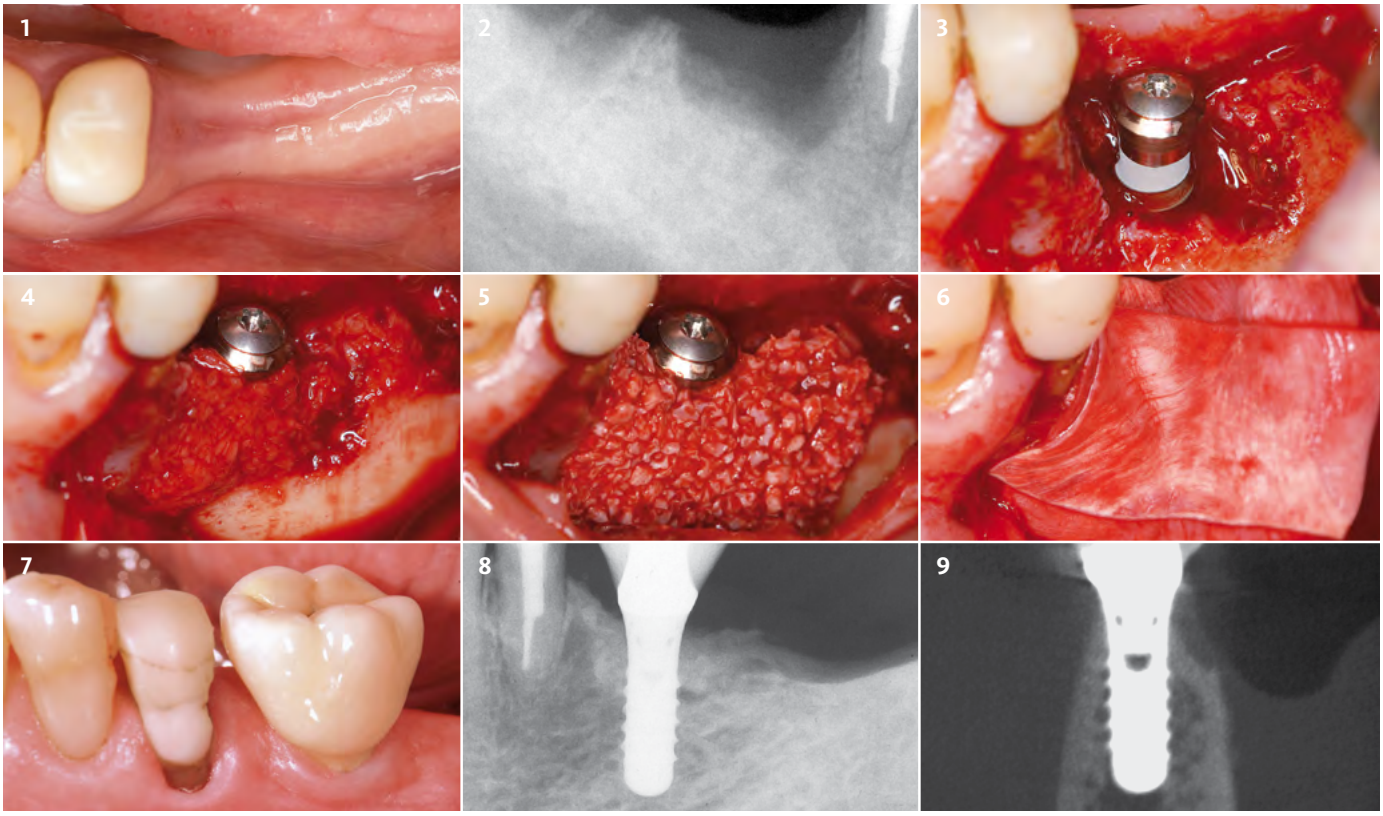
Unique properties make Geistlich Bio-Oss® the ideal biomaterial for long-term volume preservation.

Professor Daniel Buser | Berne, Switzerland

96%
Implant survival rate with Geistlich Bio-Oss® and Geistlich Bio-Gide®[5]

Objective: Correction of bone defects at the implant site to gain circumferential bone anchorage in the alveolar ridge for long-term implant success.

Conclusion: Geistlich Bio-Oss® has the critical function of preserving long-term bone volume. Geistlich Bio-Gide® fulfills the vital barrier function and stabilizes the applied bone filler.



1 Clinical situation after the extraction of tooth #18 and #19.

2 Local bone defect in the region of tooth #19.

3 Buccal bone defect with dual-walled morphology.

4 Clinical situation after implant placement and the defect is filled with autologous bone chips.

5 Geistlich Bio-Oss® is applied on top of the bone chips.

6 A double layer of Geistlich Bio-Gide® covers the graft material.

7 Stable clinical situation after 11.5 years.

8 Radiograph at 11.5 years showing stable bone level.

9 The CBCT image shows an intact buccal bone wall after 11.5 years.

1 Chan, HL. et al. (2014). J Periodontol. 85(8):1027-41.
2 Aghaloo, TL. et al. (2007). Int Journal of Maxillofac Implants: 22: 49–70.
3 Buser, D. et al. (2013). J Periodontol. 84(11):1517–27.
4 Jensen, SS. et al. (2014). J Periodontol. 85(11):1549–56.
5 Buser, D. et al. (2013). J Dent Res. 92(12 Suppl):176S–82S.

Geistlich Bio-OssCollagen®

Optimal Application and Handling

- Addition of 10% porcine collagen enhances handling characteristics
- Ability to tailor the material to the defect morphology
- Versatility to treat a wide range of defects

Clinical Benefits

- Promotes bone regeneration resulting in good soft tissue esthetics[1]
- Volume preservation is achieved due to slow resorption[2]
- Clinical improvement of pocket depth (PD) and clinical attachment level (CAL)[3]
- Regeneration of the complete periodontium[4]

For a closer look, visit:
bio-osscollagen.geistlich-na.com

Treatment in the Maxilla with Geistlich Bio-Oss Collagen®

Geistlich Bio-Oss Collagen® is the ideal biomaterial in the treatment of extraction sockets for ridge preservation, due to its enhanced handling characteristics.[1-3]

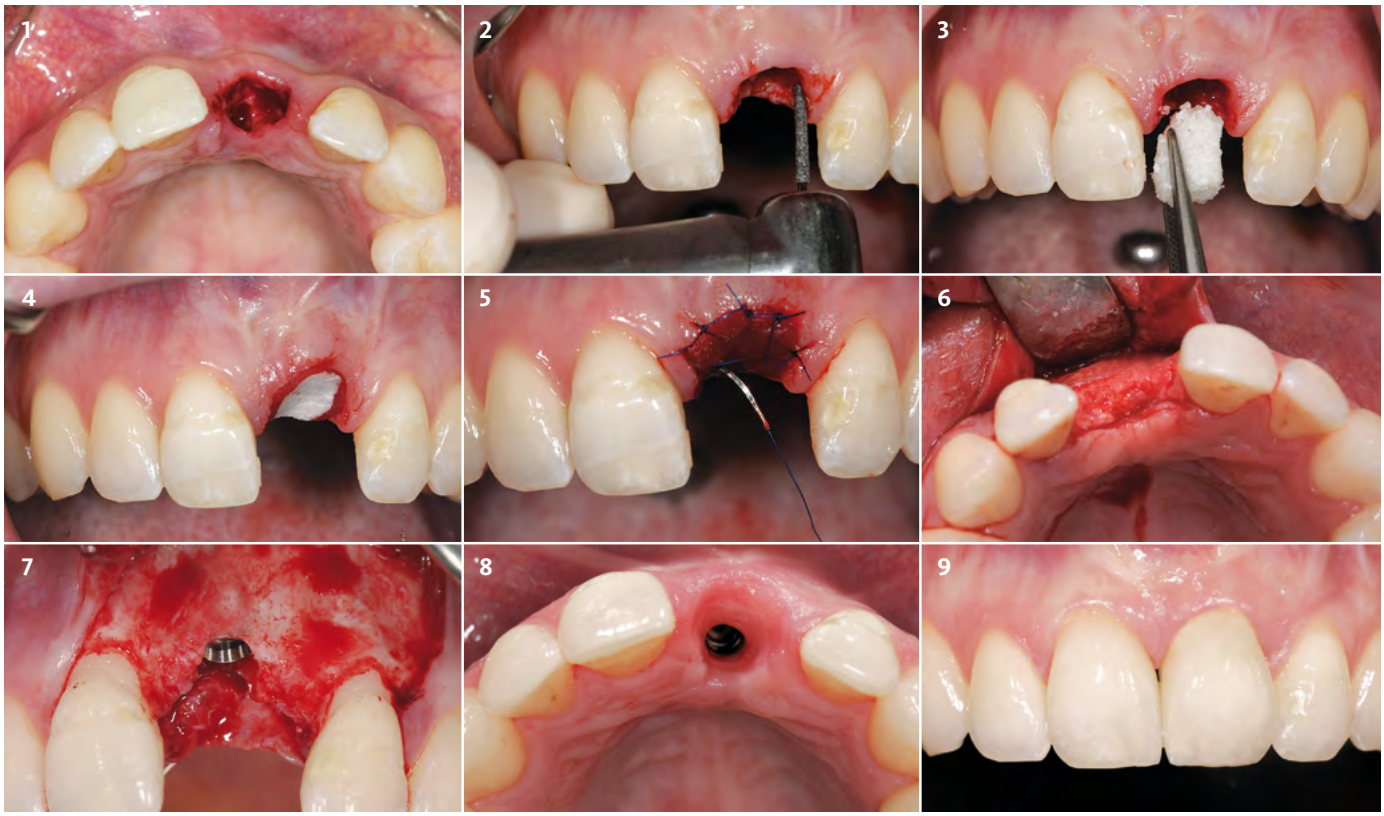
Prof. Dr. Ronald E. Jung | Zurich, Switzerland

10%

Highly purified porcine collagen added to Geistlich Bio-Oss®

Objective: Preserve hard and soft tissue volume after extraction in the anterior region for late implant placement.

Conclusion: Volume of hard and soft tissue can be preserved better with Geistlich Bio-Oss Collagen® and Geistlich Mucograft® Seal than with spontaneous healing.[1]



1 Occlusal view of the socket after tooth extraction. No flaps are raised around the affected area. A slight buccal bone defect was observed

2 The socket is gently curetted for removal of granulation tissue. Subsequently, the wound margins were de-epithelialized with a diamond burr in a hand-piece with irrigation.

3 Filling of the extraction socket with Geistlich Bio-Oss Collagen® to the level of the palatal bone.

4 Geistlich Mucograft® Seal is applied dry and adapts perfectly to the wound margins.

5 Suturing of Geistlich Mucograft® Seal with 6-0 single interrupted sutures.

6 Flap elevation shows the healed bony situation 7.5 months after ridge preservation.

7 Implant placement in fully mature bone. A small guided bone regeneration procedure for contouring is performed.

8 Excellent emergence profile after 10 months.

9 Situation with the final restoration 10 months after tooth extraction.

1 Jung, R.E. et al. (2013). J Clin Periodontol. 40(1):90–8.
2 Araujo, M.G. et al. (2008). Int. J. Periodontics Restorative Dent. 28:123–135.
3 Araujo, M.G. et al. (2009). Clin Oral Implants Res. 20:433–440.
4 Nevins, ML. et al. (2003). Int J Periodontics Restorative Dent. 23(1):9-17.

Geistlich Bio-Oss Pen®

Geistlich Bio-Oss Pen®

› Original Geistlich Bio-Oss® granules
› Easy-to-use applicator for faster application, precision and convenience
› Greater flexibility in a variety of clinical situations
› Available in both large and small particles

Clinical Benefits

› Pre-filled delivery with ready-to-use granules saves procedure time
› Easy to hydrate with saline solution or patient blood
› Optimal access that allows easy placement into posterior defects
› Less waste and reduced spillage maximizes product use

Treatment inthe Maxilla with Geistlich Bio-Oss Pen®

Geistlich Bio-Oss Pen® is specifically designed delivery system with curved applicator tip, allows easy placement to the site.

Dr. Paul Rosen | Yardley, PA, USA

7.7%

Ridge dimension changes vs. 33.5% in non-grafted sites[1]

Objective: Replacement of two endodontically failed central incisors with immediate implants. Achieve successful osseointegration and improved anterior esthetics for the central incisors.

Conclusion: Tooth extraction with immediate implant placement combined with Geistlich Bio-Oss Pen® and Geistlich Bio-Gide® resulted in an esthetic outcome for tooth numbers 8 and 9.

1 Preoperative view of the maxillary incisors.

2 Degranulated extraction sockets.

3 Immediate implants in place. Resonance frequency analysis (RFA) was 69-70 for tooth #8 and 70-75 for tooth #9.

4 Geistlich Bio-Oss® Pen is used to fill the defects and over-contour the ridge.

5 Geistlich Bio-Gide® placed to cover the graft but also relieved from implant/healing abutment.

6 ePTFD interrupted suture used to pull gingiva labially from the palate.

7 Good gingival healing and contouring around the healing abutments at 1 month post-surgery.

8 Final crowns with good gingival contouring after 6-months post-operative. The GBR procedure provided a bone foundation for good soft-tissue esthetics.

9 Stable peri-implant bone level 11 years post-operatively.

1 Cardaropoli, D. et al. (2014). Int J Periodontics Restorative Dent. 34(2):211-7.

13

Our Therapeutic Areas

Our bone substitutes are essential components in the treatment of a broad range of therapeutic areas and are available in a variety of options to meet your handling and delivery needs.

Recommended Bone Substitute Products By Therapeutic Area

Bone Substitutes	Extraction Socket Management	Minor Bone Augmentation	SoftTissue Regeneration	Major Bone Augmentation	Sinus Floor Elevation	Periodontal Regeneration	Peri-Implantitis
Geistlich Bio-Oss®	●	●		●	●		●
Geistlich Bio-Oss Collagen®	●	●		●	●	●	●
Geistlich Bio-Oss Pen®	●	●		●	●		●
Geistlich Combi-Kit Collagen	●	●					●
Geistlich Perio-System Combi-Pack						●	

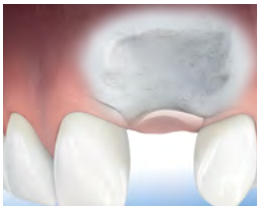
At Geistlich Biomaterials, we are committed to developing treatments that are uniquely matched to the hard and soft tissue clinical situations you see every day. That's why we do more than bring you a complete family of products – we provide proven solutions in specific therapeutic areas.

Extraction Socket Management

Minor Bone Augmentation

Soft Tissue Regeneration

Major Bone Augmentation



Sinus Floor Elevation

Periodontal Regeneration

Peri-Implantitis

Guided Bone Regeneration's Winning Combination

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.

Geistlich Bio-Oss® Product Range

Geistlich Bio-Oss®

Small granules (0.25 – 1 mm) | Quantities: 0.25 g, 0.5 g, 1.0 g, 2.0 g, 5.0 g (1 g ~ 2.05 cc)
Large granules (1 – 2 mm) | Quantities: 0.5 g, 1.0 g, 2.0 g (1 g ~ 3.13 cc)

De-proteinized bovine bone mineral.

Geistlich Bio-Oss Collagen®

Small granules (0.25 – 1 mm) | Quantities: 50 mg, 100 mg, 250 mg, 500 mg

De-proteinized bovine bone mineral, Geistlich Bio-Oss® small granules with 10% collagen added.

Geistlich Bio-Oss Pen®

Small granules (0.25 – 1 mm) | Quantities: 0.25 g, 0.5 g
Large granules (1 – 2 mm) | Quantities: 0.5 g

Geistlich Bio-Oss® granules in a convenient delivery system.

Combination Products

Geistlich Combi-Kit Collagen

Geistlich Bio-Gide® 16 x 22 mm, Geistlich Bio-Oss Collagen® 100 mg

When used together, Geistlich Bio-Gide® and Geistlich Bio-Oss Collagen® provide optimal properties for ridge preservation and minor bone augmentation procedures.

Geistlich Perio-System Combi-Pack

Geistlich Bio-Gide® Perio 16 x 22 mm, Geistlich Bio-Oss Collagen® 100 mg

When used together, Geistlich Bio-Gide® Perio and Geistlich Bio-Oss Collagen® provide optimal properties for regenerative periodontal procedures.

Geistlich
Biomaterials

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info@geistlich-na.com
dental.geistlich-na.com

EXACTLY
like no other.

Documented

More than 1,000 publications

Reliable

More than 30 years of clinical experience

Experienced

More than 165 years of Geistlich collagen competence

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

Indications:
Geistlich Bio-Oss®, Geistlich Bio-Oss Collagen® and Geistlich Bio-Oss Pen® are indicated for the following uses: Augmentation or reconstructive treatment of the alveolar ridge; Filling of periodontal defects; Filling of defects 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. As Geistlich Bio-Oss Collagen® contains collagen, in very rare circumstances cases of allergic reactions may occur.

Indications:
Geistlich Bio-Gide®, Geistlich Bio-Gide® Compressed, Geistlich Bio-Gide® Shape and Geistlich Bio-Gide® Perio are 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.

Indications:
Geistlich Mucograft® Seal is indicated for the following uses: Covering of implants placed in immediate or delayed extraction sockets, localized gingival augmentation to increase keratinized tissue (KT) around teeth and implants, alveolar ridge reconstruction for prosthetic treatment, recession defects for root coverage.

Warnings:
Geistlich Mucograft® Seal is a collagen products, 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, redness and local inflammation.

For more information on contraindications, precautions, and directions for use, please refer to the Geistlich Biomaterials Instructions for Use at: **dental.geistlich-na.com/ifu**