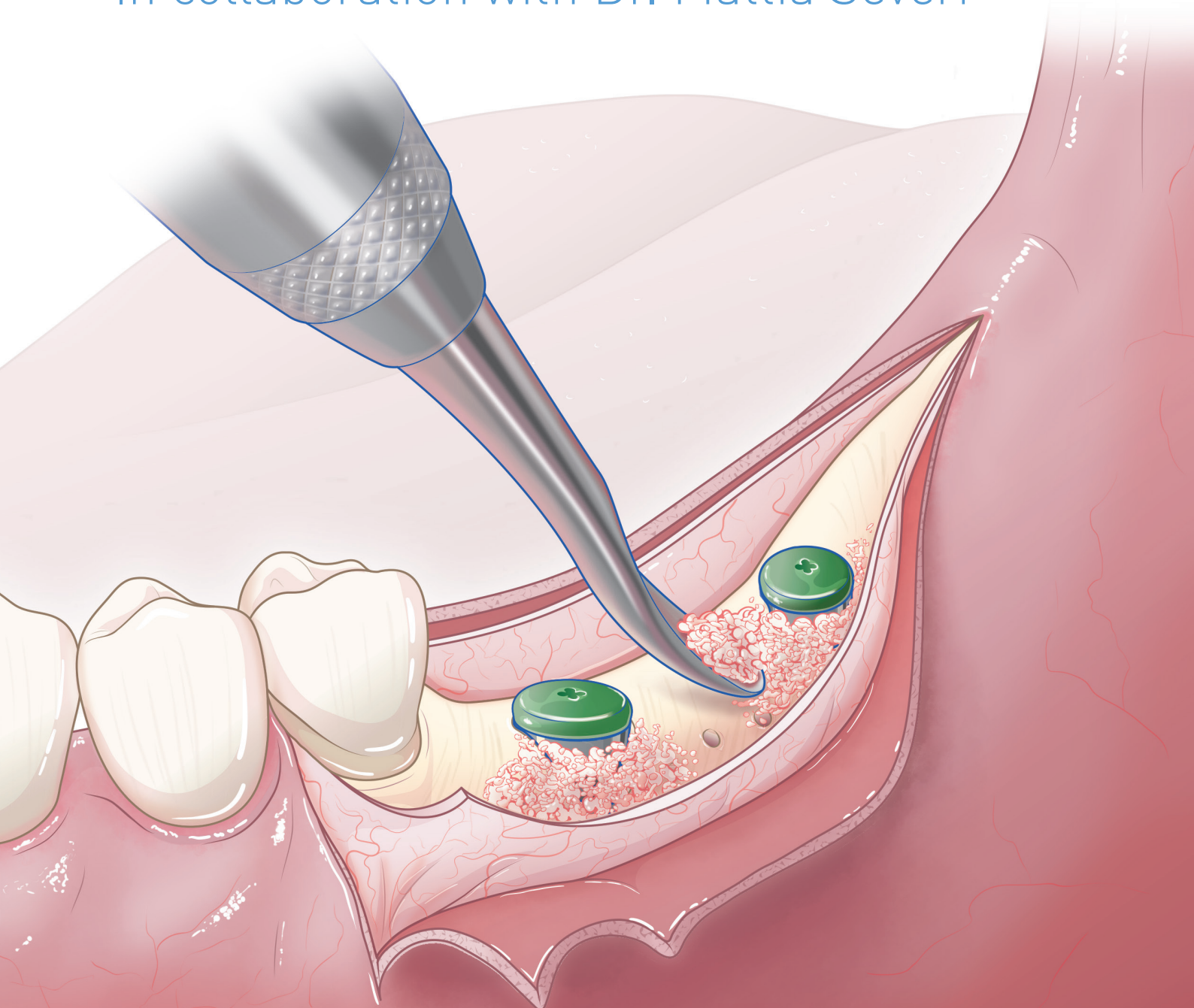


The SPAL Technique with Thommen Medical

Prof. Leonardo Trombelli

In collaboration with Dr. Mattia Severi



«The SPAL Technique is simple to perform, based on solid biological principles, and highly cost-effective.»
 Prof. Leonardo Trombelli



Prof. Leonardo Trombelli

Leonardo Trombelli, Full Professor and Director of the Research Center for the Study of Periodontal and Peri-implant Diseases at the University of Ferrara, has extensive clinical and scientific experience in the field of Periodontology and Oral Implantology.

With an intensive clinical research activity and extensive scientific production in the field of periodontal and implant surgical techniques, Prof. Trombelli has made a significant contribution to the development of innovative techniques for periodontal and pre- and peri-implant bone regeneration.

The SPAL Technique

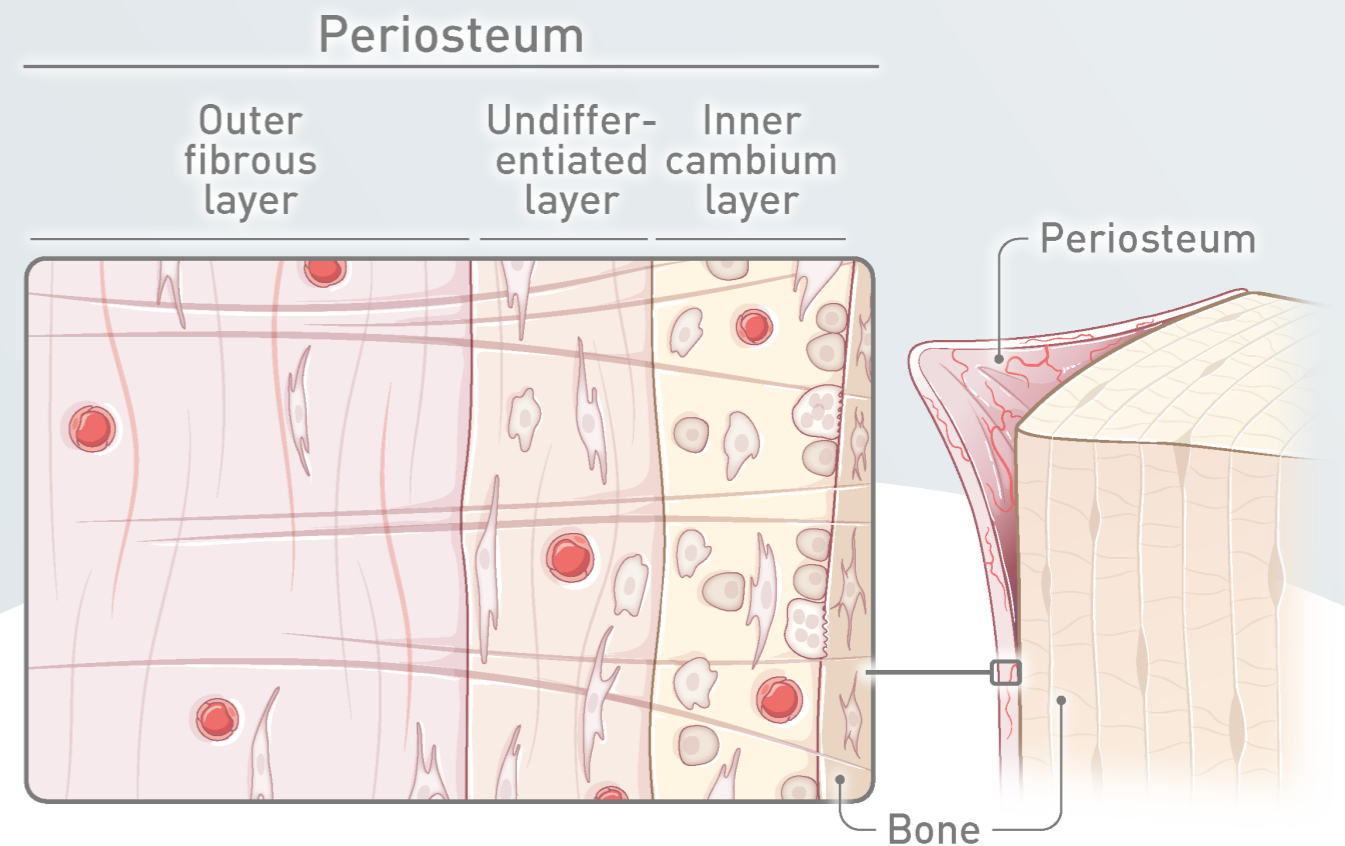
The SPAL Technique (Subperiosteal Peri-Implant Augmented Layer), developed by Prof. Leonardo Trombelli, was introduced as an innovative approach for increasing bone volume in cases of insufficient thickness and for correcting peri-implant bone dehiscences.

Why treat a peri-implant bone dehiscence? Implants with untreated dehiscences or with a thin cortical bone plate show progressive marginal bone resorption and a higher risk of peri-implant complications.

When to use the SPAL Technique? The SPAL Technique is indicated for the correction of peri-implant bone dehiscences during delayed implantation (Type 4), particularly in the posterior mandible or the upper premolar region. A modification of the technique also allows its application in immediate post-extraction implants.

How does the SPAL Technique work? The SPAL Technique applies the principles of bone regeneration through the creation of a subperiosteal space that accommodates autologous bone or grafting material. The periosteum, preserved intact and vascularized, is carefully elevated to ensure osteogenic cells and vessels essential for bone regeneration, while also containing and stabilizing the graft.

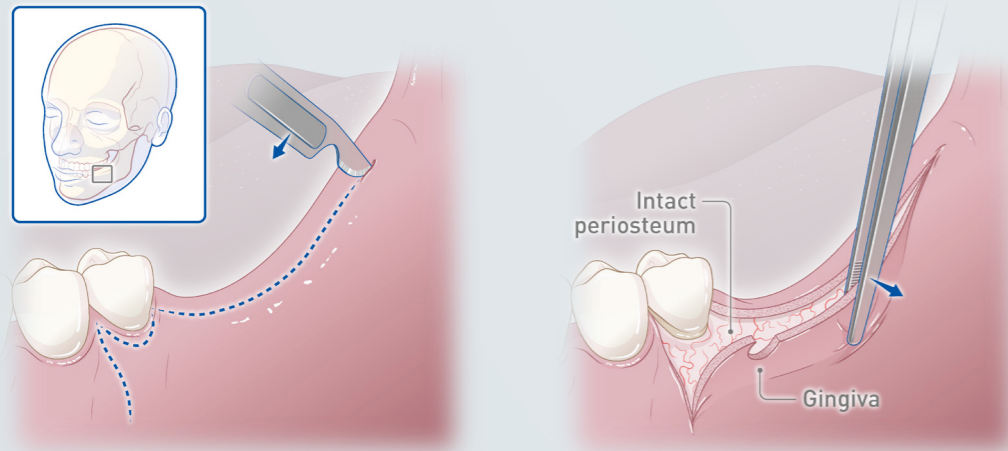
What are the biological principles behind the SPAL Technique? The periosteum is a highly vascularized tissue composed of functionally distinct layers. The outer fibrous layer provides resistance and elasticity, functioning as a containing membrane that protects and stabilizes the graft, while the inner cambium layer has osteoinductive properties that drive new bone formation.



The SPAL Technique – Step by Step

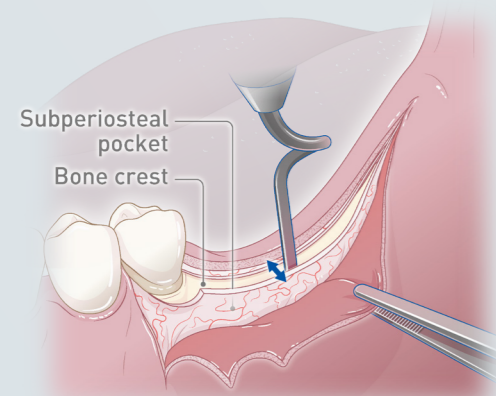
1 Flap elevation

Partial-thickness flap elevation to expose the periosteum covering the bone crest.



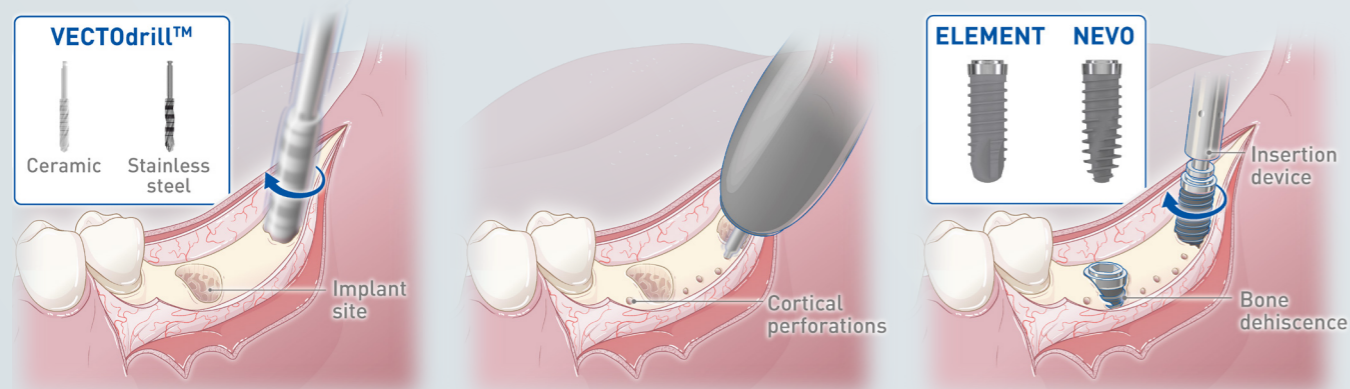
2 Periosteum elevation and pocket creation

Controlled detachment of the periosteum from the bone crest and formation of a subperiosteal pocket to accommodate the graft.



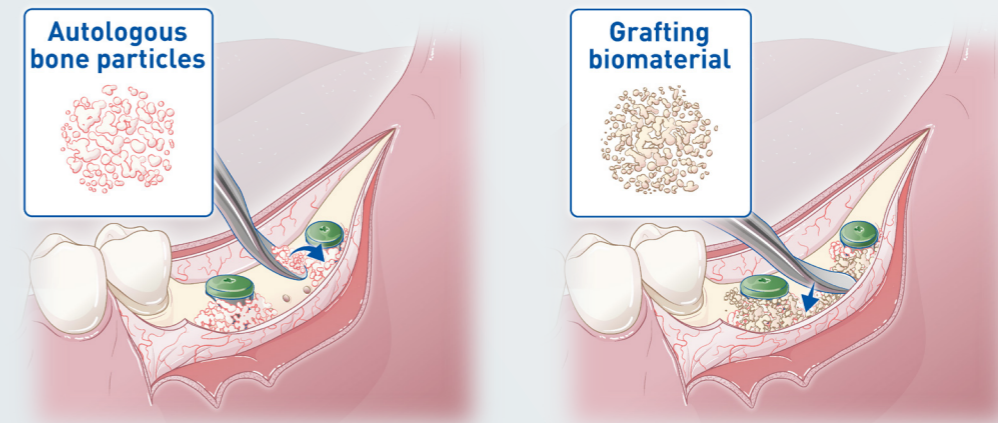
3 Preparation of implant sites, cortical perforations, and implant placement

Preparation of the implant beds and cortical microperforations, followed by implant placement in the planned areas.



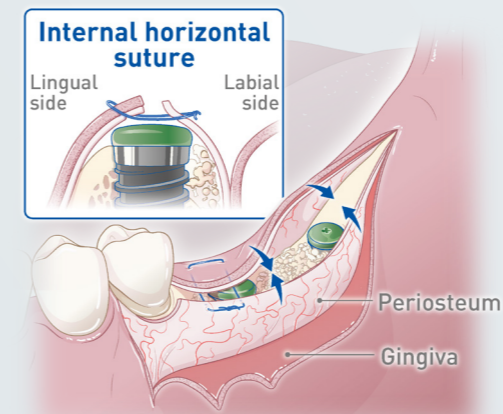
4 Filling of the pocket with graft material

Placement of autologous bone particles and graft biomaterial within the subperiosteal pocket to correct the peri-implant dehiscence and achieve adequate bone thickness.



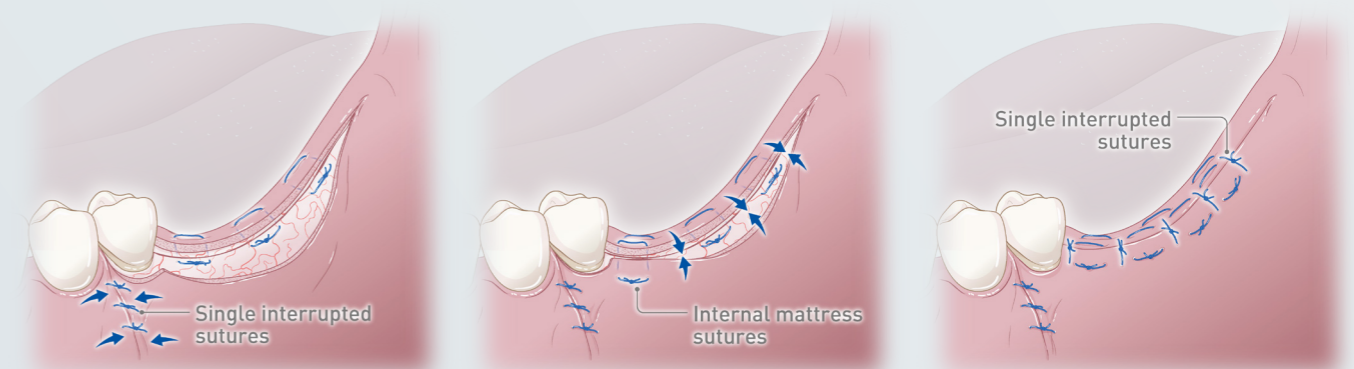
5 Stabilization of the periosteum to the lingual flap with an internal horizontal suture

Fixation of the periosteal flap to the lingual flap using horizontal mattress sutures to ensure stability of the graft and clot (wound stability).



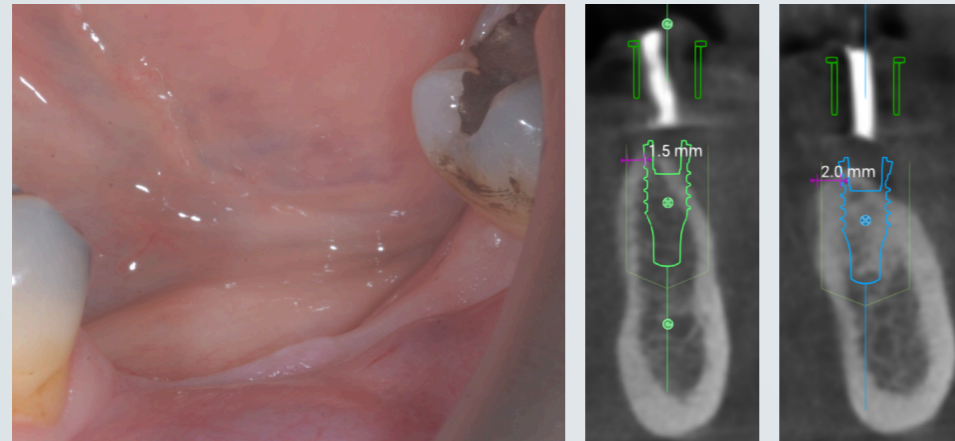
6 Closure of the mucosal flap with single interrupted sutures

Closure of the mucosal flap using internal mattress and single interrupted sutures to achieve primary closure.



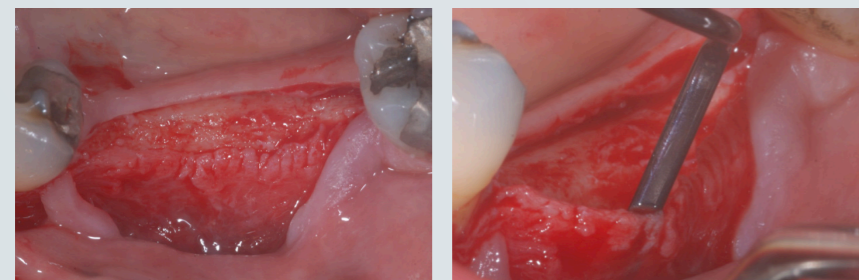
A Clinical Case with the SPAL Technique

Initial Situation



A 50-year-old female patient with an edentulous area in the posterior left mandible presented for implant-supported rehabilitation. The patient was enrolled in a periodontal maintenance program after treatment of stage II periodontitis. Digital planning for two implants suggested the possible development of a buccal dehiscence, highlighting the need for a horizontal bone-augmentation procedure.

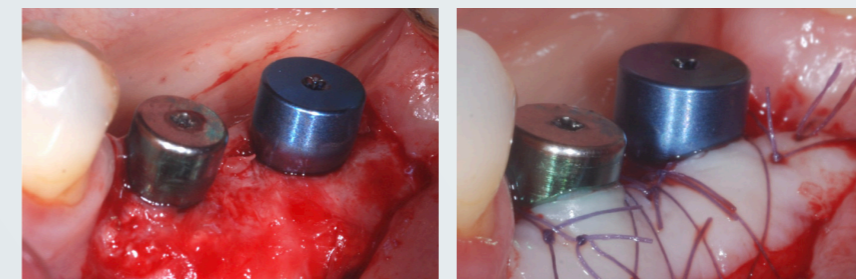
Treatment



1. Partial-thickness flap on the buccal side, leaving the periosteal layer intact over the edentulous crest.
2. Elevation of the periosteal layer through a crestal incision only.



3. Placement of two ELEMENT Regular Collar (RC) implants.
4. Adaptation of the graft beneath the periosteal layer to correct the dehiscence and increase buccal bone thickness.
5. Primary closure of the flap.



6. At 6-month re-entry, the augmented bone volume was protected with a connective-tissue graft to improve the height and thickness of the peri-implant soft tissues.



7. Fabrication of the definitive screw-retained zirconia restoration.

Watch a video of a SPAL procedure





Thommen Medical and the SPAL Technique

The SPAL Technique stands out for its simplicity and consistency with the biological principles of bone regeneration. In perfect harmony, the Thommen Medical implant system offers a straightforward and intuitive surgical approach designed to ensure precision, biological respect, and predictable outcomes.



NEVO

was developed to provide high primary stability, making it particularly suitable for cases where the SPAL technique is used in low-density bone.



ELEMENT

was designed for use in healed ridges, where it supports precise surgical management and controlled bone regeneration.



«The SPAL Technique, when combined with Thommen Medical implants, is easy to use and represents the perfect balance between scientific evidence and innovation.»

Prof. Leonardo Trombelli

Key scientific literature: The SPAL technique validated

Sub-periosteal peri-implant augmented layer technique for horizontal bone augmentation at implant placement

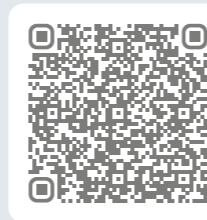
Leonardo Trombelli, Mattia Severi, Mattia Pramstraller, Roberto Farina

Minerva Stomatol. 2018 Oct;67(5):217-224.

What was done? First description of the SPAL technique in a case report, using a xenograft

What was seen? At implant uncovering after 4 months, an increase in buccal hard-tissue thickness was observed.

Conclusions: The SPAL technique may represent a surgical option for horizontal augmentation of peri-implant tissue thickness



A simplified soft tissue management for peri-implant bone augmentation

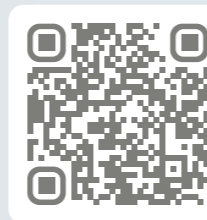
Leonardo Trombelli, Mattia Severi, Mattia Pramstraller, Roberto Farina

Int J Oral Maxillofac Implants. 2019 Jan/Feb;34(1):197-204

What was done? A clinical case series of 16 patients with 27 implants treated using the SPAL technique and a xenograft

What was seen? In nearly 80% of implants, complete resolution of the peri-implant dehiscence was achieved

Conclusions: The SPAL technique represents a simplified and reliable surgical approach for managing peri-implant dehiscences and achieving horizontal bone volume augmentation



Peri-implant tissue conditions at implants treated with Sub-periosteal Peri-implant Augmented Layer technique: A retrospective case series

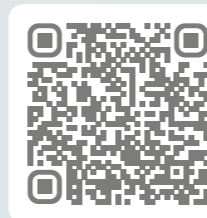
Leonardo Trombelli, Mattia Pramstraller, Mattia Severi, Anna Simonelli, Roberto Farina

Clin Oral Implants Res. 2020 Oct;31(10):992-1001

What was done? Evaluation of peri-implant tissue conditions in 34 patients treated with the SPAL technique

What was seen? After 6 months of prosthetic loading, patients treated with the SPAL technique showed limited peri-implant soft-tissue inflammation

Conclusions: The SPAL technique contributes to maintaining healthy and stable peri-implant tissue conditions after prosthetic loading, with low inflammation levels



Sub-Periosteal Peri-Implant Augmented Layer Technique to Treat Peri-Implantitis Lesions

Leonardo Trombelli, Mattia Severi, Roberto Farina, Anna Simonelli

Clin Adv Periodontics. 2020 Dec;10(4):169-174

What was done? Three clinical cases were presented to illustrate the use of the SPAL technique in the treatment of peri-implantitis lesions

What was seen? Treatment resulted in substantial reconstruction of peri-implant support, together with reduced probing depth and absence of inflammation

Conclusions: The SPAL technique may represent a surgical option for achieving reconstruction of bone defects associated with peri-implantitis



Peri-Implant Buccal Bone Dehiscence Following Sub-Periosteal Peri-Implant Augmented Layer Technique With Either Block or Particulate Xenograft: A Retrospective Study

Mattia Severi, Chiara Franzini, Anna Simonelli, Chiara Scapoli, Leonardo Trombelli

Clin Oral Implants Res. 2025 Apr;36(4):481-493

What was done? Comparative study evaluating the SPAL technique using DBBM applied either as block or as particulate graft

What was seen? No dehiscence was observed in the particulate group (n=14), while one dehiscence occurred in the block group (n=14). Buccal tissue thickness increased in both groups

Conclusions: SPAL, performed with either block or particulate DBBM, proved effective in correcting dehiscences and increasing buccal bone thickness



Histological Evaluation of Bone Regeneration Using the Subperiosteal Peri-implant Augmented Layer (SPAL) Technique Combined with Deproteinized Bovine Bone Mineral: A Case Report

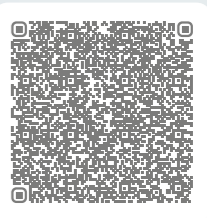
Mattia Severi, Chiara Franzini, Claudia Dellavia, Dolaji Henin, Gaia Pellegrini, Leonardo Trombelli

Int J Periodontics Restorative Dent 2025 Jul 1;0(0):1-22

What was done? Histological analysis of newly formed bone tissue in 6 patients treated with the SPAL technique and particulate DBBM.

What was seen? After 6 months, well-organized newly formed bone was observed in close contact with the residual graft material, with a mean percentage of new bone ranging from 33.54% to 65.68%

Conclusions: Histological analysis showed that the SPAL technique supports the formation of new, mature, well-organized bone in close contact with the residual DBBM particles





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Want to know more? We would love to hear from you!

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