

LEADING REGENERATION

**Geistlich**  
Biomaterials

# *The alternative to connective tissue grafts*

Geistlich Fibro-Gide®







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# From Then to Now

Ever since an alternative to connective tissue grafts has been conceptualized at Geistlich Pharma AG, more than 1,000 prototypes have been tested, in what became the final development of Geistlich Fibro-Gide®. Geistlich Pharma AG has drawn from its vast experience in researching, analyzing and commercializing collagen based products tailor-made for specific dental procedures and therapeutic solutions. This collagen expertise has led Geistlich Pharma AG to its latest innovation, Geistlich Fibro-Gide®, to meet your clinical demand for a volume-stable collagen matrix.



## Screening by cell proliferation

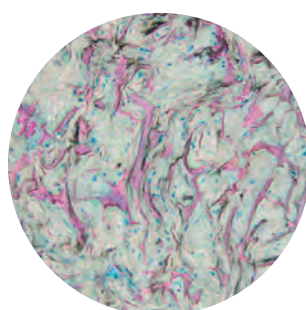
Geistlich Pharma AG developed a bioreactor to mimic the mechanical stresses of human mastication and in-vivo application.

After the first round of testing, the best Geistlich Fibro-Gide® prototypes were cultured with human gingival fibroblasts under mechanical stress. For the second round of selection the best prototypes in terms of cell proliferation and volume stability were chosen.<sup>1</sup>



## Mechanical testing

The mechanical properties of the best prototype selection remained stable, and the volume was retained (70–80%) even after mechanical forces were applied in repeated cycles.<sup>1</sup>



## Selecting for soft-tissue integration

Soft-tissue integration, degradation and vascularization in the remaining prototypes with different degrees of cross-linkage were tested. The Geistlich cross-linking process balances mechanical volume stability with cell compatibility and tissue integration.<sup>2</sup>



## The Alternative to Connective Tissue Grafts: Geistlich Fibro-Gide®

Finally, Geistlich Fibro-Gide® was designed to meet your clinical demand for a volume-stable collagen matrix that supports and promotes soft-tissue regeneration in the field of oral regeneration.

# Geistlich Fibro-Gide®

## Inspired by Nature Engineered by Geistlich

Geistlich Fibro-Gide® is a porcine, porous, resorbable and volume-stable collagen matrix, specifically designed for soft-tissue regeneration.

Geistlich Fibro-Gide® has been designed as an alternative treatment option to connective tissue grafts that are considered the gold standard in regenerative soft-tissue procedures.<sup>3,4,5</sup> This collagen matrix is intended to be used for soft-tissue regeneration at the alveolar ridge around natural teeth and implants, and should be used as a submerged scaffold where an increase in soft-tissue thickness is clinically desired.

## In a Nutshell

### Made of Collagen

Geistlich Fibro-Gide® is a porcine, porous, resorbable and volume-stable collagen matrix.<sup>7</sup>



### Volume Stability

The reconstituted collagen undergoes smart cross-linking for volume stability of the device.<sup>7</sup>

### Soft-Tissue Integration

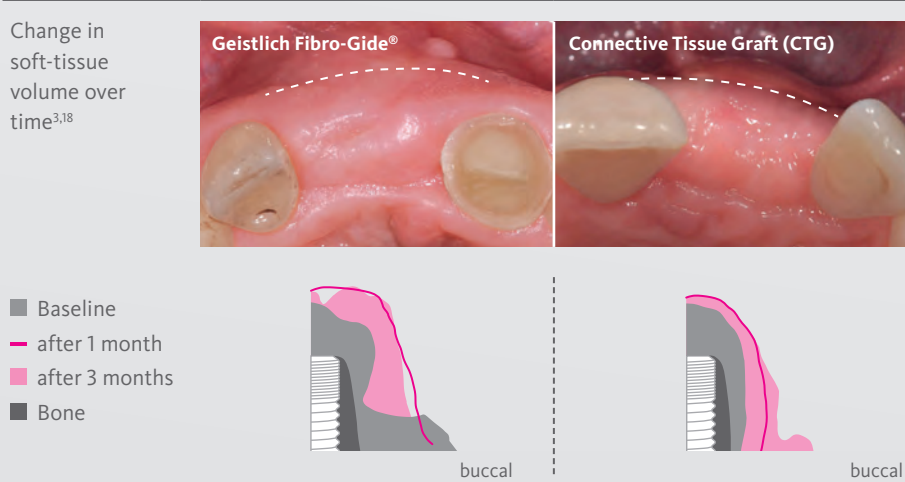
In vivo animal studies have shown a nearly complete degradation (~97%) after approx. 26 weeks.<sup>10</sup>

### Supports Soft-Tissue Formation

The porous network of Geistlich Fibro-Gide® supports angiogenesis, formation of new connective tissue and stability of the collagen network in submerged healing situations.<sup>3,6</sup>

# Compared to Connective Tissue Graft

| FEATURES             | GEISTLICH FIBRO-GIDE®   | CONNECTIVE TISSUE GRAFT (CTG)  |
|----------------------|---|--|
| Size                 | Two sizes:<br>15 × 20 × 6 mm and<br>20 × 40 × 6 mm.<br>Size can be adjusted according<br>to the patient's tissue defect.                                    | Size of the donor tissue varies with<br>the different anatomical<br>dimensions of the palatal vault. <sup>8</sup>  |
| Thickness            | No variation in thickness<br>thanks to pre-defined volume.  | Thickness is limited by anatomical<br>factors such as a thick alveolar<br>process, exostosis, and the palatine<br>nerves and blood vessels. <sup>9</sup> |
| Handling             | Ready-to-use, adheres easily<br>to the tissue.  | Slippery, needs precise<br>manipulation and degreasing.  |
| Healing              | Recommended in submerged<br>healing only.   | Can heal open and submerged.   |
| Availability         | Unlimited.  | Limited.   |
| Complications        | No risk of necrosis. <sup>10</sup>  | Risk of necrosis. <sup>10</sup>  |
| Patient<br>Morbidity | The absence of a donor site<br>significantly reduces post-<br>operative pain and minimizes<br>potential post-operative<br>complications. <sup>3,11–13</sup> | Patients often complain about<br>pain and numbness, especially<br>at the donor site, up to several<br>weeks post-surgery. <sup>14–17</sup>               |



► Geistlich Fibro-Gide® shows non-inferior results to connective tissue grafts in terms of change in soft-tissue volume over time.<sup>3,18</sup> Thus, Geistlich Fibro-Gide® is *the* alternative to connective tissue grafts.

# Treatment Concepts

Insufficient soft-tissue volume can be seen in different clinical situations, such as cases where implants have been placed and/or under prosthetic reconstructions. On the following pages dental surgeons share their experiences with Geistlich Fibro-Gide®.

## Staged Approach After Implant Placement

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## Simultaneous Approach With GBR

- > PD Dr. med. Vivianne Chappuis, p. 14
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# Insufficient Soft-Tissue Thickness in a Single Tooth Gap in the Anterior Maxilla

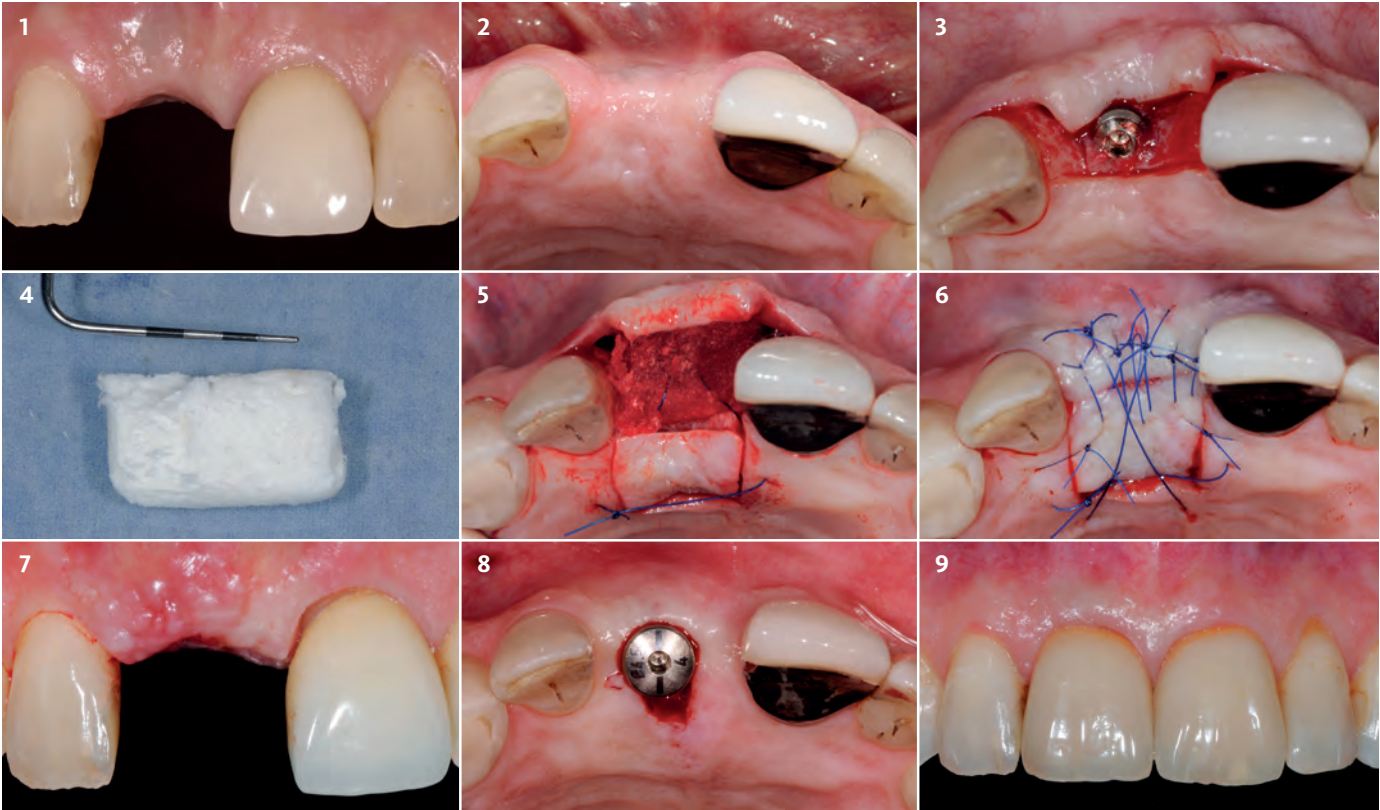


“Geistlich Fibro-Gide® is one of the major innovations in regenerative dentistry in the last 20 years.”

PD Dr. Daniel Thoma | Zurich, Switzerland

**Aim:** Gain in soft-tissue thickness in the esthetic area with Geistlich Fibro-Gide®.

**Conclusion:** After 6 months, the final restorations were placed. The natural look of the augmented soft-tissue can be appreciated, and no implant translucency is visible.



1 Baseline frontal view: missing central incisor. Implant visible through mucosa due to thin biotype.

2 Baseline occlusal view: soft-tissue deficit in the buccal and occlusal area.

3 Flap elevation on the buccal side using a full flap crestally and a split flap buccally.

4 Adaption of Geistlich Fibro-Gide® (15 × 20 × 6 mm) to the defect size.

5 Palatal island flap prepared to allow for tension-free wound closure. Geistlich Fibro-Gide® in situ, immobilized with a mattress suture.

6 Tension-free wound closure using single interrupted sutures (Dafilon 5-0, Braun).

7 Suture removal 7 days post-surgery.

8 Abutment connection.

9 6 months follow-up: final crown in place.

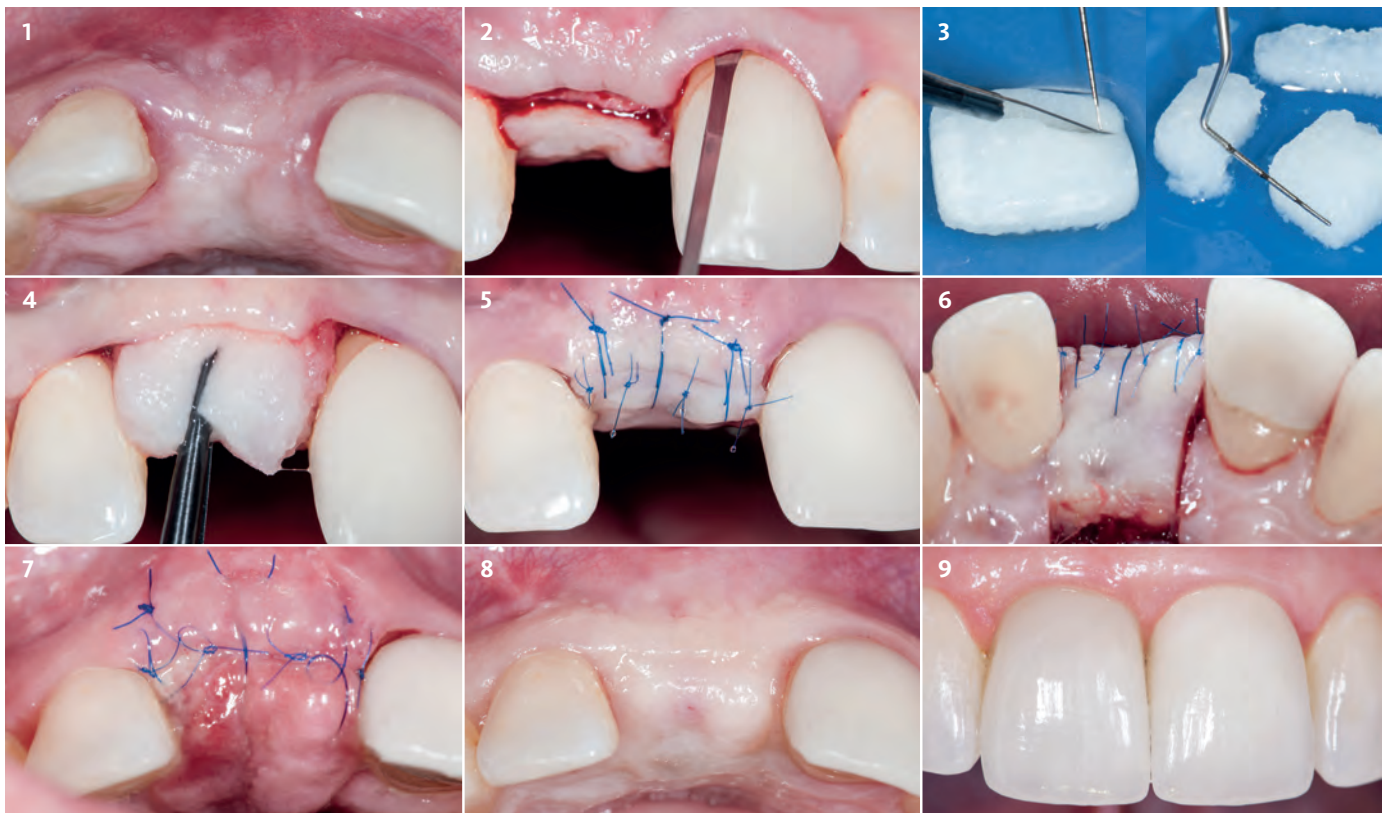
# Insufficient Soft-Tissue Thickness in a Single Tooth Gap in the Anterior Maxilla



Dr. Otto Zuhr | Munich, Germany

**Aim:** Gain in soft-tissue around a single implant in the esthetic area with Geistlich Fibro-Gide®.

**Conclusion:** The use of Geistlich Fibro-Gide® gave successfully esthetic results, providing the missing thickness of soft-tissue.



1 Occlusal view: missing left central incisor with labial soft-tissue deficiency 3 months after implant placement.

2 Labial flap preparation with a microsurgical tunneling knife.

3 Trimming Geistlich Fibro-Gide® in a wet state to fit the size of the defect.

4 Insertion of Geistlich Fibro-Gide® into the desired area.

5 Tension-free wound closure performed with double sling and single interrupted sutures.

6 Occlusal perspective after wound closure.

7 Situation before suture removal 7 days post-surgery.

8 Situation 4 months after soft-tissue augmentation.

9 6 months follow-up with the final implant restoration in place.

# Thickening Soft-Tissue When Uncovering an Implant in the Anterior Maxilla

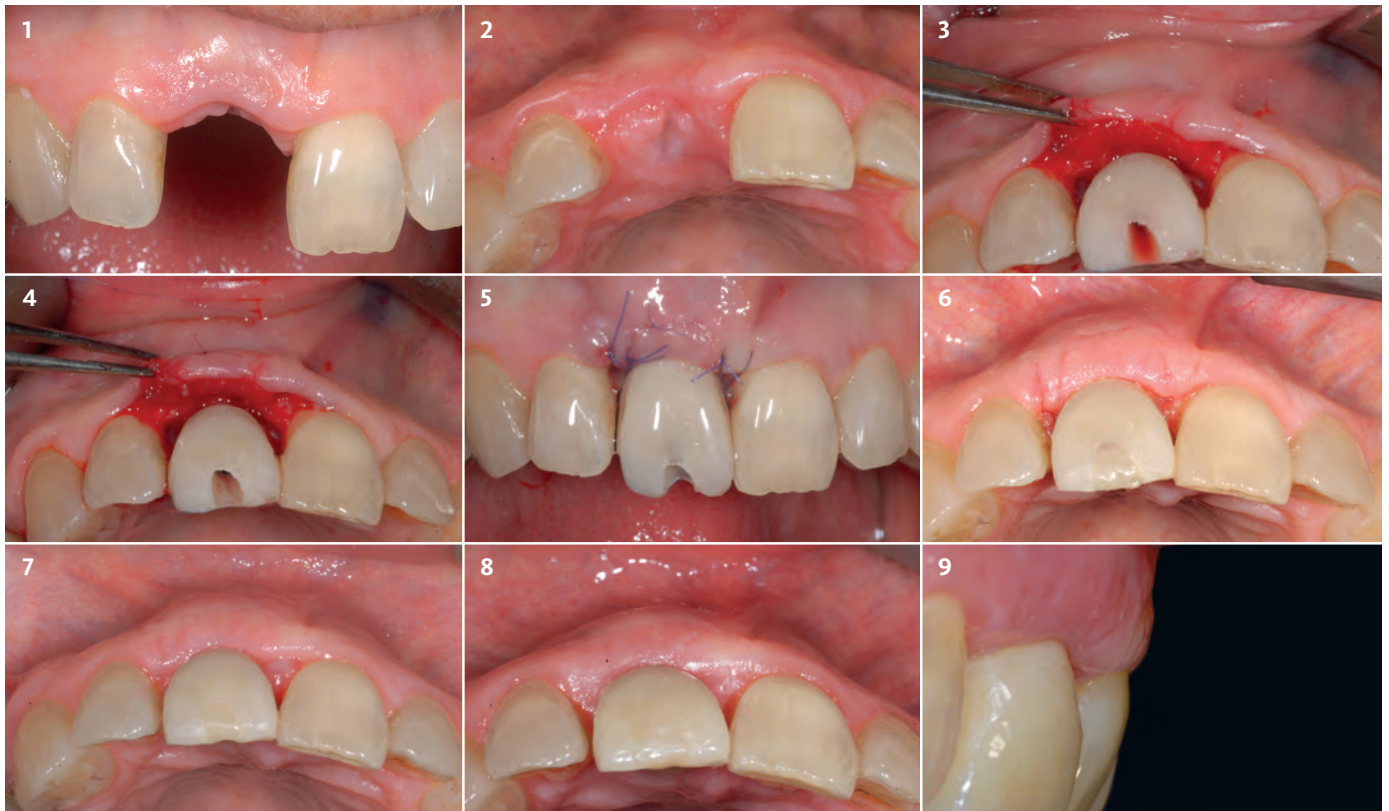


“Geistlich Fibro-Gide® can be used when the peri-implant soft-tissue has to be thickened.”

Prof. Leonardo Trombelli | Ferrara, Italy

**Aim:** Augmentation of soft-tissue at uncovering of a single implant in region 11 with Geistlich Fibro-Gide® using a minimally invasive flap design.

**Conclusion:** Geistlich Fibro-Gide® appears to be a valid alternative to connective tissue grafts (CTG) for significantly increasing the thickness of soft-tissue around dental implants.



1 Baseline buccal view: immediate implant placement was performed 3 months prior to replacing tooth 11.

2 Baseline occlusal view: soft-tissue deficiency on the buccal aspect.

3 Positioning of Geistlich Fibro-Gide® by using a minimal envelope flap. A provisional crown was inserted.

4 Stabilization of Geistlich Fibro-Gide® to the buccal mucosa using internal mattress sutures.

5 Tension-free wound closure (frontal view) to adapt the flap to the crown profile.

6 2 weeks follow-up and suture removal.

7 4 weeks follow-up: please note the uneventful wound healing and an increase in soft-tissue volume.

8 Occlusal view 5 months post-surgery: a substantial increase in soft-tissue thickness is evident.

9 Sagittal view of the buccal mucosa at 5 months.



# Insufficient Soft-Tissue Thickness Around Single Implant in the Posterior Maxilla

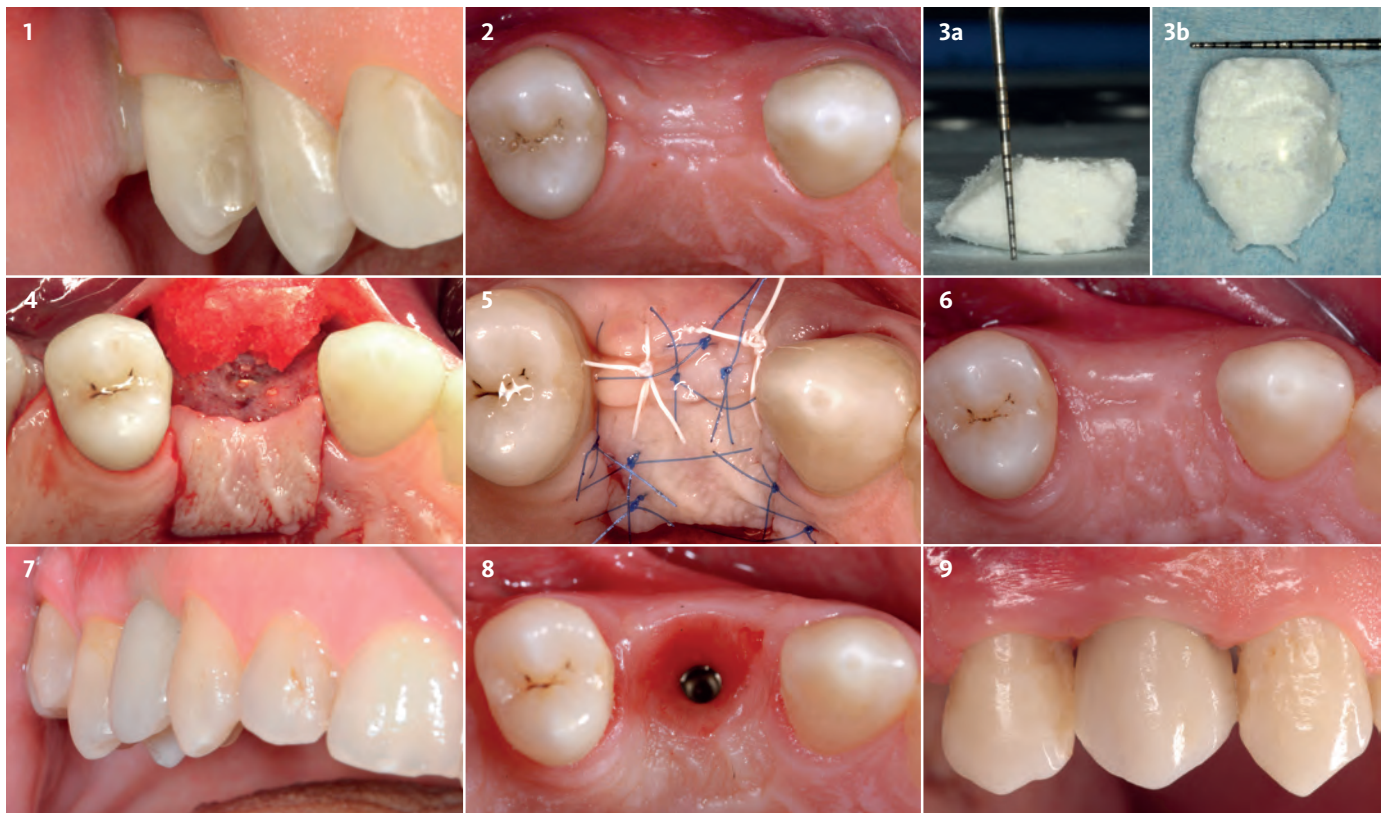


“Geistlich Fibro-Gide® can be used safely as an alternative to harvesting autologous connective tissue grafts.”

Prof. Mariano Sanz and Dr. Ignacio Sanz Martín | Madrid, Spain

**Aim:** Restore soft-tissue volume deficiency.

**Conclusion:** The collagen matrix helped to increase the buccal soft-tissue volume around the implant restoration.



1 Baseline buccal view: soft-tissue concavity at the dental implant site.

2 Baseline occlusal view: volume deficiency on the buccal aspect.

3 Adaption of Geistlich Fibro-Gide® to the defect size. Notice bevel cut performed in the area positioned close to the incision line.

4 Position of Geistlich Fibro-Gide® and fixation to the buccal flap with horizontal mattress suture.

5 Primary closure obtained by horizontal mattress and single interrupted sutures.

6 4 months follow-up: showing the healed soft-tissue after augmentation surgery.

7 4 months follow-up: provisional restoration. Notice volume recovery.

8 Occlusal view before final restoration.

9 9 months follow-up: final restoration after soft-tissue augmentation surgery.

# Better Quality of Life for Your Patients

Interview with PD Dr. Daniel Thoma  
(University of Zurich, Switzerland)

## What do you like about Geistlich Fibro-Gide®?

What I like most about Geistlich Fibro-Gide® is its unlimited availability and its standardized quality. In contrast to subepithelial connective tissue grafts, Geistlich Fibro-Gide® does not give a reason to worry about limitations in terms of quantity and quality. Moreover, avoiding a second surgical site reduces patient morbidity as well as my surgical time.

## Do you see any risks in the use of Geistlich Fibro-Gide®?

Every surgical intervention is associated with certain risks. Thus, in the case of Geistlich Fibro-Gide®, incomplete wound healing might occur with exposure of the material to the oral cavity. Based on our own experience, such complications do not result in any local infection, and the material does not have to be removed. As such, I would even expect less risk than with the use of a subepithelial connective tissue graft.

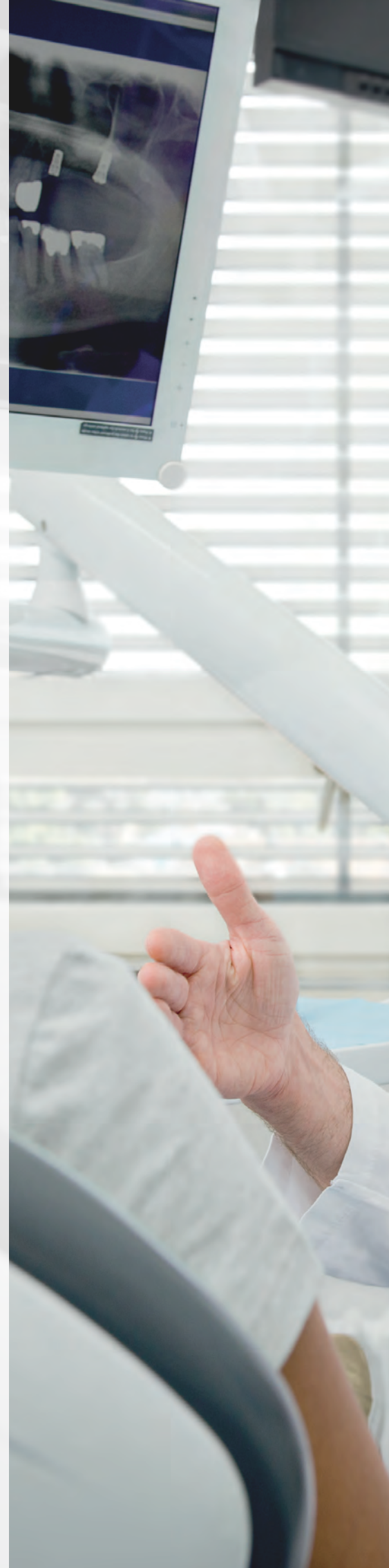
## When patients need a soft-tissue augmentation procedure, what do you tell them?

I usually offer my patients two options when a soft-tissue grafting procedure is indicated. Option one is the use of a subepithelial connective tissue graft. This procedure is well-documented in the literature with long-term outcomes and considered the gold standard.

As an alternative, the use of Geistlich Fibro-Gide® is suggested, which offers benefits in terms of reduced patient morbidity, surgical time and unlimited availability. My patients are informed that the use of Geistlich Fibro-Gide® is less documented, but in pre-clinical and clinical research performed over a ten year period, the outcomes were non-inferior to the gold standard.<sup>3,18</sup>

## How do your patients benefit, and how do you benefit from using Geistlich Fibro-Gide®?

Advantages for me are the unlimited availability and standardized quality, as well as the ease of use and faster surgeries. My patients benefit from shorter treatments, less swelling and less morbidity since no second surgery is needed. Larger areas and more sites can be treated at the same time.





**“Avoiding a second surgical site reduces patient morbidity as well as my surgical time.”**

PD Dr. Daniel Thoma





# Insufficient Soft-Tissue Around Implants in a Fully Edentulous Maxilla

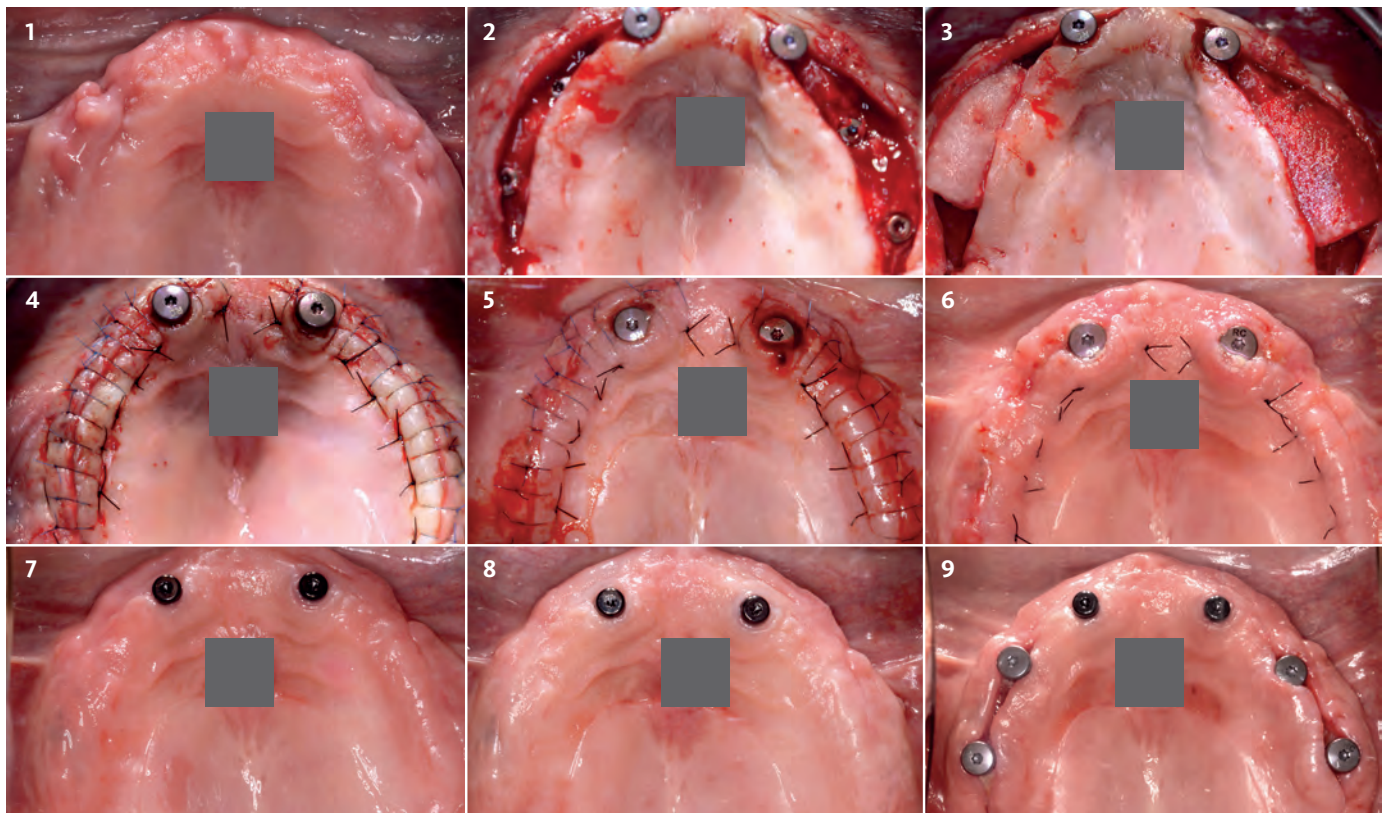


“Geistlich Fibro-Gide® offers promising new avenues in conservative soft-tissue augmentation of edentulous ridges and gingiva around implants and seems to be an alternative to autologous tissue grafts.”

PD Dr. med. dent. Michael Chr. Stimmelmayer | Cham, Germany

**Aim:** Increasing the thickness of soft-tissue around dental implants in an edentulous ridge with Geistlich Fibro-Gide®.

**Conclusion:** Geistlich Fibro-Gide® reduces morbidity, especially in larger cases where bigger grafts are needed.



■ Details covered by grey boxes due to copyright reasons.

- 1 Baseline: fully edentulous upper jaw.
- 2 Re-entry after placement of two anterior equicrestal implants and two-staged hard-tissue augmentation in both posterior regions.
- 3 Covering the inserted 4 equicrestal implants, by using two pieces of Geistlich Fibro-Gide® (3 mm thickness) . They were extended from the buccal aspect over the occlusal to the palatal aspect covering and thickening the alveolar ridge on both sides.
- 4 Tension-free wound closure using mattress sutures (Nylon 5-0, Resorba) for flap fixation and single sutures (Moplyen 6-0, Resorba) for wound adaptation. Two implants in the front have been covered with transmucosal healing abutments.
- 5 Healing situation 2 days post-surgery.
- 6 1 week post-surgery: uneventful soft-tissue healing and suture removal.
- 7 Soft-tissue situation 6 weeks post-surgery. Mattress sutures were removed 2 weeks post-surgery.
- 8 5 months follow-up before re-entry.
- 9 A second surgical procedure is required for uncovering the implants: wound healing with stable soft-tissue situation 10 days after uncovering.

# Insufficient Soft-Tissue Thickness Around Single Implant in the Anterior Mandible

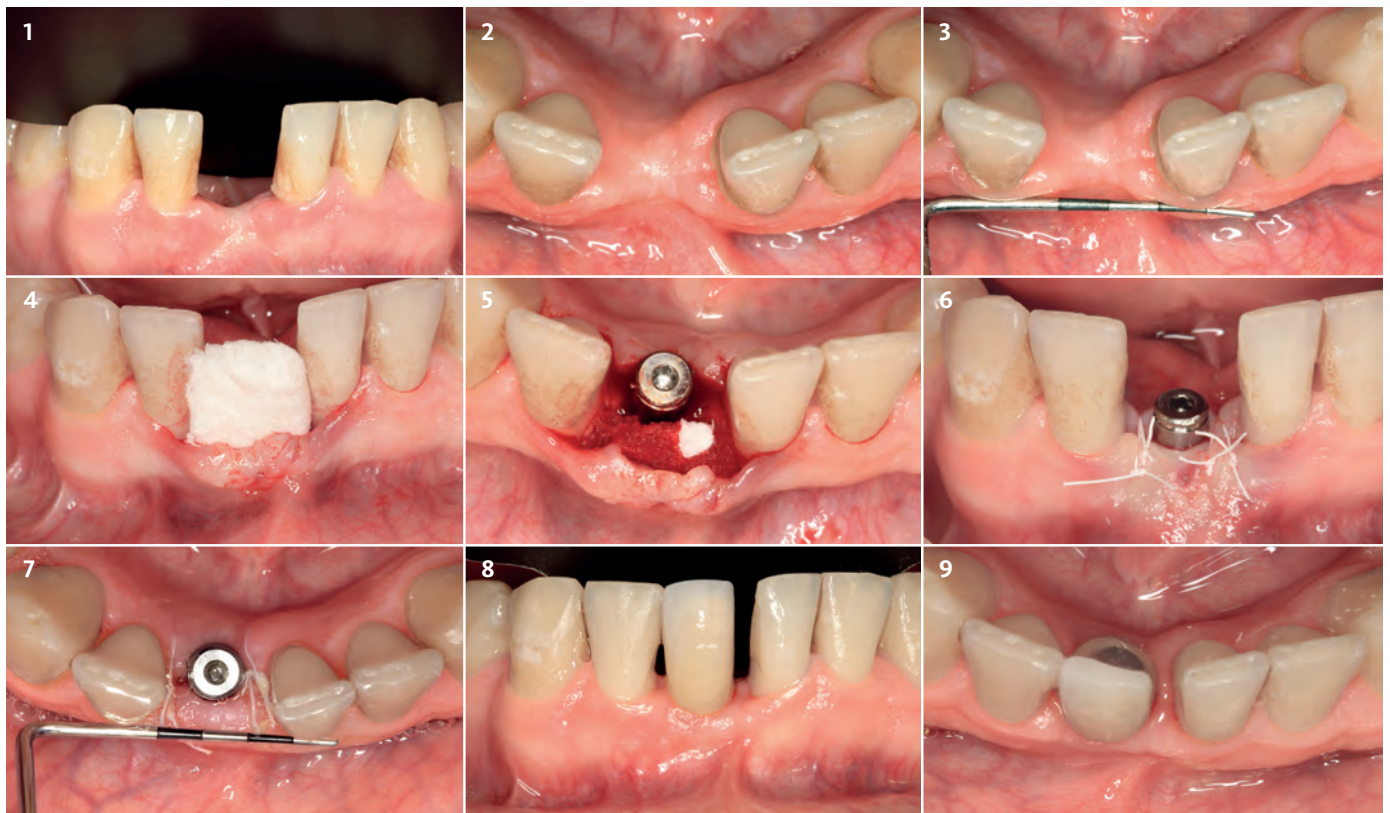


“Geistlich Fibro-Gide® is a good option for patients with soft-tissue deficiencies in the esthetic zone where an easy and pain-free treatment solution is necessary to achieve soft-tissue thickening on the facial aspect of the alveolar ridge.”

Dr. Rafael Naranjo | Málaga, Spain

**Aim:** Increasing the thickness of soft-tissue in single implant sites with Geistlich Fibro-Gide®.

**Conclusion:** Geistlich Fibro-Gide® can be used to safely enhance protocols for implant placement and soft-tissue management.



1 Healed site 2 months after implant placement and GBR to replace missing lower central incisor 41.

2 Occlusal view: 2 months after implant placement and GBR to replace missing lower central incisor 41. Please note the narrow ridge and buccal soft-tissue deficiency.

3 Occlusal view, healed site: measuring the defect before second stage surgery for soft-tissue augmentation.

4 Insertion of Geistlich Fibro-Gide®: full thickness envelope flap without vertical releasing incisions. Generously released flap beyond the mucogingival line in the apical direction to ensure a tension-free wound closure.

5 Implant is covered with a transmucosal healing abutment. Geistlich Fibro-Gide® (trimmed to 9 × 6 × 4 mm) in situ on the buccal aspect.

6 Transmucosal healing of the implant and tension-free wound closure with two non-resorbable single sutures.

7 2 weeks post-surgery (occlusal view). Measuring the gain in soft-tissue thickness on the lateral aspect.

8 6 weeks post-surgery (frontal view) with temporary, screw-retained crown in situ.

9 6 weeks post-surgery (occlusal view) with temporary, screw-retained crown in situ.



# Insufficient Soft-Tissue Thickness in Extended Gap in the Posterior Mandible

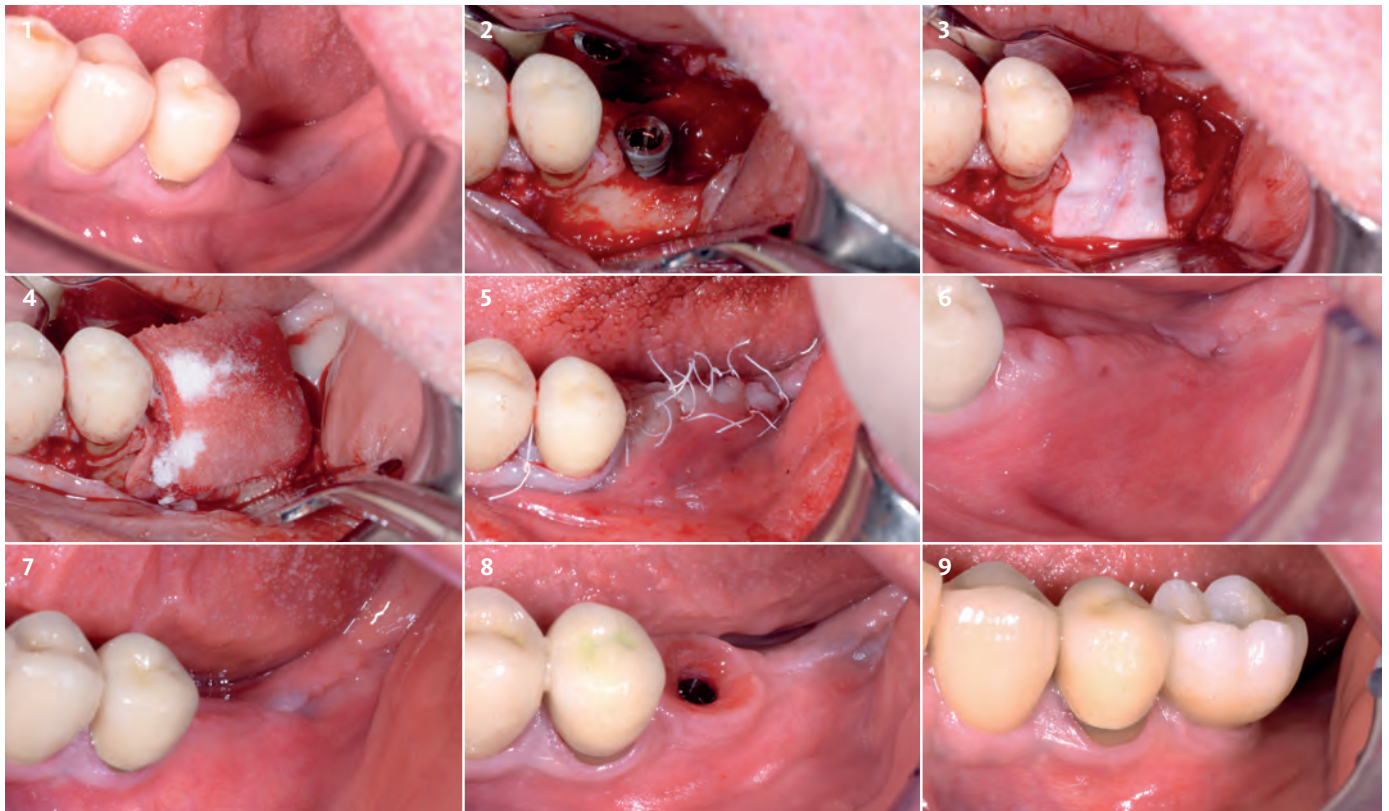


“Geistlich Fibro-Gide® is one of the best innovations for gaining soft-tissue thickness.”

Dr. Daniele Cardaropoli | Torino, Italy

**Aim:** Increasing the thickness of soft-tissue around dental implants with Geistlich Fibro-Gide® in the posterior area of the mandible to support protection and to restore function.

**Conclusion:** Geistlich Fibro-Gide® can be used as an alternative to connective tissue grafts (CTG) to significantly increase the soft-tissue thickness around dental implants.



1 Baseline before implant placement showing the soft-tissue deficiency.

2 Implant surgery after implant placement showing the need for GBR.

3 Guided Bone Regeneration (GBR) with Geistlich Bio-Oss® and Geistlich Bio-Gide®.

4 Geistlich Fibro-Gide® was trimmed to the defect size and placed at full thickness (6 mm) on top of Geistlich Bio-Gide®.

5 Wound closure (PTFE 5/0 sutures) by combining horizontal mattress sutures and single sutures in a double layer.

6 2 weeks follow-up post-surgery.

7 3 months follow-up post-surgery.

8 Re-entry was performed 3 months post-surgery. Soft-tissue emergence profile at the time of final ceramic-crown delivery 4 months after implant placement.

9 4 months after implant placement: final ceramic crown.



# Ridge Preservation and Simultaneous Soft-Tissue Augmentation in the Posterior Mandible

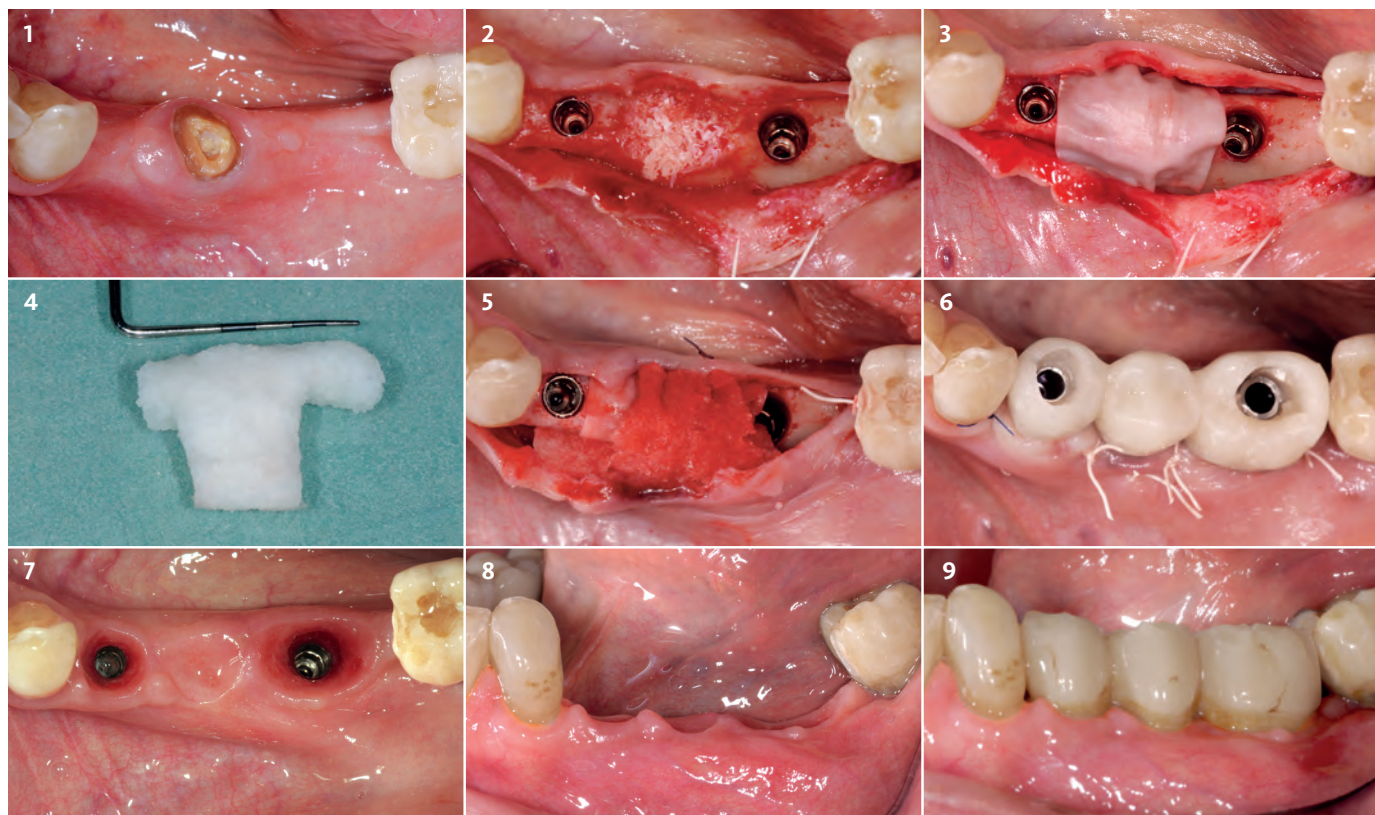


“Geistlich Fibro-Gide® is a ready-to-use product that can easily be used on top of a GBR procedure for soft-tissue thickening.”

PD Dr. Daniel Thoma | Zurich, Switzerland

**Aim:** Augmentation of soft-tissue around dental implants with Geistlich Fibro-Gide® while performing a ridge preservation procedure using Geistlich Bio-Oss® and Geistlich Bio-Gide®.

**Conclusion:** Geistlich Fibro-Gide® shows predictable results in soft-tissue augmentation under pontics compared to connective tissue grafts (CTG).



1 Baseline occlusal view: situation before removal of tooth 35.

2 Tooth removal and extraction socket management.

3 Ridge preservation with Geistlich Bio-Oss® and Geistlich Bio-Gide®.

4 Geistlich Fibro-Gide® was trimmed to the defect size, to augment the buccal and crestal soft-tissue area of the ridge.

5 Geistlich Fibro-Gide® in place augmenting buccal and crestal area of 35 and buccal in the edentulous area 34 to 36.

6 Immediate provisionalization of the implants.

7 3 weeks post-surgery: occlusal view of augmented area with created emergence profile.

8 3 weeks post-surgery: buccal view of augmented area with created emergence profile.

9 Final restoration 6 weeks post-surgery.

# Guided Bone Regeneration With Simultaneous Soft-Tissue Augmentation in the Anterior Maxilla

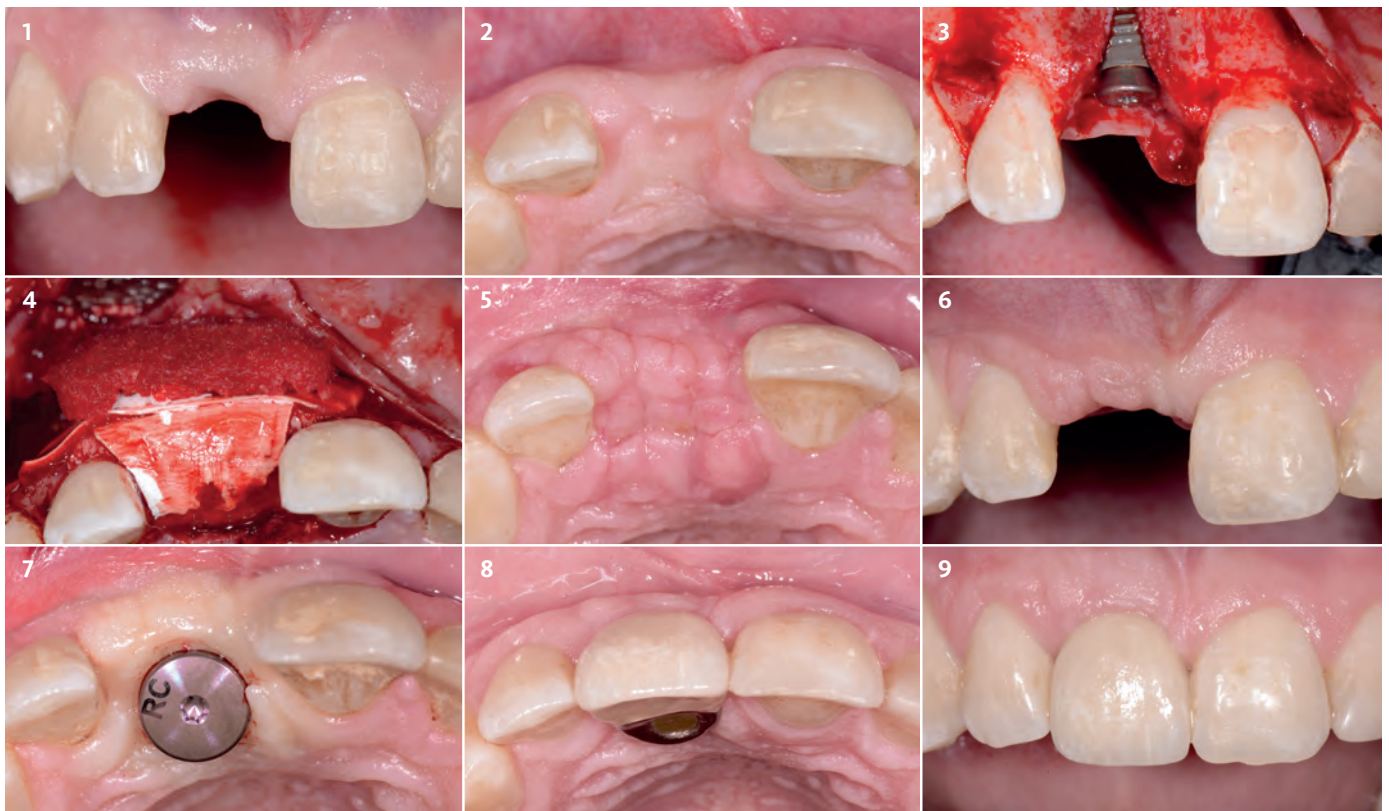


“Geistlich Fibro-Gide® shows an uneventful tissue integration with simultaneous GBR procedures in a preliminary human study after two months of healing.”

PD Dr. med. Vivianne Chappuis | Bern, Switzerland

**Aim:** Guided Bone Regeneration (GBR) procedure with autologous bone chips, Geistlich Bio-Oss® and Geistlich Bio-Gide® simultaneously with soft-tissue augmentation using Geistlich Fibro-Gide®.

**Conclusion:** Guided Bone Regeneration (GBR) can be performed simultaneously with soft-tissue augmentation with Geistlich Fibro-Gide®.



1 Baseline frontal view: missing central incisor.

2 Baseline occlusal view: The facial contour is flattened by physiological dimensional ridge alterations post-extraction.

3 Full-thickness flap using one releasing incision in the distal aspect of the canine. Simultaneous contour augmentation using GBR was performed with autogenous bone chips to cover the exposed implant combined with a layer of Geistlich Bio-Oss® and Geistlich Bio-Gide®.

4 Application of Geistlich Fibro-Gide® on top of the augmented area. A tension-free primary wound closure was obtained by a periosteal releasing incision.

5 Suture removal after 14 days. Please note the uneventful wound healing and an increase in soft-tissue volume.

6 Frontal view 4 weeks post-surgery.

7 2 months follow-up combined with abutment connection.

8 Occlusal view of final restoration 2 years post-surgery.

9 Final restoration 2 years post-surgery shows pleasing esthetics.



# Guided Bone Regeneration With Simultaneous Soft-Tissue Thickness Augmentation in the Anterior Maxilla

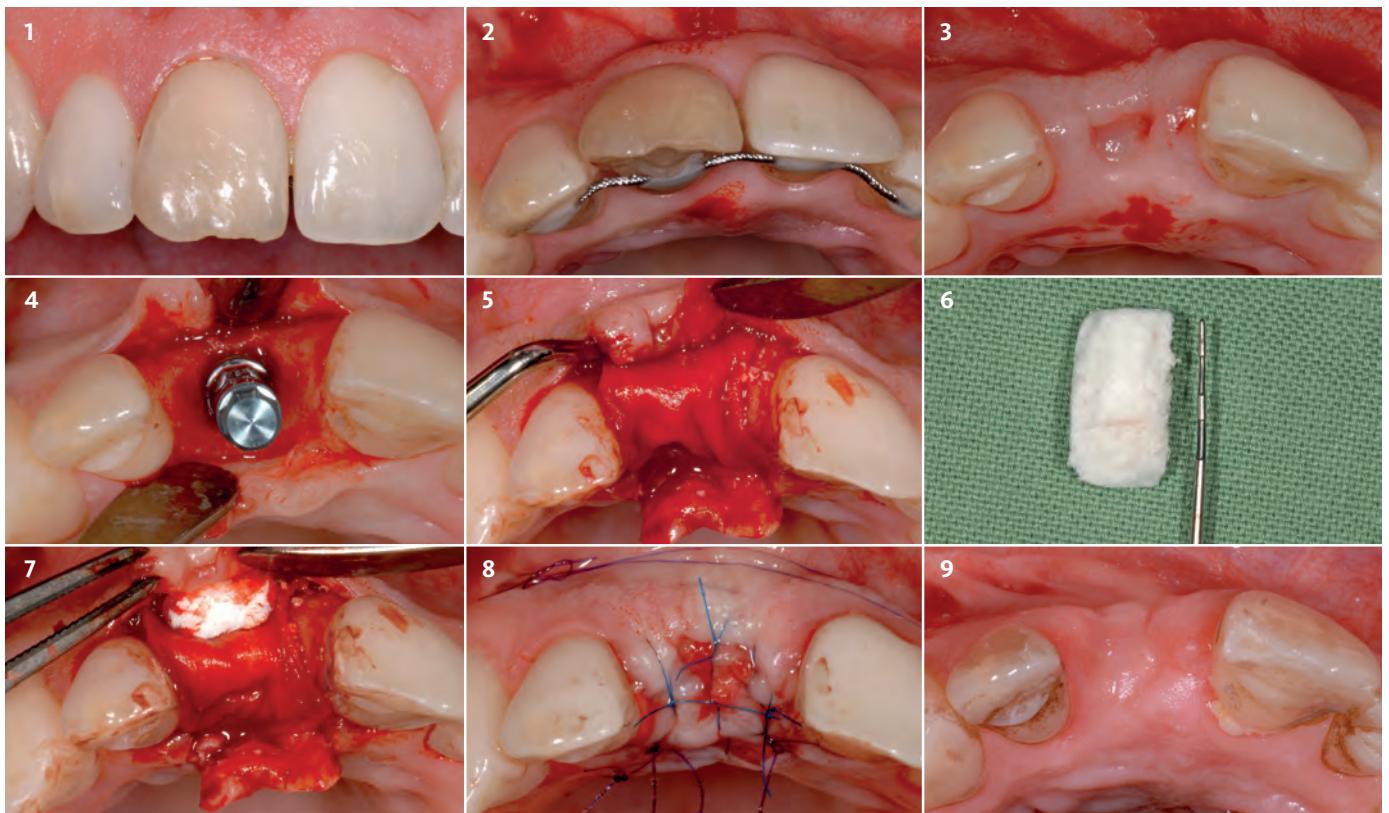


“Geistlich Fibro-Gide® can easily be used for thickening the soft-tissue while performing early implant placement.”

Dr. Beat Wallkamm | Langenthal, Switzerland

**Aim:** Increasing the thickness of soft-tissue around dental implants with Geistlich Fibro-Gide® while performing early implant placement.

**Conclusion:** Geistlich Fibro-Gide® can be used as an alternative to connective tissue grafts (CTG) to significantly increase the thickness of the soft-tissue around dental implants while simultaneously placing the implants.



1 Baseline frontal view.

2 Baseline occlusal view: soft-tissue deficiency in the buccal and occlusal area.

3 After tooth removal, the extraction socket was left open for spontaneous healing.

4 Implant placement after 9 weeks.

5 Guided bone regeneration procedure with Geistlich Bio-Oss® and Geistlich Bio-Gide®.

6 Geistlich Fibro-Gide® was trimmed to fit the defect size.

7 Geistlich Fibro-Gide® is positioned directly over Geistlich Bio-Gide® in the buccal area.

8 Tension free wound closure. No fixation of Geistlich Fibro-Gide® due to its stability in situ.

9 Healing 10 weeks after surgery.



# Geistlich Fibro-Gide®

## Handling at a Glance

**Flap Design** Use your preferred flap design. A generous release of the flap is the key to promoting successful healing by complete coverage of Geistlich Fibro-Gide® (submerged healing).

**Trim To Fit** Geistlich Fibro-Gide® can be adjusted in size and thickness in order to best achieve the desired augmentation.

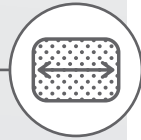
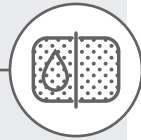
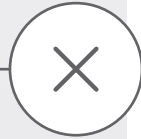
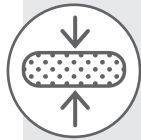
**Precise Trimming** Using a scalpel will help in achieving smooth edges and bevels for improved wound adaptation and precise fit of the matrix.

**Thickness** Close to wound margins, reduction of the thickness of the Geistlich Fibro-Gide® to 2–3 mm may be recommendable in order to avoid dehiscence during the healing phase.

**Adhesion** Geistlich Fibro-Gide® becomes adhesive when soaked with blood and keeps a stable position once inserted. Suturing the device to the underlying soft-tissue is usually not necessary.

**Wound Closure** A tension-free closure of the flap is key for a successful and complication-free healing and avoidance of any dehiscences during the healing phase.

**Learning Curve** As with any new product, you will experience a learning curve until getting used to the handling properties and performance of the device.



**Minimally Invasive Application** Tunneling and/or pouch techniques are still clinically being investigated. However, current data shows successful insertion of Geistlich Fibro-Gide® using these techniques.

**Trim Wet Or Dry** Geistlich Fibro-Gide® can be cut and trimmed both in a dry or wet state using either scissors and/or a scalpel. The scalpel is recommended for dry handling.

**Volume Changes** Swelling of the device upon wetting must be taken into account when determining final dimensions. The device will gain approximately 25% in volume upon wetting. A generous flap design is the key to full coverage of the matrix.

**Application** Geistlich Fibro-Gide® can be applied either in a dry or wet state upon individual preference. Pre-wetting can be done with patient's own blood or sterile saline solution.

**In Situ Adaptation** Prior to wound closure, the size of the device should be finally assessed in light of a tension-free wound closure and complete coverage of the device.

**Healing** Clinical experience shows low incidence of wound healing complications.<sup>3,18</sup>

Contents are based on preclinical and clinical evidence gained during the Geistlich Fibro-Gide® pre-launch phase.

## About Geistlich Pharma AG

Geistlich Pharma AG produces innovative bio-derived products for bone and soft-tissue regeneration for use in dentistry and cranio and maxillofacial surgeries. From research and development to marketing, our operations are fully integrated under one roof, which enables us to oversee and optimize all levels of our business.

Backed by more than 160 years of experience in bone and collagen processing, we have developed techniques to either gently preserve collagen structures in raw materials or to remove them entirely without damaging other components. In the 1990's, Geistlich Pharma AG was among the first pharmaceutical companies to apply collagen for medical use. As experts in bone and soft-tissue regeneration, we see tremendous potential for collagen in the future of regenerative dentistry.

That is why we have dedicated a team of biochemists, material scientists, process engineers, and other experts at our headquarters in Switzerland to focus exclusively on collagen, and to explore its possible therapeutic applications. Our pioneering regenerative dentistry products include the Geistlich Bio-Oss®, Geistlich Bio-Gide®, Geistlich Mucograft® and Geistlich Fibro-Gide® product families.

Through close ties with the dental and scientific community, we continue to share our knowledge and optimize our bone- and collagen-derived products. Finding ways to improve patient's quality of life remains our overarching goal.



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