

# Gingival recessions using a 3-D collagen matrix

**Author** Prof. Dr Gregor-Georg Zafiropoulos, Germany

Nowadays, increasing patient demand for covering of gingival recessions has resulted in growing interest in improved treatment options. In recent decades, recession coverage by the combination of a connective tissue graft (CTG) with various flap techniques (envelope technique, laterally repositioned flap, coronally repositioned flap, tunnel technique) has become the standard treatment of recessions, providing very good results with regard to aesthetics and function. Compared with a free gingival graft, the CTG offers the advantage of good

adaptation to the gingival colour, a minimal risk of keloid formation and the possibility of closing the palatal harvesting site, thereby minimising the risk of post-operative complications and bleeding. The shortage of donor tissue is a significant limitation of the CTG. Furthermore, it is a delicate technique that requires profound surgical experience, since it poses the risk of injury to the palatine artery. Even though the end-results are often satisfying, the second surgical intervention at the palatal harvesting site has low patient acceptance.

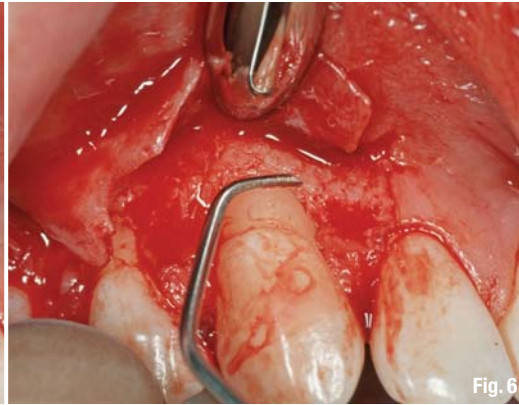
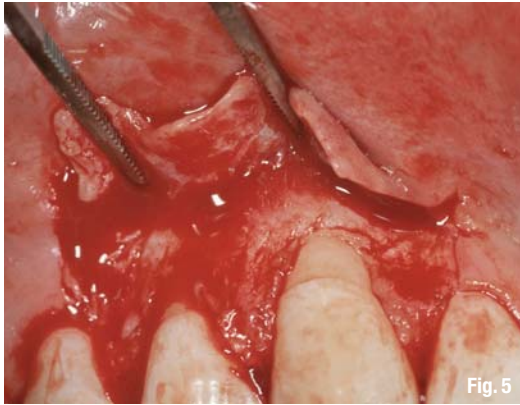
**Fig. 1**\_Regio 13, initial clinical situation.

**Fig. 2**\_Regio 13, horizontal incision.

**Fig. 3**\_Regio 13, de-epithelialisation and preparation of triangles.

**Fig. 4**\_Regio 13, vertical incisions.





**Fig. 5**\_Regio 13, mobilisation of the mucosal flap.

**Fig. 6**\_Regio 13, root surface planning.

Biomaterials have been frequently applied in periodontal and implant surgery for regeneration and/or augmentation of bone defects and extraction sockets for many years. Recently, new biomaterials, such as a 3-D collagen matrix, were introduced as an alternative to CTG application for soft-tissue augmentation. The structure of the matrix allows ingrowth of soft-tissue cells and blood vessels, and subsequent integration into the surrounding tissue. This report presents a representative case for the treatment of gingival recessions using a 3-D collagen matrix.

### Initial clinical situation and treatment summary

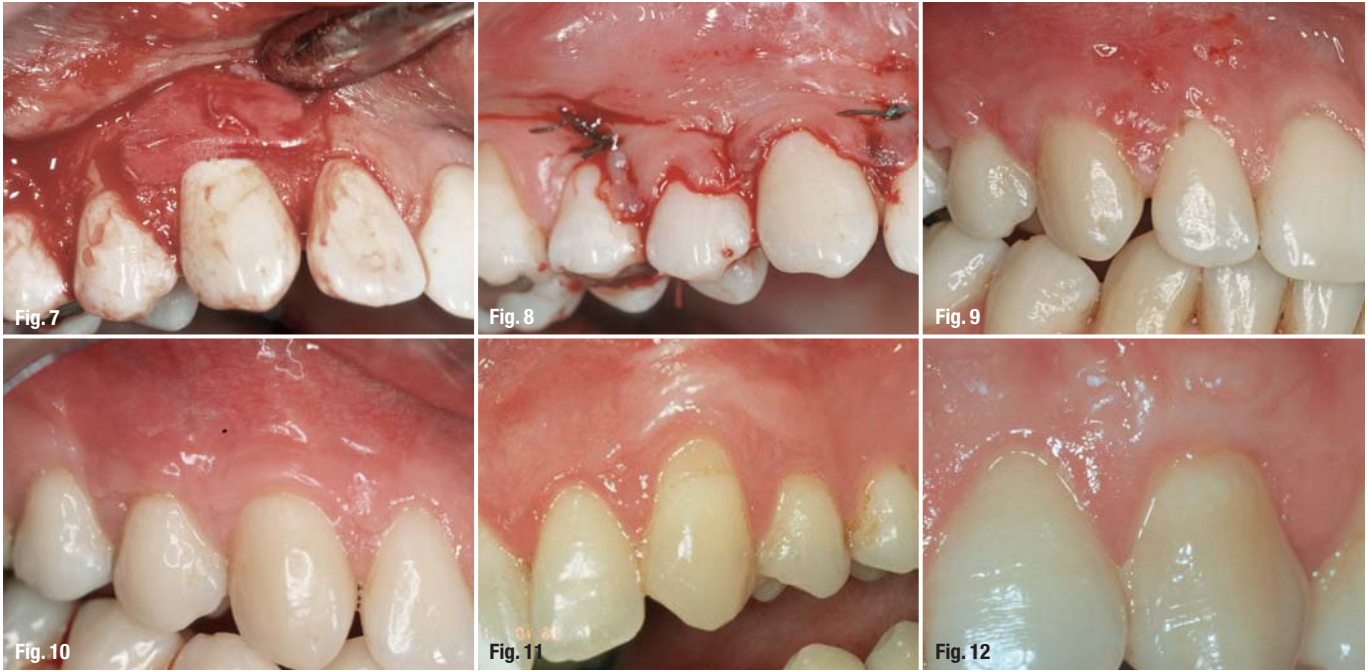
The patient (male, 51 years old, non-smoking) presented with gingival recession with cold sensitivity in regions 13 and 23. Once informed consent had been obtained, the clinical study was commenced. The recession in region 13 (Fig. 1) was treated with a 3-D collagen matrix (Type I/III collagen, originating from porcine dermis; mucoderm, botiss dental), while the recession in region 23 was treated with a CTG. The two surgical sites were

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**Fig. 7**\_Regio 13, 3-D collagen matrix in situ.  
**Fig. 8**\_Regio 13, coronal repositioning of the flap.  
**Fig. 9**\_Regio 13, clinical situation two weeks post-op.  
**Fig. 10**\_Regio 13, clinical situation six months post-op (3-D collagen matrix).  
**Fig. 11**\_Regio 23, initial clinical situation.  
**Fig. 12**\_Regio 23, clinical situation six months post-op (treated using CTG).

treated on the same day, and both transplants were combined with a coronally advanced flap.

### Surgical procedure

First, a horizontal incision at the height of the cemento–enamel junction in the region of the interdental papillae was performed (Fig. 2). The coronal side of the papillae was de-epithelialised; the resulting connective tissue triangles served for the later fixation of the mucosal flap (Fig. 3). The full width of the interdental papillae was maintained. Two vertical incisions were made and a mucosal flap was raised without compromising the connective tissue triangles in the area of the interdental papillae (Figs. 4 & 5). Subsequently, the roots of the affected teeth were cleaned and planed (Fig. 6). The 3-D collagen matrix was first rehydrated in sterile saline, then cut to shape and fixed to the periosteum with resorbable sutures (Fig. 7). Next, a periosteal incision at the apical end of the mucosal flap was performed to enable repositioning of the flap and tension-free fixation to the connective tissue triangles of the interdental papillae with non-resorbable sutures (Fig. 8). Plaque-inhibiting agents were prescribed for the first two weeks after surgery. The sutures were removed two weeks post-operatively (Fig. 9). Figure 10 demonstrates the clinical result six months post-operatively. The recession in region 23 was treated with a CTG and a coronally advanced flap. Figures 11 and 12 show the situation preoperatively and six months after recession coverage. There was no visible difference between the two differently treated regions.

### Conclusion

The CTG has successfully been applied in periodontal surgery for a long time. Because of better colour matching with the gingiva, the CTG shows better aesthetic results compared with free gingival grafts. The new 3-D collagen matrix offers a valid alternative to the application of a CTG. The surgical technique (coronally advanced flap, tunnel technique, etc.) does not require adaptation and can be selected according to the individual case. The advantage of using the 3-D collagen matrix is circumvention of a second surgical site for harvesting of the transplant, while achieving the desired aesthetic and functional results. In my practice, more than 50 gingival recessions have been treated with a combination of a 3-D collagen matrix with a coronally advanced flap over the last several years, and no complications have been observed. Furthermore, the results of an ongoing clinical study by our team indicate that there is no difference between the results of recession coverage after treatment with a CTG or with a 3-D collagen matrix.

### *contact*

**Prof. Dr Gregor-Georg Zafiropoulos**  
 Specialist for Periodontology  
 (DGP – German Soc. Periodontology)  
 Expert for Oral Implantology  
 (DGOI – German Soc. Oral Implantology)  
 Diplomate of ICOI  
 Sternstr. 61, 40479 Düsseldorf  
 zafiropoulos@prof-zafiropoulos.de

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