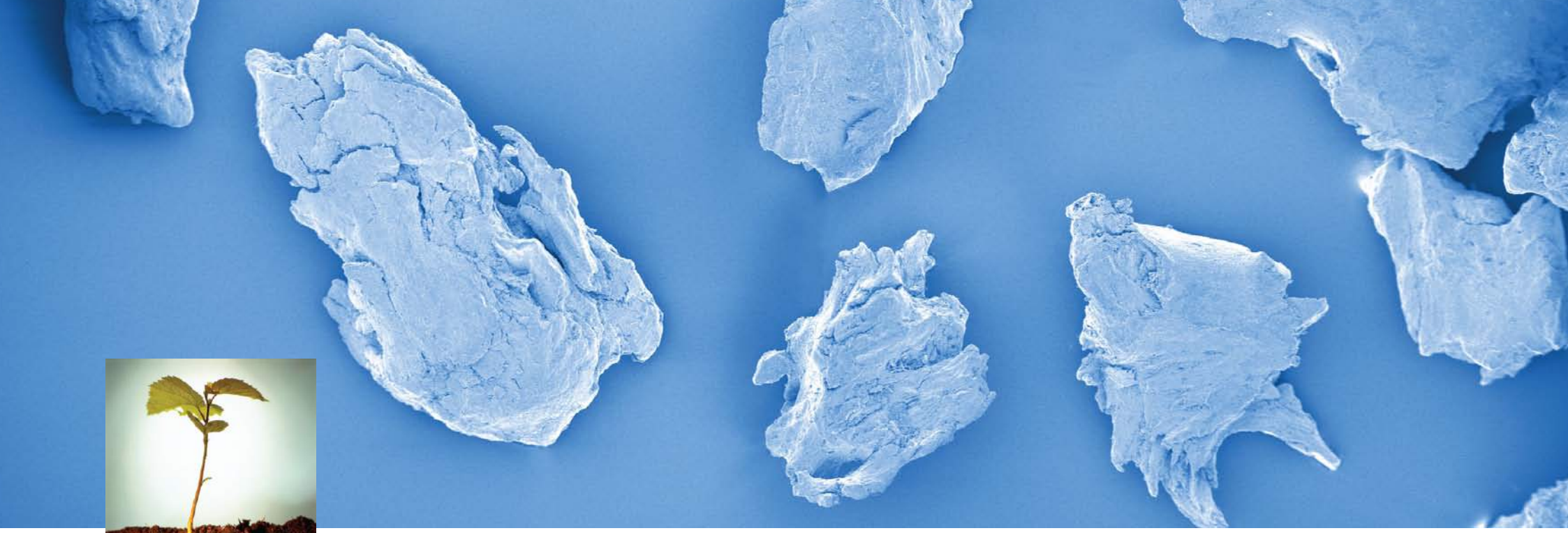
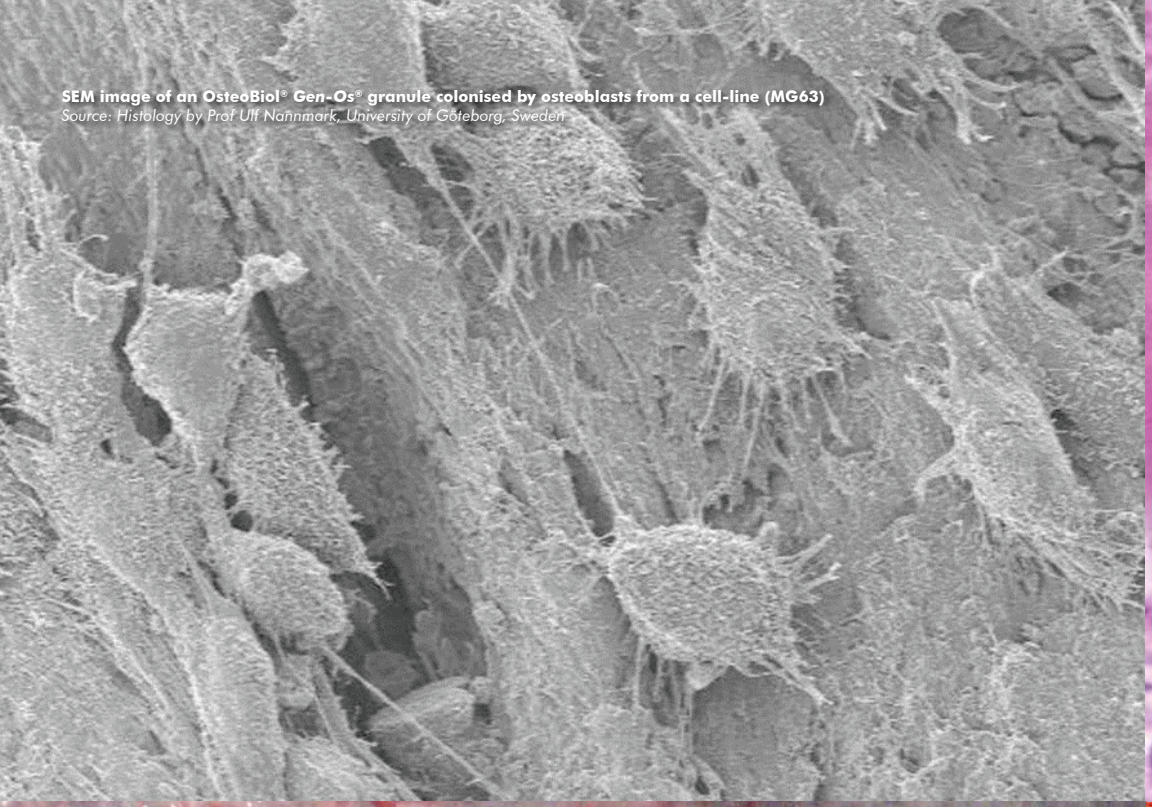


OsteoBiol®
by Tecnoss

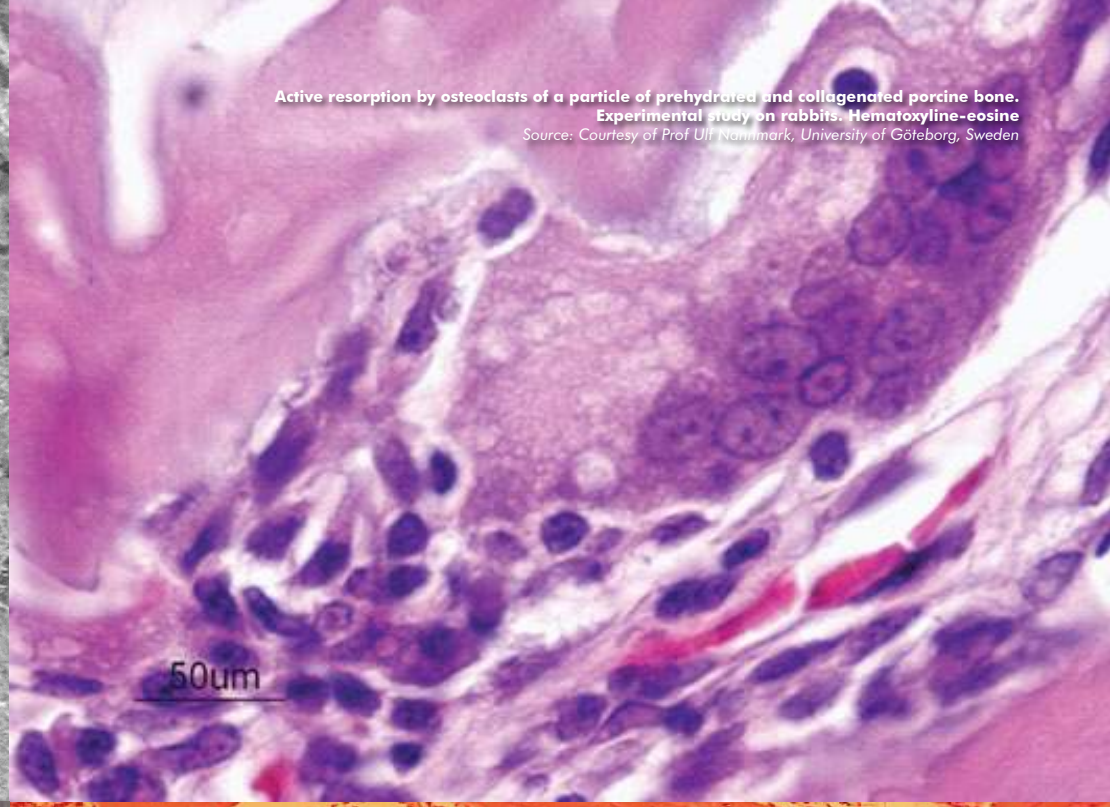
Bone Grafting Materials

REGENERATION SCIENCE

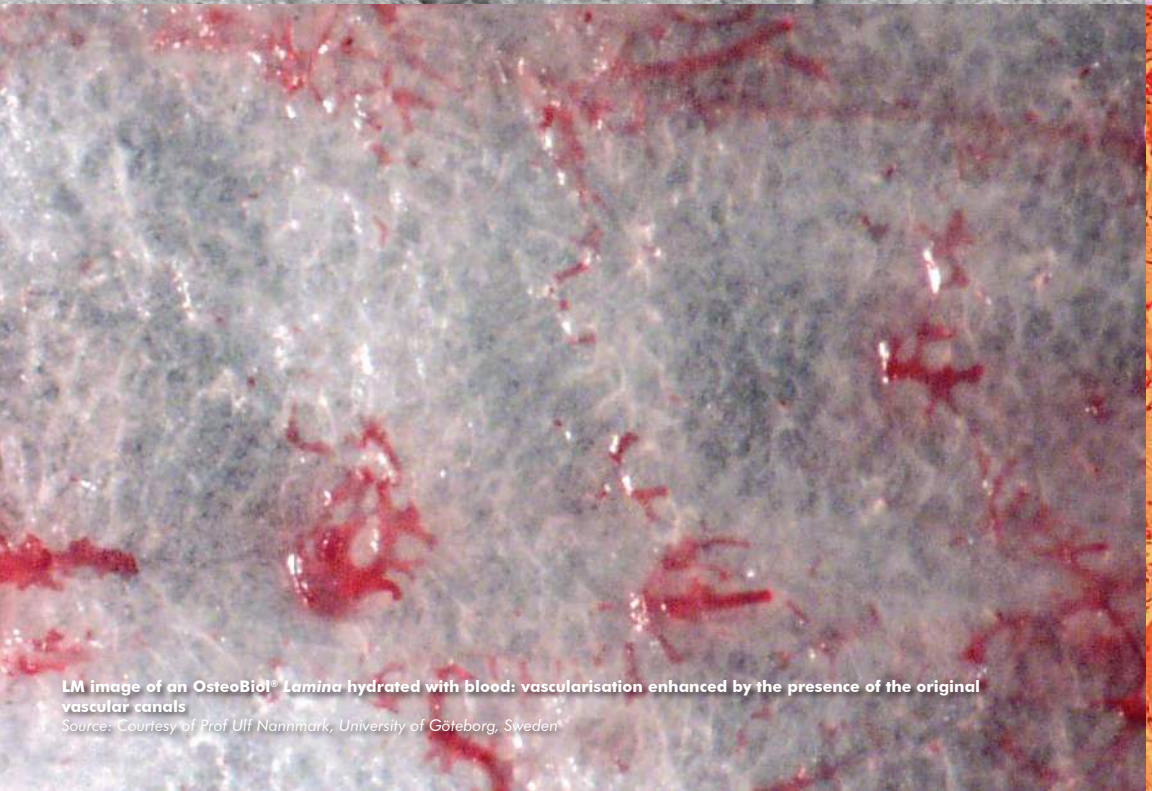
INSPIRED BY NATURE



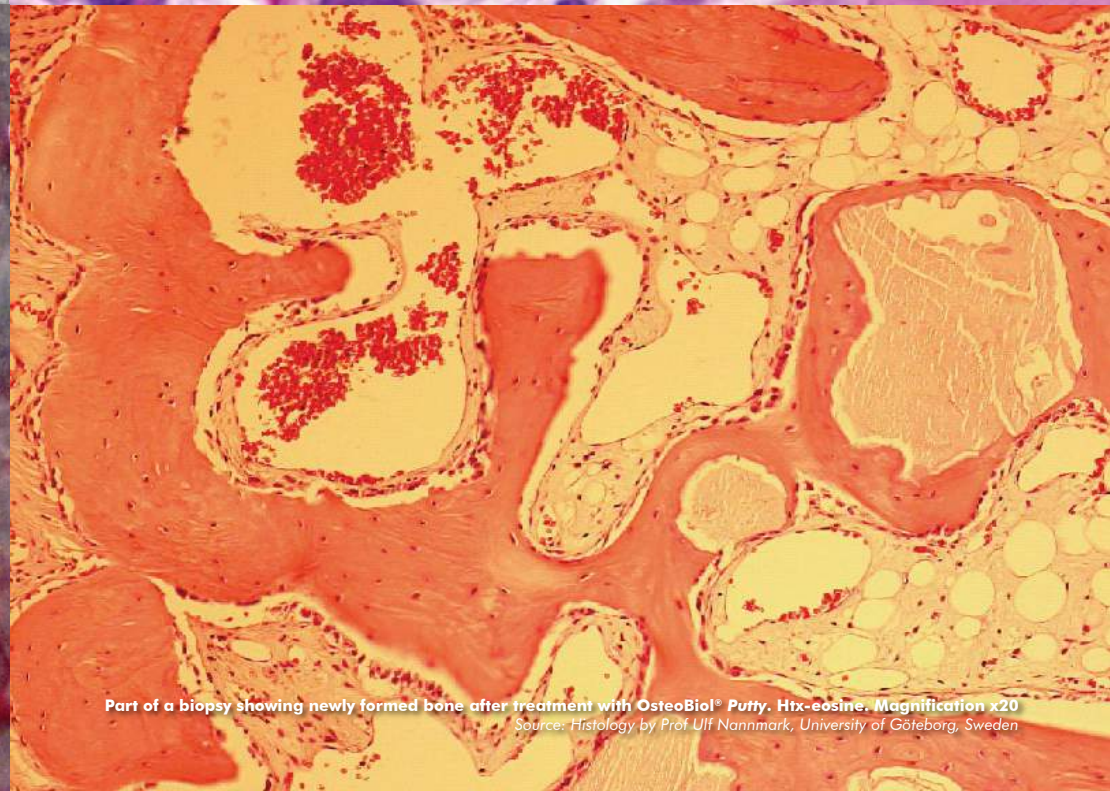
SEM image of an OsteoBiol® *Gen-Os*® granule colonised by osteoblasts from a cell-line (MG63)
Source: Histology by Prof Ulf Nannmark, University of Göteborg, Sweden



Active resorption by osteoclasts of a particle of prehydrated and collagenated porcine bone. Experimental study on rabbits. Hematoxyline-eosine
Source: Courtesy of Prof Ulf Nannmark, University of Göteborg, Sweden



LM image of an OsteoBiol® *Lamina* hydrated with blood: vascularisation enhanced by the presence of the original vascular canals
Source: Courtesy of Prof Ulf Nannmark, University of Göteborg, Sweden



Part of a biopsy showing newly formed bone after treatment with OsteoBiol® *Putty*. Htx-eosine. Magnification x20
Source: Histology by Prof Ulf Nannmark, University of Göteborg, Sweden

OUR MISSION

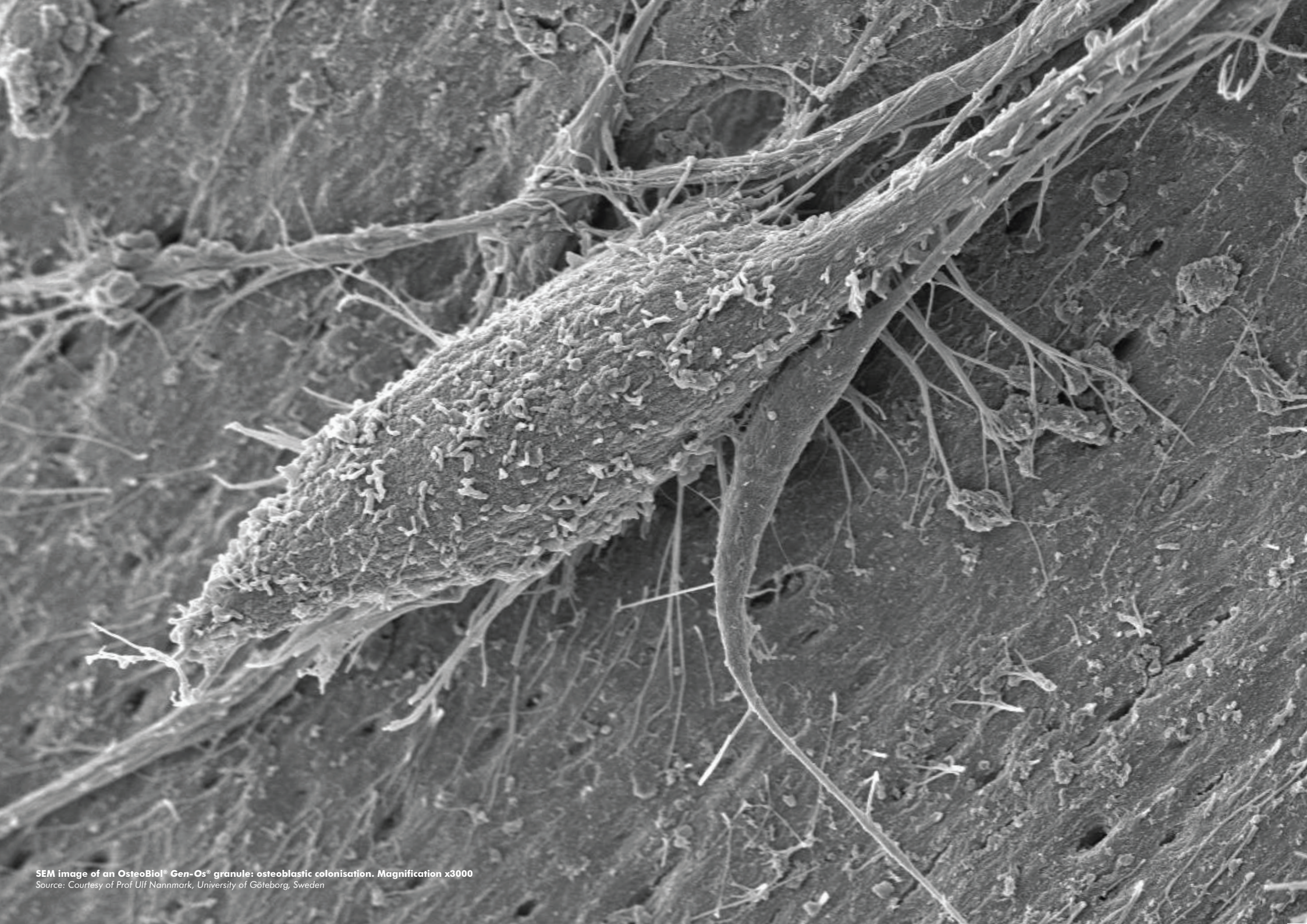
«To produce a xenogenic bone substitute as similar as possible to autogenous bone»

Giuseppe Oliva MD
R&D Director
Tecnoss S.r.l.

THE OSTEOBIOL® DUAL-PHASE HETEROLOGOUS BONE MATRIX

OsteoBiol® is the family of biomaterials produced by Tecnoss® for the dental and maxillo-facial surgeons.
In each OsteoBiol® granule, besides its mineral phase, the Tecnoss® process retains the xenogenic collagen phase with its precious biological properties, making it biocompatible and ideal for grafting and augmentation purposes.
Avoiding high process temperatures, the OsteoBiol® bone matrix prevents ceramization, maintaining a chemical composition extremely similar to autogenous bone[(1)], and therefore gradually resorbable and replaceable by newly formed bone.

(1) Figueiredo M, Henriques J, Martins G, Guerra F, Judas F, Figueiredo H
Physicochemical characterization of biomaterials commonly used in dentistry as bone substitutes - comparison with human bone
Journal of Biomedical Materials Research Part B: Applied Biomaterials, 2010 Feb; 92(2):409-19

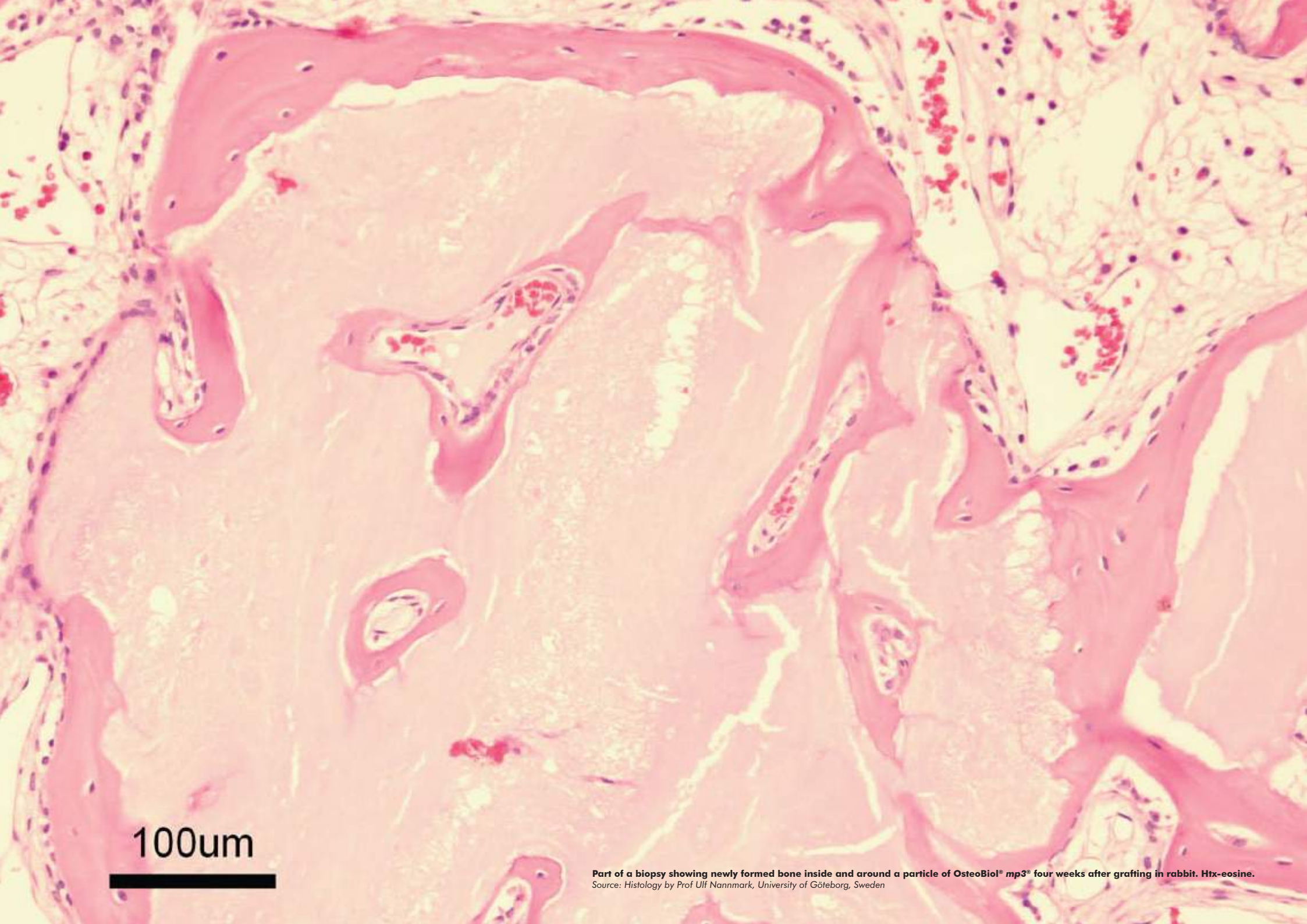


SEM image of an OsteoBiol® *Gen-Os*® granule: osteoblastic colonisation. Magnification x3000
Source: Courtesy of Prof Ulf Nannmark, University of Göteborg, Sweden

HIGH BIOCOMPATIBILITY

The chemical structure of each OsteoBiol® dual-phase granule, its ideal porosity and collagen content, make it a valid scaffold and substrate for osteoblasts anchorage, proliferation and new bone apposition[(2)].

(2) Nannmark U, Sennerby L
The bone tissue responses to prehydrated and collagenated cortico-cancellous porcine bone grafts: a study in rabbit maxillary defects
Clinical Implant Dentistry and Related Research, 2008 Dec;10(4):264-70



Part of a biopsy showing newly formed bone inside and around a particle of OsteoBiol® *mp3*® four weeks after grafting in rabbit. Htx-eosine.
Source: Histology by Prof Ulf Nannmark, University of Göteborg, Sweden

GRADUAL RESORPTION

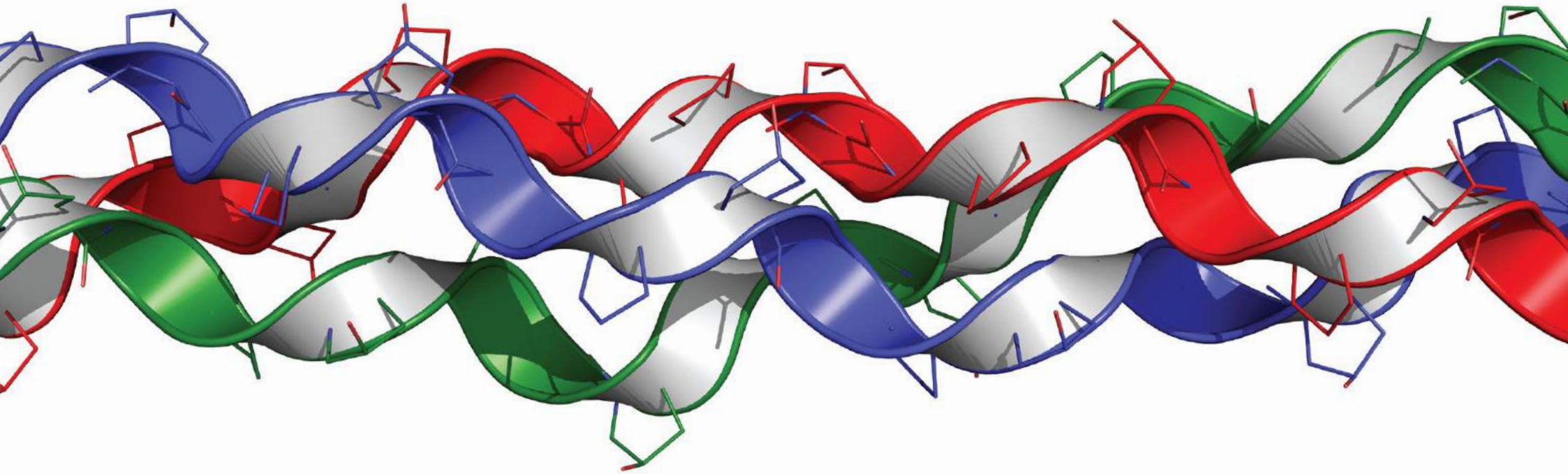
Autogenous bone is gradually replaced by newly formed bone: similarly, the OsteoBiol® bone matrix allows progressive osteoclastic resorption, with simultaneous new bone apposition.
Cells receive nutrients from newly formed vessels, that are able to colonize adequately the grafted site.
New bone grows in and around the OsteoBiol® granules[(3)], which are partially but significantly replaced by vital bone at re-entry time.

(3) Giuliani A, Iezzi G, Mazzoni S, Piattelli A, Perrotti V, Barone A
Regenerative properties of collagenated porcine bone grafts in human maxilla: demonstrative study of the kinetics by synchrotron radiation microtomography and light microscopy
Clinical Oral Investigations, 2018 Jan;22(1):505-513

VASCULARIZATION IS THE KEY FOR CLINICAL SUCCESS

Dual-phase biomaterials are progressively resorbed by osteoclasts and replaced by new vital bone produced by osteoblasts, similarly to autogenous bone grafts. Both types of cells live thanks to blood supply, which is critical and essential for the success of any bone regeneration procedure.
The progressive resorption of OsteoBiol® granules allows an adequate colonization of the grafting site by new vessels, and is therefore a positive and significant factor within the regenerative process[4].

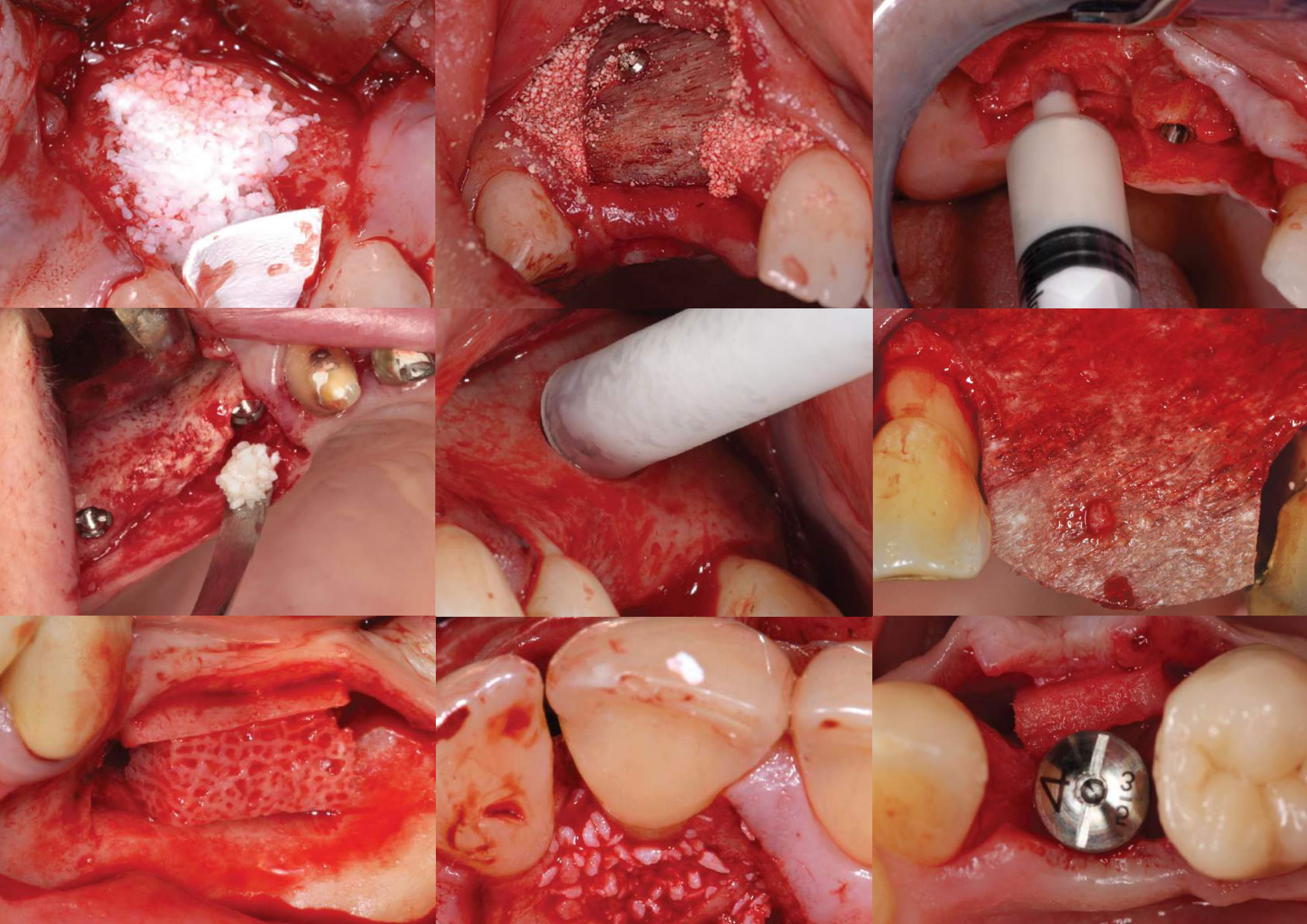
(4) Rombouts C, Jeanneau C, Camilleri J, Laurent P, About I
Characterization and angiogenic potential of xenogeneic bone grafting materials: Role of periodontal ligament cells
Dental Materials Journal, 2016 Dec 1;35(6):900-907



THE ROLE OF COLLAGEN

Collagen favours MSC differentiation and enhances osteoblasts proliferation[(5)]: it is considered as the ideal substrate for bone forming cells. OsteoBiol® dual-phase particulate bone substitutes contain approximately 22% collagen.
Furthermore, collagen gel mixed with dual-phase collagenated granules packed in syringes improves the handling and the stability of the graft, reducing also operatory time and risk of contamination.

(5) Brunelli G, Sollazzo V, Carinci F, Palmieri A, Girardi A, Monguzzi R
OsteoBiol® influences osteogenic differentiation of adipose derived stem cells
European Journal of Inflammation, 2011, Vol. 9, no. 3 (S), 103-107



A SPECIFIC PRODUCT FOR EVERY CLINICAL INDICATION

OsteoBiol® is not only a marvellous collagenated bone matrix: it is a complete family of biomaterials specifically designed for bone and soft tissue augmentation in dentistry. For every clinical indication a dedicated product has been developed, with the goal of providing the best handling, the ideal granulometry and consistency, and finally optimal regenerative results in adequate re-entry time.
Enjoy one of the widest and most complete product ranges, with the security and support of 15 years of clinical research: you will experience that today it is finally possible to achieve predictable clinical success[(6)] without the availability limitations of autogenous bone.

(6) Checchi V, Felice P, Zucchelli G, Barausse C, Piattelli M, Pistilli R, Grandi G, Esposito M
Wide diameter immediate post-extractive implants vs delayed placement of normal-diameter implants in preserved sockets in the molar region: 1-year post-loading outcome of a randomised controlled trial
European Journal of Oral Implantology, 2017;10(3):263-278

OsteoBiol® and natural human bone have the same density and very similar physico-chemical properties

Figueiredo et al. J Biomed Mater Res B: Appl Biomater, 2010 Feb; 92(2):409-19

Mineral content

64,6%

Gen-Os®

65%

Natural Human Bone

Figueiredo et al. J Biomed Mater Res B: Appl Biomater, 2010 Feb; 92(2):409-19

Gen-Os® has a higher angiogenic potential compared to anorganic xenografts

Rombouts et al. Dent mater J, 2016 Dec 1;35(6):900-907

New bone

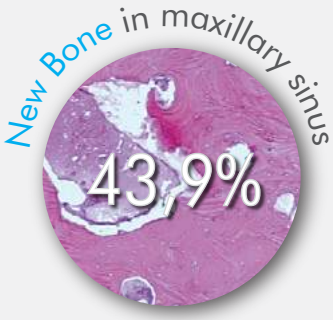
51,9%

In regenerated sockets after 12 months

Giuliani et al. Clin Oral Investig, 2018 Jan;22(1):505-513

In ridge preservation collagenated biomaterials show significant smaller volume reduction and basal area shrinkage compared to slowly resorbable xenografts

Barone et al. Clin Oral Implants Res, 2016 Nov;27(11):E105-E115



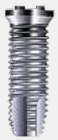
New Bone in maxillary sinus augmentation after 6 months

Barone et al. Clin Impl Dent Rel Res, 2012 Jun;14(3):373-9

OsteoBiol® bone matrix promotes osteoblast differentiation and bone regeneration

Brunelli et al. Eur J Inflamm, 2011, Vol. 9, no. 3 (S), 103-107

Implant Success Rate



95,4%

in preserved sockets after 12 months from loading

Checchi et al. Eur J Oral Implantol, 2017;10(3):263-278

OsteoBiol® bone scaffolds absorb growth factors secreted by MSCs and improve bone tissue repair

Mijiritsky et al. Materials, 2017 Sep 8;10(9)

KEY SCIENTIFIC DATA

Over 120 articles have been published on peer-reviewed journals during the last 15 years, proving with in-vitro, experimental and clinical studies the outstanding biological properties and clinical performance of the OsteoBiol® collagenated biomaterials.

For further information see the complete literature on p. 114

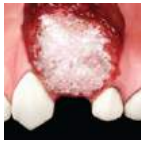
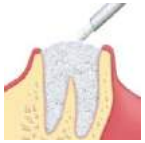
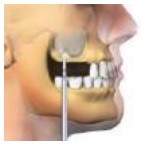
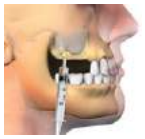
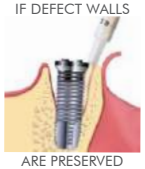
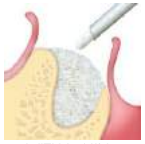
PATIENTS FIRST

Combining the best skills and the best materials, within the limits and guidelines provided by scientific evidence, is the key for clinical success: however let us all remember that the patients are and will always be the center of all our attentions.
Meeting their expectations, helping them to recover function and aesthetics with long term success[7,8] is the greatest reward for any surgeon and fulfillment of our company mission.

(7) Barone A, Orlando B, Tonelli P, Covani U
Survival rate for implants placed in the posterior maxilla with and without sinus augmentation: a comparative cohort study
Journal of Periodontology, 2011 Feb; 82(2):219-26

(8) Scarano A, Piattelli A, Assenza B, Quaranta A, Perrotti V, Piattelli M, Iezzi G
Porcine bone used in sinus augmentation procedures: a 5-year retrospective clinical evaluation
Journal of Oral and Maxillofacial Surgery, 2010 Aug;68(8):1869-73

OsteoBiol® products vs clinical indications

	Gen-Os®	mp3®	Putty	Gel 40
	Collagenated heterologous cortico-cancellous bone mix *Granulometry 250-1000 µm* **For information on OsteoBiol® *Gen-Os*® see page 24**	Pre-hydrated collagenated heterologous cortico-cancellous bone mix *Granulometry 600-1000 µm* **For information on OsteoBiol® *mp3*® see page 32**	Pre-hydrated collagenated heterologous cortico-cancellous bone paste *Granulometry up to 300 µm* **For information on OsteoBiol® *Putty* see page 36**	Pre-hydrated collagenated heterologous cortico-cancellous bone gel *Granulometry up to 300 µm* **For information on OsteoBiol® *Gel 40* see page 40**
ALVEOLAR REGENERATION	  IN ASSOCIATION WITH TSV GEL			
MAXILLARY SINUS LIFT	 			 CRESTAL ACCESS ONLY
PERI-IMPLANT DEFECTS			 IF DEFECT WALLS ARE PRESERVED	
HORIZONTAL AUGMENTATION	IN ASSOCIATION  WITH LAMINA AND TSV GEL	IN ASSOCIATION  WITH LAMINA		
VERTICAL AUGMENTATION INLAY TECHNIQUE		IN ASSOCIATION  WITH SP-BLOCK		
PERIODONTAL REGENERATION				 3-WALL DEFECTS
SOFT TISSUE AUGMENTATION				

Apatos

Cortico-cancellous and cortical bone
Granulometry 600-1000 µm
For information on OsteoBiol® *Apatos*
see page 44

Sp-Block

Collagenated heterologous cancellous block
For information on OsteoBiol® *Sp-Block*
see page 50

Evolution

Heterologous collagen membrane
For information on OsteoBiol® *Evolution*
see page 58

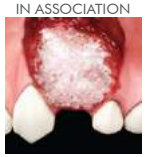
Lamina

Collagenated heterologous cortical bone
For information on OsteoBiol® *Lamina*
see page 66

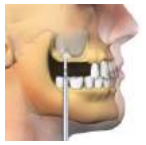
Derma

Collagen dermal matrix
For information on OsteoBiol® *Derma*
see page 62

IN ASSOCIATION

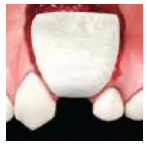


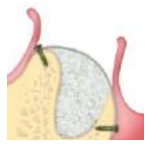
WITH TSV GEL



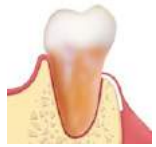
IN ASSOCIATION

WITH LAMINA AND TSV GEL

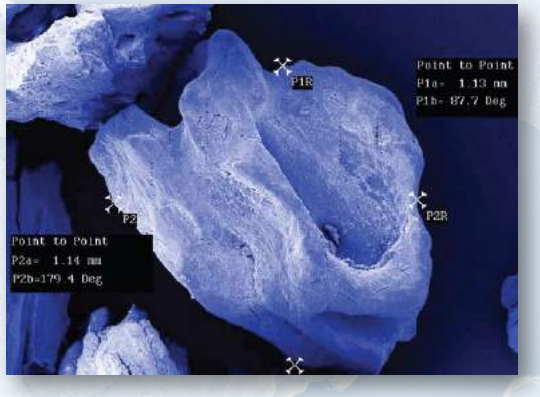


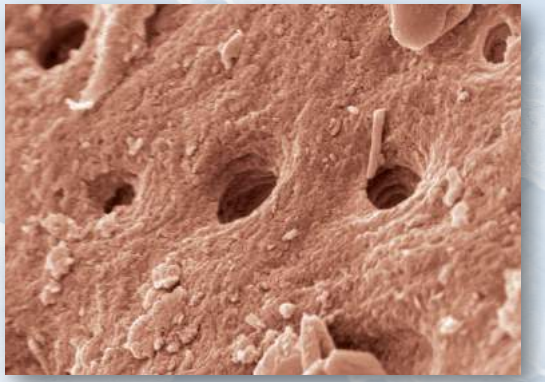


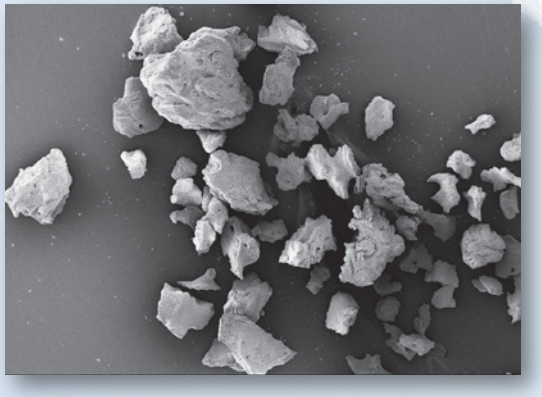
BONE LAYER TECHNIQUE

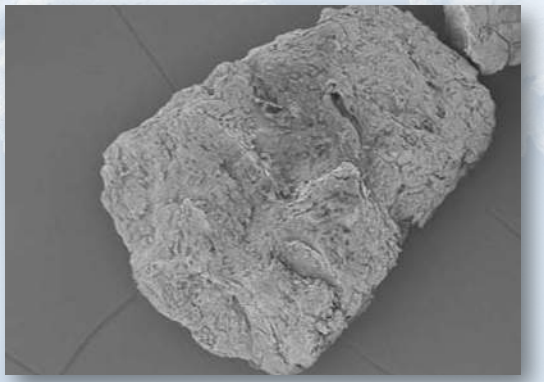


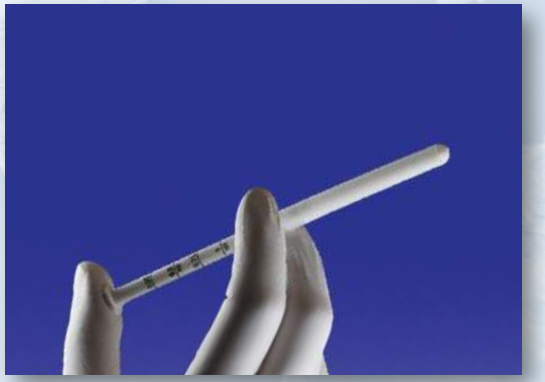
BONE SUBSTITUTES











OsteoBiol® bone substitutes

HETEROLOGOUS BONE

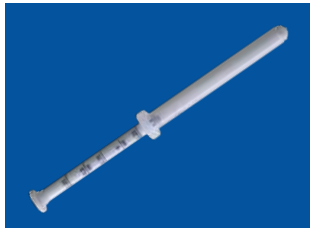
CORTICAL BONE — CANCELLOUS BONE

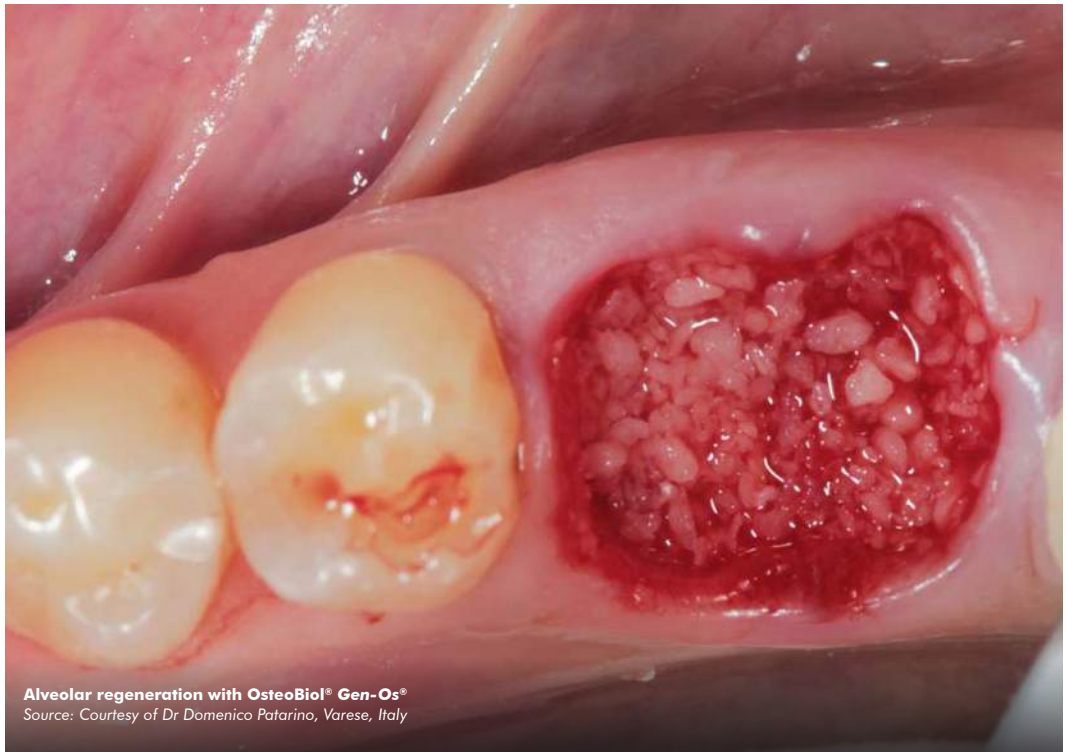
Collagenated mix

Collagen gel

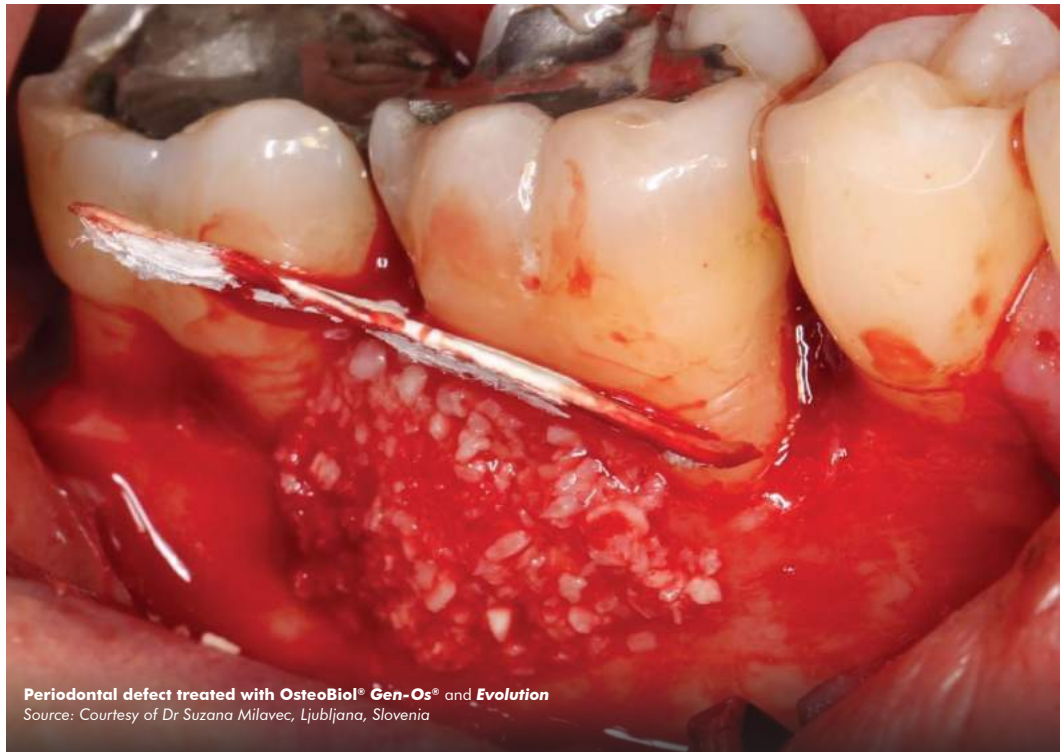
Apatos Cortical

cortical bone

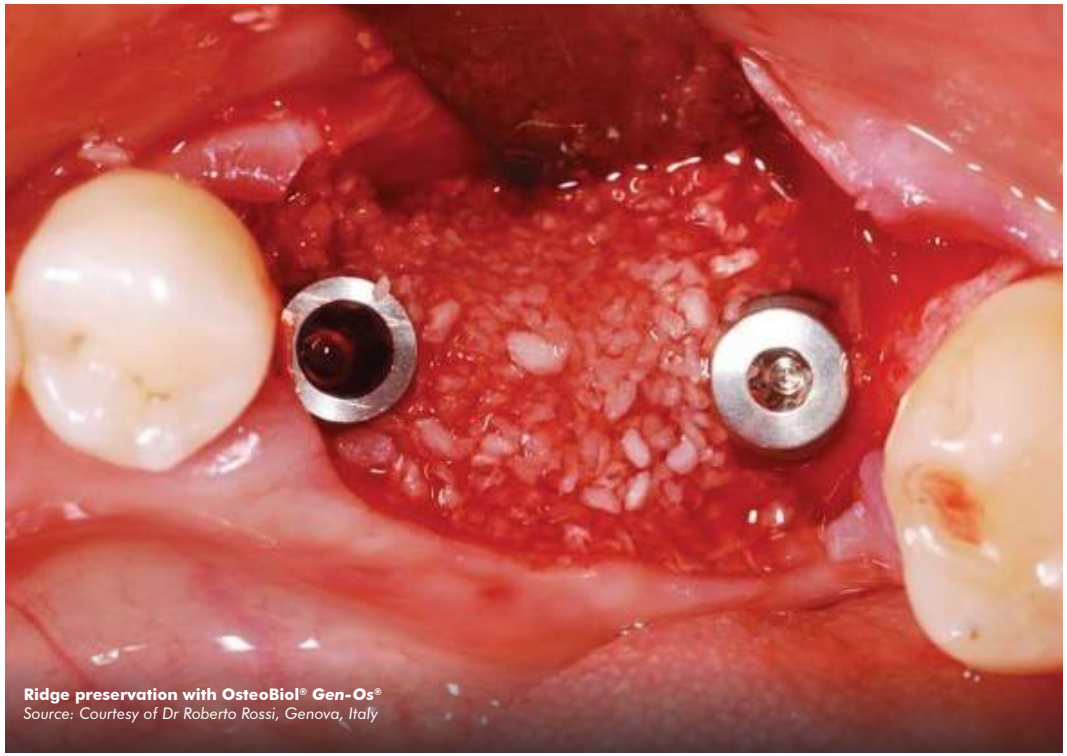
Gen-Os®	mp3®	Putty	Gel 40	Apatos Mix
	Pre-hydrated	Pre-hydrated	Pre-hydrated	
100% collagenated bone mix	*90% collagenated bone mix* *10% collagen gel*	*80% collagenated bone mix* *20% collagen gel*	*60% collagenated bone mix* *40% collagen gel*	*cortico-cancellous bone mix*
				
Heterologous cortico-cancellous collagenated bone mix	**Heterologous cortico-cancellous collagenated pre-hydrated bone mix**	**Heterologous cortico-cancellous collagenated pre-hydrated bone paste**	**Heterologous cortico-cancellous collagenated pre-hydrated bone gel**	**Heterologous microcrystalline hydroxyapatite**
For more information on OsteoBiol® *Gen-Os*® see page 24	For more information on OsteoBiol® *mp3*® see page 32	For more information on OsteoBiol® *Putty* see page 36	For more information on OsteoBiol® *Gel 40* see page 40	For more information on OsteoBiol® *Apatos* see page 44



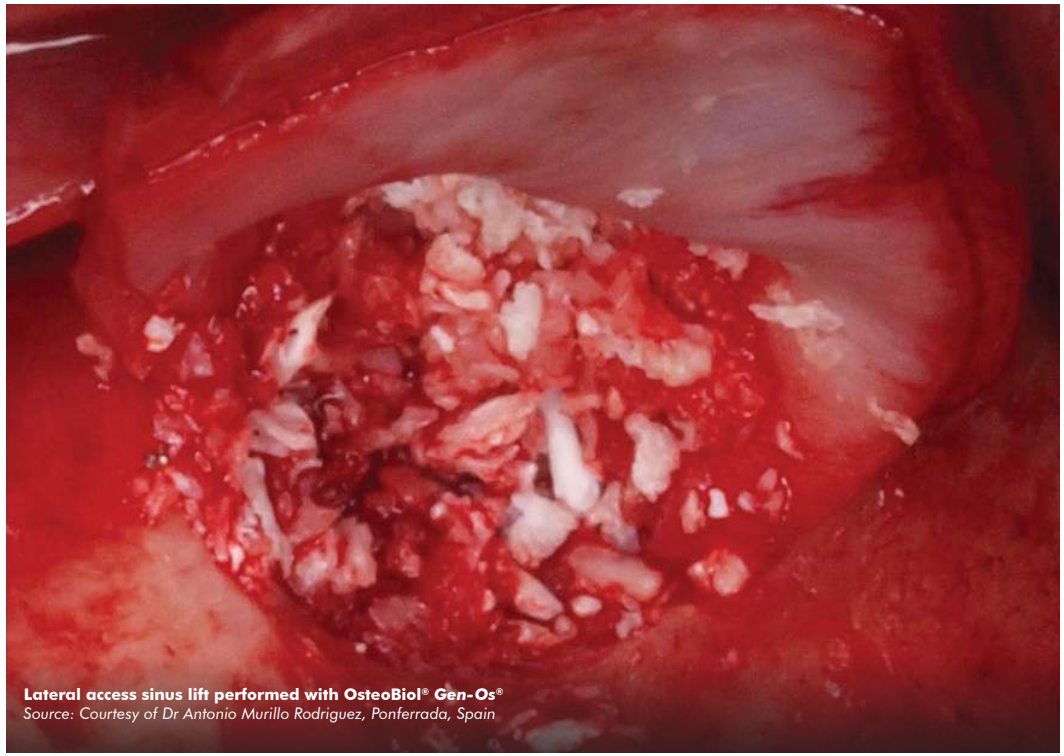
Alveolar regeneration with OsteoBiol® *Gen-Os*®
Source: Courtesy of Dr Domenico Patarino, Varese, Italy



Periodontal defect treated with OsteoBiol® *Gen-Os*® and *Evolution*
Source: Courtesy of Dr Suzana Milavec, Ljubljana, Slovenia



Ridge preservation with OsteoBiol® *Gen-Os*®
Source: Courtesy of Dr Roberto Rossi, Genova, Italy



Lateral access sinus lift performed with OsteoBiol® *Gen-Os*®
Source: Courtesy of Dr Antonio Murillo Rodriguez, Ponferrada, Spain

Gen-Os®

The advantages of a dual-phase biomaterial

Collagenated heterologous cortico-cancellous bone mix

Tissue of origin
Cortico-cancellous heterologous bone mix

Tissue collagen
Preserved

Physical form
Slightly radiopaque granules

Composition
100% granulated mix

Granulometry
250-1000 μm
1000-2000 μm

Re-entry time
4/5 months, depending on grafting site characteristics

Packaging
Vial: 0.25 g, 0.5 g, 1.0 g, 2.0 g

Product codes
250-1000 μm
M1052FS | 1 Vial | 0.25 g | Porcine
M1052FE | 1 Vial | 0.25 g | Equine
M1005FS | 1 Vial | 0.5 g | Porcine
M1005FE | 1 Vial | 0.5 g | Equine
M1010FS | 1 Vial | 1.0 g | Porcine
M1010FE | 1 Vial | 1.0 g | Equine
M1020FS | 1 Vial | 2.0 g | Porcine
M1020FE | 1 Vial | 2.0 g | Equine

1000-2000 μm
M0210FS | 1 Vial | 1.0 g | Porcine
M0220FS | 1 Vial | 2.0 g | Porcine

GMDN code
38746

Characteristics and handling

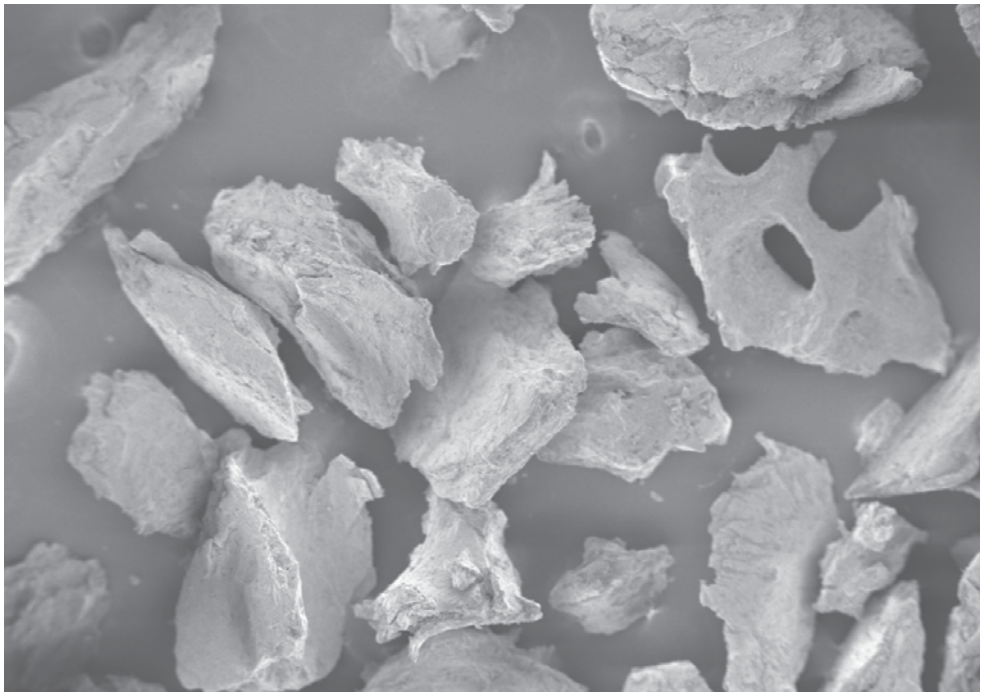
CHARACTERISTICS

A natural replicate of autologous bone, *Gen-Os*® conserves the same intimate structures[1] (matrix and porous form) and presents highly osteoconductive properties[2,3]. It is biocompatible and bioavailable, as recognized by tests made according to the ISO 10993 method conducted at Eurofins Biolab. *Gen-Os*® is gradually resorbable and provides support in bone neoformation helping to preserve the original graft shape and volume[4].

Moreover, thanks to its collagen content, the product facilitates blood clotting and the subsequent invasion of repairing and regenerative cells, favouring restitutio ad integrum of missing bone. Because of its marked hydrophilia[5], it can function as a carrier for selected medications and drugs[6] and it is ideal to mix with GFs[7].

HANDLING

Gen-Os® must always be hydrated and thoroughly mixed with either a few drops of sterile physiological solution (or patient's blood) to activate its collagen matrix and to enhance its adhesivity or with *TSV Gel* to increase graft stability in not self-contained defects. If necessary it can as well be mixed with the drug selected for surgery.



SEM image of OsteoBiol® *Gen-Os*® granules. Magnif. x50
Source: Courtesy of Prof Ulf Nannmark, University of Göteborg, Sweden

Source: Tecnoss® Dental Media Library

Clinical Indications

free animated videos
on OsteoBiol® APP

Available on the App Store | Get it on Google play

Gen-Os®, a cortico-cancellous bone mix, has been the first product developed with the Tecnoss® innovative biotechnology and, due to its universal use, still is today the most demanded from the market. *Gen-Os*® has been successfully used and documented for alveolar ridge preservation[8] in combination with *Evolution* membranes: the application of this biomaterial limits significantly the alveolar ridge width reduction that would naturally occur with spontaneous healing, preserving thus the alveolar ridge volume and allowing a correct second stage implant placement[9]. *Gen-Os*® is also indicated for lateral access maxillary sinus lift[3] and dehiscence regeneration[10], always in association with *Evolution* membranes.

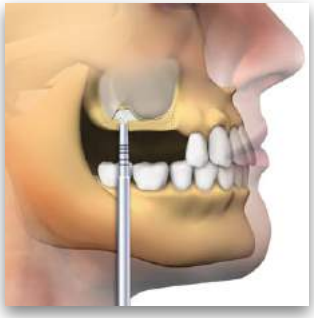
Gen-Os® is as well effective in periodontal regeneration of deep infrabony defects[11]. Due to its collagen content, once hydrated *Gen-Os*® becomes very sticky and hydrophylic[5]: it combines therefore extremely well with blood and is very stable once applied into the grafting site.

Its cortico-cancellous composition allows a progressive resorption of osteoclastic type, with in parallel a similar rate of new bone formation[2]: these unique properties allow a very good graft volume preservation, a healthy and well vascularized[12] new bony tissue and, ultimately, a successful implant rehabilitation.

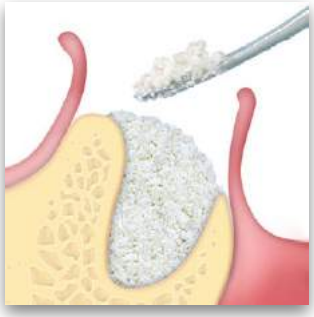
LATERAL ACCESS SINUS LIFT
maxillary sinus floor augmentation
case reports on page 84

DEHISCENCES AND FENESTRATIONS
peri-implant lesions
case reports on page 80

PERIODONTAL REGENERATION
intrabony defects
case reports on page 92



CRESTAL ACCESS SINUS LIFT
osteotome technique
case reports on page 82



HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 87

ALVEOLAR REGENERATION
socket preservation
case reports on page 77

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) FIGUEIREDO M, HENRIQUES J, MARTINS G, GUERRA F, JUDAS F, FIGUEIREDO H
PHYSICOCHEMICAL CHARACTERIZATION OF BIOMATERIALS COMMONLY USED IN DENTISTRY AS BONE SUBSTITUTES - COMPARISON WITH HUMAN BONE
J BIOMED MATER RES B APPL BIOMATER, 2010 FEB; 92(2):409-19

(2) NANNMARK U, SENNERBY L
THE BONE TISSUE RESPONSES TO PREHYDRATED AND COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS: A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2008 DEC;10(4):264-70

(3) CASSETTA M, PERROTTI V, CALASSO S, PIATTELLI A, SINJARI B, IEZZI G
BONE FORMATION IN SINUS AUGMENTATION PROCEDURES USING AUTOLOGOUS BONE, PORCINE BONE, AND A 50 : 50 MIXTURE: A HUMAN CLINICAL AND HISTOLOGICAL EVALUATION AT 2 MONTHS
CLIN ORAL IMPLANTS RES, 2015 OCT;26(10):1180-4

(4) CARDAROPOLI D, CARDAROPOLI G
PRESERVATION OF THE POSTEXTRACTION ALVEOLAR RIDGE: A CLINICAL AND HISTOLOGIC STUDY
INT J PERIODONTICS RESTORATIVE DENT, 2008 OCT; 28(5):469-77

(5) FIGUEIREDO A, COIMBRA P, CABRITA A, GUERRA F, FIGUEIREDO M
COMPARISON OF A XENOGENEIC AND AN ALLOPLASTIC MATERIAL USED IN DENTAL IMPLANTS IN TERMS OF PHYSICO-CHEMICAL CHARACTERISTICS AND IN VIVO INFLAMMATORY RESPONSE
MATER SCI ENG C MATER BIOL APPL, 2013 AUG 1;33(6):3506-13

(6) FISCHER KR, STAVROPOULOS A, CALVO GUIRADO JL, SCHNEIDER D, FICKL S
INFLUENCE OF LOCAL ADMINISTRATION OF PAMIDRONATE ON EXTRACTION SOCKET HEALING - A HISTOMORPHOMETRIC PROOF-OF-PRINCIPLE PRE-CLINICAL IN VIVO EVALUATION
CLIN ORAL IMPLANTS RES, 2015 OCT;26(10):1135-42

(7) MIJIRITSKY E, FERRONI L, GARDIN C, BRESSAN E, ZANETTE G, PIATTELLI A, ZAVAN B
PORCINE BONE SCAFFOLDS ADSORB GROWTH FACTORS SECRETED BY MSCS AND IMPROVE BONE TISSUE REPAIR
MATERIALS, 2017 SEP 8;10(9)

(8) CHECCHI V, FELICE P, ZUCCHELLI G, BARAUSSE C, PIATTELLI M, PISTILLI R, GRANDI G, ESPOSITO M
WIDE DIAMETER IMMEDIATE POST-EXTRACTIVE IMPLANTS VS DELAYED PLACEMENT OF NORMAL-DIAMETER IMPLANTS IN PRESERVED SOCKETS IN THE MOLAR REGION: 1-YEAR POST-LOADING OUTCOME OF A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2017;10(3):263-278

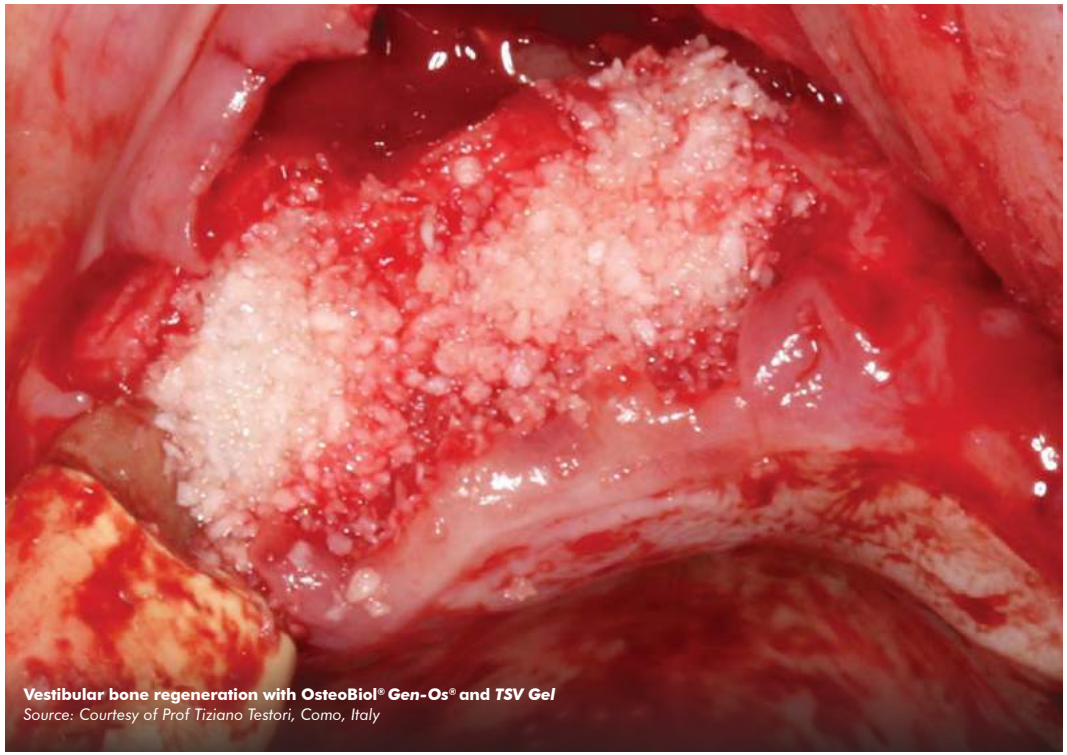
(9) FESTA VM, ADDABBO F, LAINO L, FEMIANO F, RULLO R
PORCINE-DERIVED XENOGRAFT COMBINED WITH A SOFT CORTICAL MEMBRANE VERSUS EXTRACTION ALONE FOR IMPLANT SITE DEVELOPMENT: A CLINICAL STUDY IN HUMANS
CLIN IMPLANT DENT RELAT RES, 2013 OCT;15(5):707-13

(10) CASSETTA M, RICCI L, IEZZI G, DELL'AQUILA D, PIATTELLI A, PERROTTI V
RESONANCE FREQUENCY ANALYSIS OF IMPLANTS INSERTED WITH A SIMULTANEOUS GRAFTING PROCEDURE: A 5-YEAR FOLLOW-UP STUDY IN MAN
INT J PERIODONTICS RESTORATIVE DENT, 2012 OCT;32(5):581-9

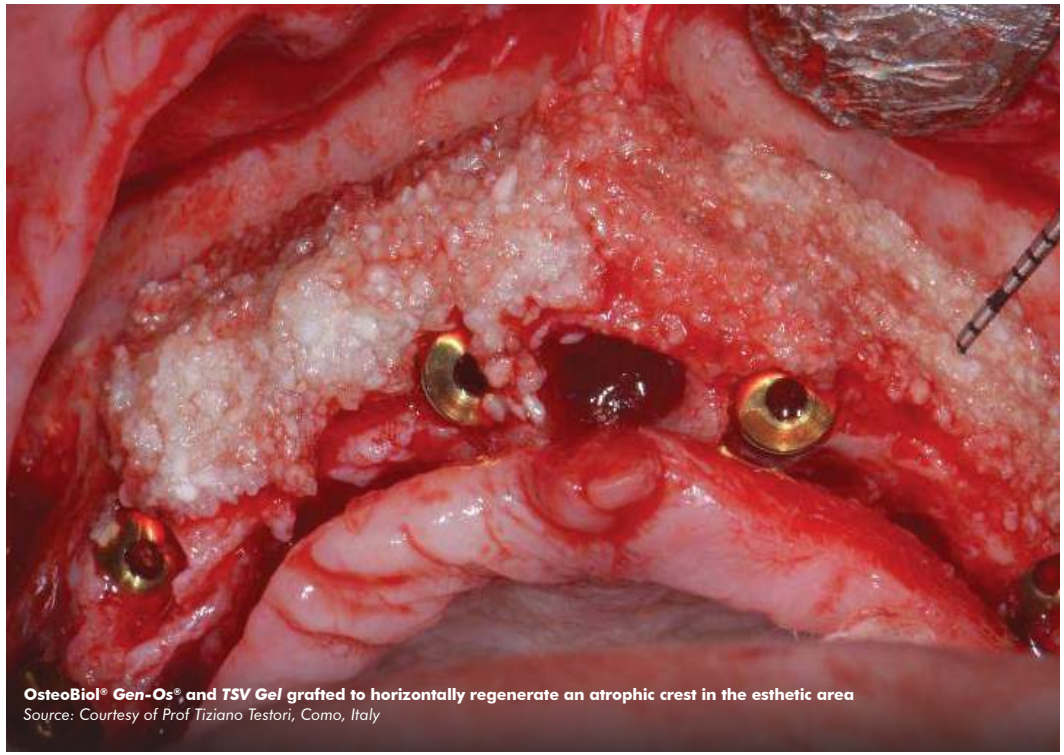
(11) ESPOSITO M, GRUSOVIN MG, LAMBERT F, MATOS S, PIETRUSKA M, ROSSI R, SALHI L, BUTI J
THE EFFECTIVENESS OF A RESORBABLE BONE SUBSTITUTE WITH A RESORBABLE MEMBRANE IN THE TREATMENT OF PERIODONTAL INFRABONY DEFECT - A MULTICENTER RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2015;8(3):233-244

(12) ROMBOUTS C, JEANNEAU C, CAMILLERI J, LAURENT P, ABOUT I
CHARACTERIZATION AND ANGIOGENIC POTENTIAL OF XENOGENEIC BONE GRAFTING MATERIALS: ROLE OF PERIODONTAL LIGAMENT CELLS
DENT MATER J, 2016 DEC 1;35(6):900-907

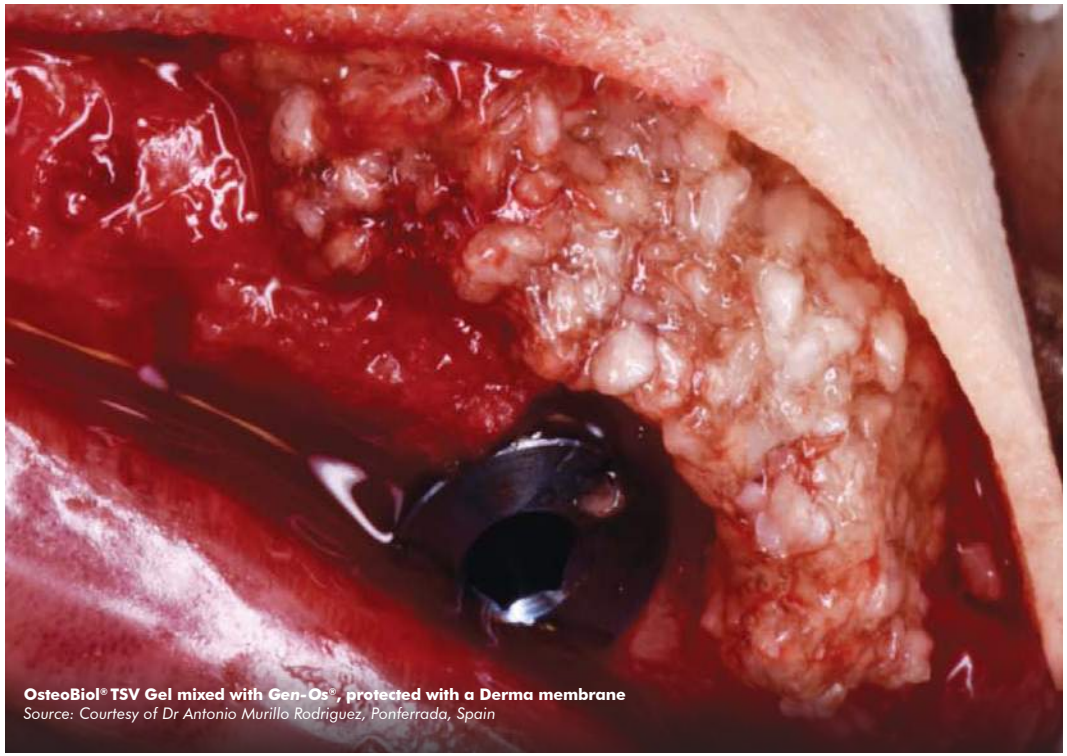
For further information see the complete literature on p. 114



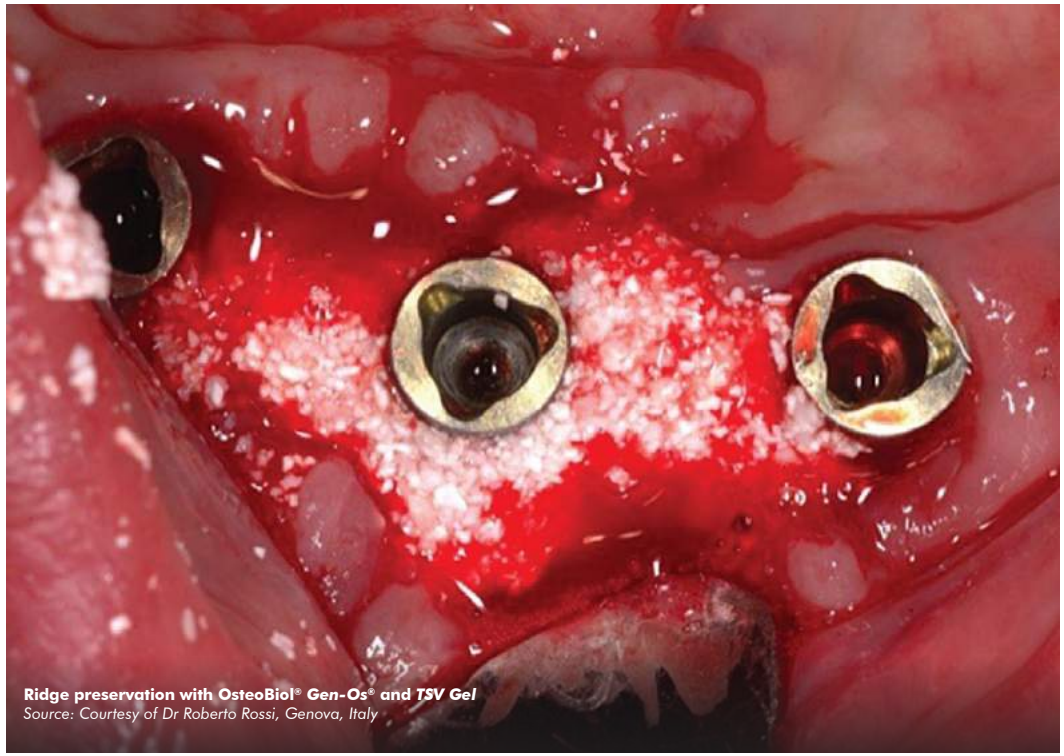
Vestibular bone regeneration with OsteoBiol® *Gen-Os*® and *TSV Gel*
Source: Courtesy of Prof Tiziano Testori, Como, Italy



OsteoBiol® *Gen-Os*® and *TSV Gel* grafted to horizontally regenerate an atrophic crest in the esthetic area
Source: Courtesy of Prof Tiziano Testori, Como, Italy



OsteoBiol® TSV Gel mixed with *Gen-Os*®, protected with a Derma membrane
Source: Courtesy of Dr Antonio Murillo Rodriguez, Ponferrada, Spain



Ridge preservation with OsteoBiol® *Gen-Os*® and *TSV Gel*
Source: Courtesy of Dr Roberto Rossi, Genova, Italy

TSV Gel

The resorbable solution for ideal graft stability

Thermosensitive resorbable gel for graft stabilization

Composition
Heterologous type I and III collagen gel
Thermogelling synthetic biocompatible copolymer

Physical form
LV phase at <8°C
Gel viscosity at >13°C

Packaging
Syringe: 0.5 cc, 1.0 cc

Available only in combination with OsteoBiol® *Gen-Os*® and *Apatos*
0.5 g, 1.0 g

Product codes
TSV005S | 1 Syringe | 0.5 cc | Porcine
TSV005E | 1 Syringe | 0.5 cc | Equine
TSV010S | 1 Syringe | 1.0 cc | Porcine
TSV010E | 1 Syringe | 1.0 cc | Equine

GMDN code
38746

Characteristics and handling

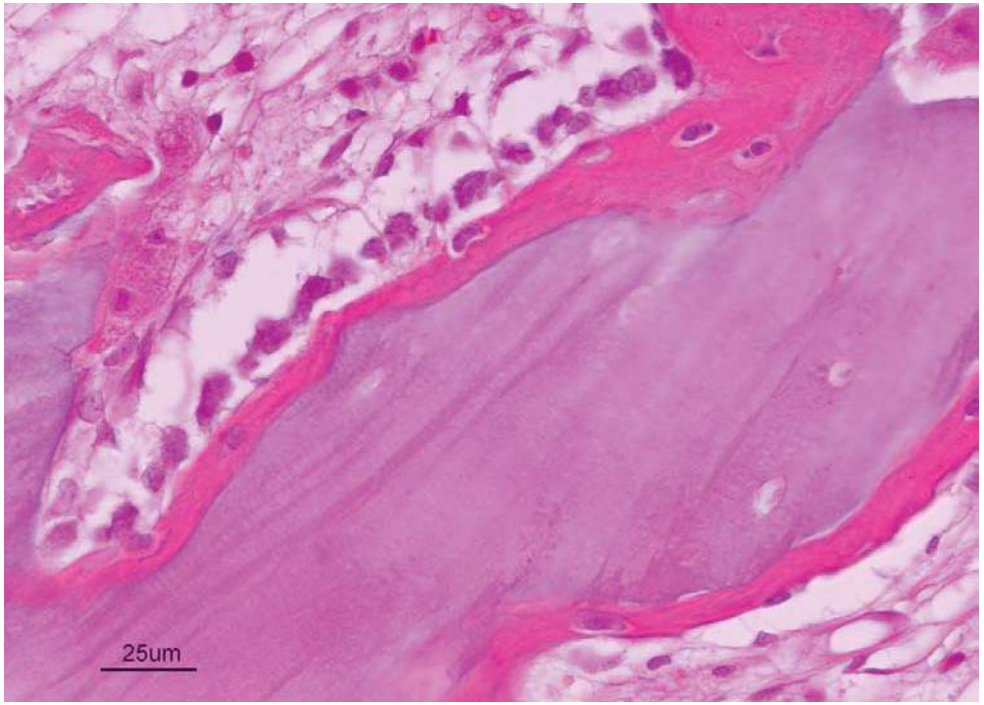
CHARACTERISTICS

The purpose of *TSV Gel* is to provide mechanical stability to bone substitutes and barrier membranes.

TSV Gel is sterilized by Gamma irradiation and is radio-transparent. It contains heterologous type I and III collagen gel with polyunsaturated fat acids diluted in aqueous solution containing a biocompatible synthetic copolymer that gives *TSV Gel* thermo-reversible and thermo-gelling properties. At low temperature (+4°C) the gel is relatively flowable and easy to mix and manipulate with graft but becomes more viscous when *in situ* and exposed to body temperature.

HANDLING

TSV Gel must be refrigerated for at least 20 minutes at +4°C before use, in order to reach the low viscosity (LV) phase, which makes it easier to mix with *Gen-Os*® or *Apatos*.
At room temperature, the product remains at LV phase for few minutes, whereas once *in situ* its viscosity quickly increases with body temperature. *TSV Gel* in LV phase can be used instead of saline for hydrating and mixing with *Gen-Os*® *or Apatos*. The result will be a sticky mixture easy to place and extremely stable once *in situ*.
TSV Gel can also be applied to the rough side of the *Evolution* membrane to stabilize it during graft covering and whilst suturing.



Part of a biopsy showing newly formed bone around a particle of OsteoBiol® *Gen-Os*® mixed with OsteoBiol® *TSV Gel* two weeks after grafting in rabbit. Htx-eosine.

Source: courtesy of Prof Ulf Nannmark, University of Göteborg, Sweden

Source: Tecnoss® Dental Media Library

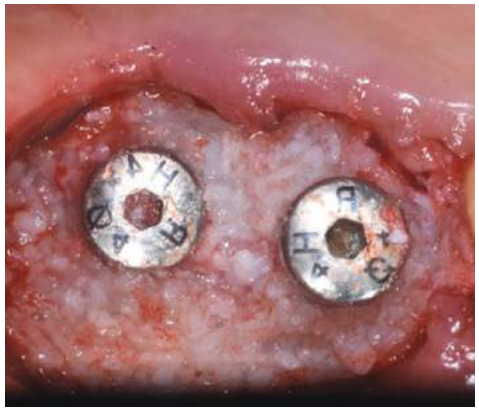
Source: Tecnoss® Dental Media Library

Clinical Indications

free animated videos
on OsteoBiol® APP

Available on the App Store | Get it on Google play

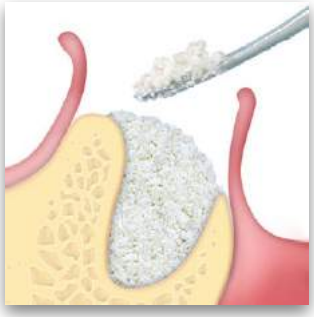
TSV Gel can be used in GBR procedures together with OsteoBiol® bone substitutes and membranes to enhance graft stability. The viscosity reached by *TSV Gel* at body temperature improves significantly the stability of *Gen-Os*® or *Apatos* granules and it is particularly beneficial in cases where there is little bony support around the defect *i.e.* lateral augmentation, sockets with a compromised buccal wall, dehiscences and periodontal two and one wall defects.
Additionally, the viscosity of OsteoBiol® *TSV Gel* improves the stability and handling of *Evolution* membranes, particularly during the delicate phase of flap closure.
TSV Gel can also be used as a cicatrizing agent for the treatment of cutaneous and mucosal lesions.



Peri-implant defect treated with OsteoBiol® *Gen-Os*® mixed with *TSV Gel*
Source: Courtesy of Dr Roberto Rossi, Genova, Italy

DEHISCENCES AND FENESTRATIONS
peri-implant lesions
case reports on page 80

PERIODONTAL REGENERATION
intrabony defects
case reports on page 92

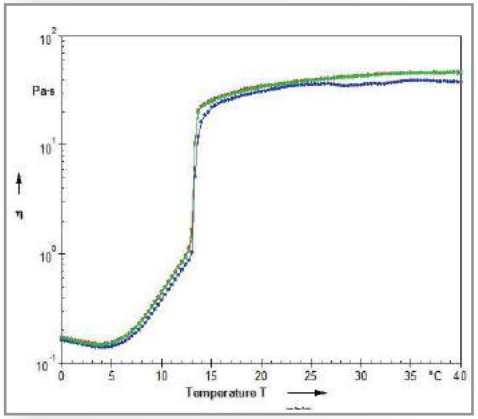


HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 87

ALVEOLAR REGENERATION
socket preservation
case reports on page 77

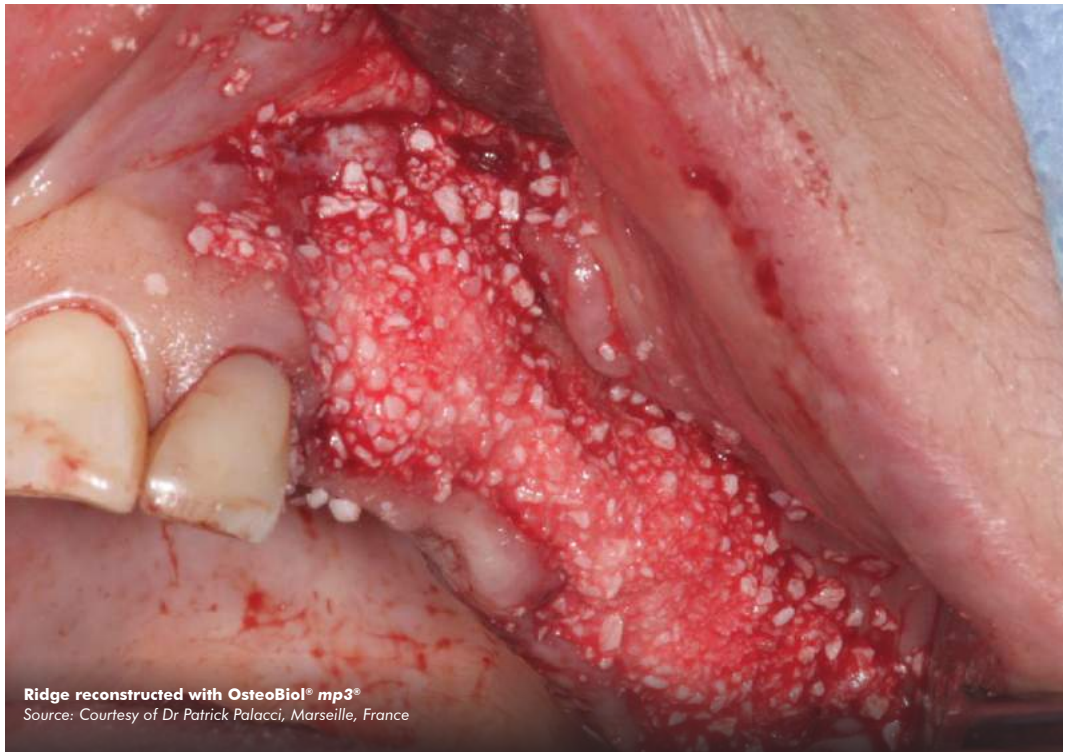
Additional case reports on osteobiol.com

OsteoBiol® *TSV Gel* GELIFICATION KINETICS

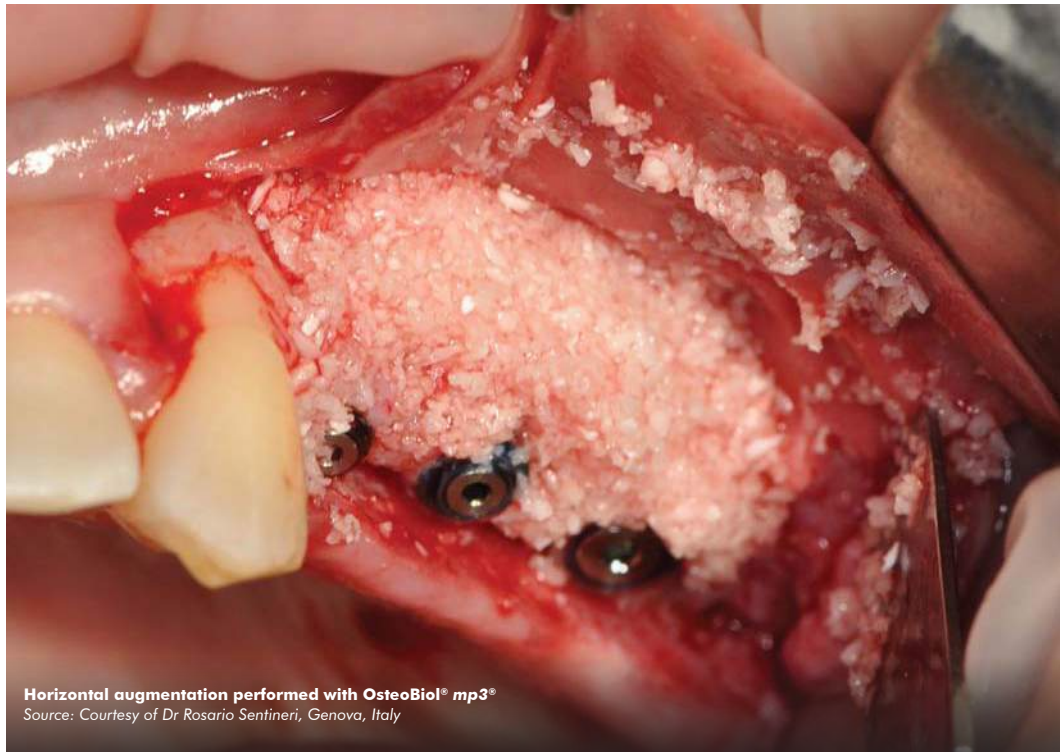


Source: Politecnico di Torino, Italy

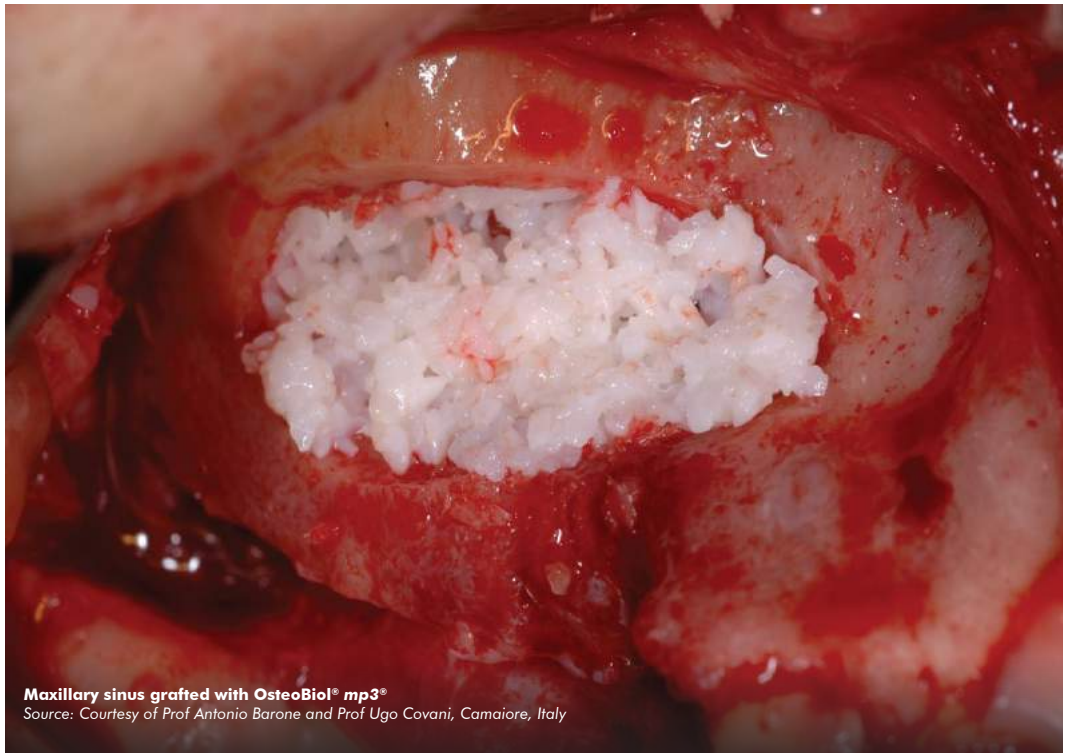
The graph shows the effect of temperature change on 3 *TSV Gel* samples.
As temperature increases from 0°C (1°C/min), the viscosity of the gel reaches its minimum at 4°C.
It then increases rapidly until it plateaus at 13°C. At room and body temperature *TSV Gel* is gel-like. It does not harden but keeps a soft consistency that allows the mixture with *Gen-Os*® or *Apatos* granules. Thanks to the hydrophilic properties of OsteoBiol® bone substitutes, the mixture becomes a sticky, stable conglomerate that can easily be placed in the defect site.
TSV Gel is biocompatible and rapidly resorbed.



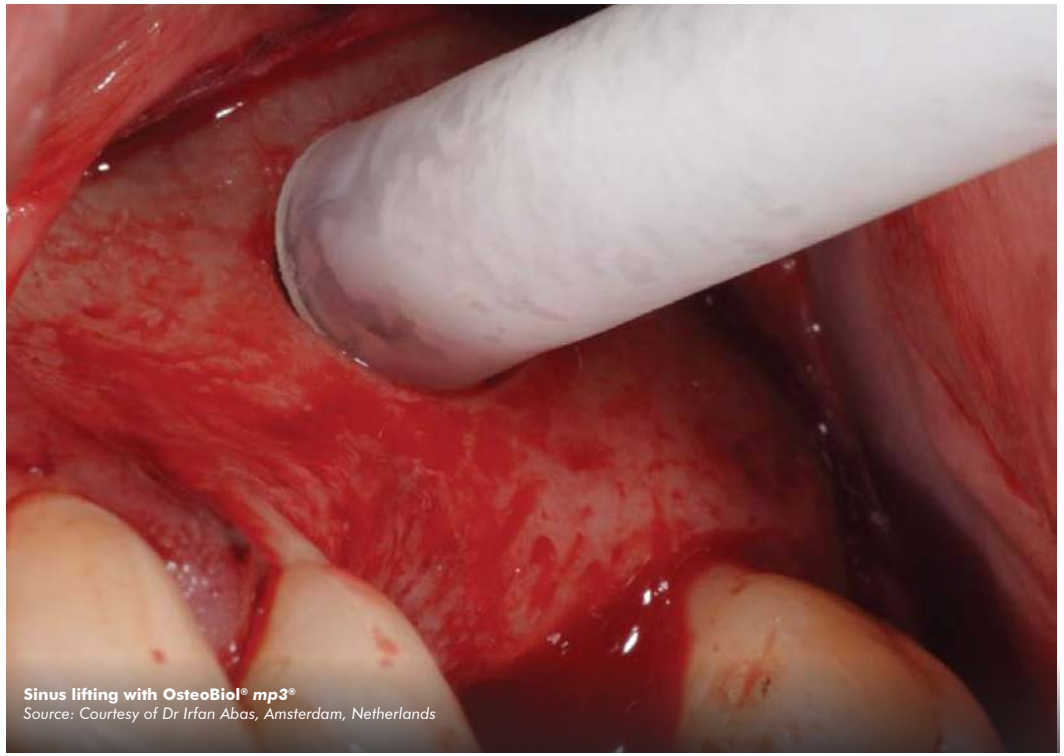
Ridge reconstructed with OsteoBiol® *mp3*®
Source: Courtesy of Dr Patrick Palacci, Marseille, France



Horizontal augmentation performed with OsteoBiol® *mp3*®
Source: Courtesy of Dr Rosario Sentineri, Genova, Italy



Maxillary sinus grafted with OsteoBiol® *mp3*®
Source: Courtesy of Prof Antonio Barone and Prof Ugo Covani, Camaiore, Italy



Sinus lifting with OsteoBiol® *mp3*®
Source: Courtesy of Dr Irfan Abas, Amsterdam, Netherlands

mp3®

Ultimate performance and handling

Pre-hydrated collagenated heterologous cortico-cancellous bone mix

Tissue of origin
Cortico-cancellous heterologous bone mix

Tissue collagen
Preserved plus an additional 10% collagen gel

Physical form
Pre-hydrated granules and collagen gel

Composition
90% granulated mix, 10% collagen gel

Granulometry
600-1000 μm
1000-2000 μm

Re-entry time
About 5 months

Packaging
Syringe: 0.5 cc,1.0 cc, 3x0.25 cc, 3x0.5 cc, 3x1.0 cc
Wide tip syringe: 2.0 cc

Product codes
600-1000 μm
A3095FS | 1 Syringe | 0.5 cc | Porcine
A3095FE | 1 Syringe | 0.5 cc | Equine
A3005FS | 1 Syringe | 1.0 cc | Porcine
A3005FE | 1 Syringe | 1.0 cc | Equine
A3075FS | 3 Syringes | 3x0.25 cc | Porcine
A3015FS | 3 Syringes | 3x0.5 cc | Porcine
A3015FE | 3 Syringes | 3x0.5 cc | Equine
A3030FS | 3 Syringes | 3x1.0 cc | Porcine
A3030FE | 3 Syringes | 3x1.0 cc | Equine
A3010FS | 1 Wide tip syringe | 2.0 cc | Porcine
A3010FE | 1 Wide tip syringe | 2.0 cc | Equine
1000-2000 μm
A3210FS | 1 Wide tip syringe | 2.0 cc | Porcine
A3210FE | 1 Wide tip syringe | 2.0 cc | Equine

GMDN code
38746

Characteristics and handling

CHARACTERISTICS

Heterologous origin biomaterial made of 600-1000 μm or 1000-2000 μm pre-hydrated collagenated cortico-cancellous granules, properly mixed with collagen gel. Thus, it is possible both skipping the hydration phase and decreasing the risk of accidental exposure of the material to pathogens during manipulation and grafting phases; furthermore, the syringe is flexible and ideal to simplify grafting in the receiving site.

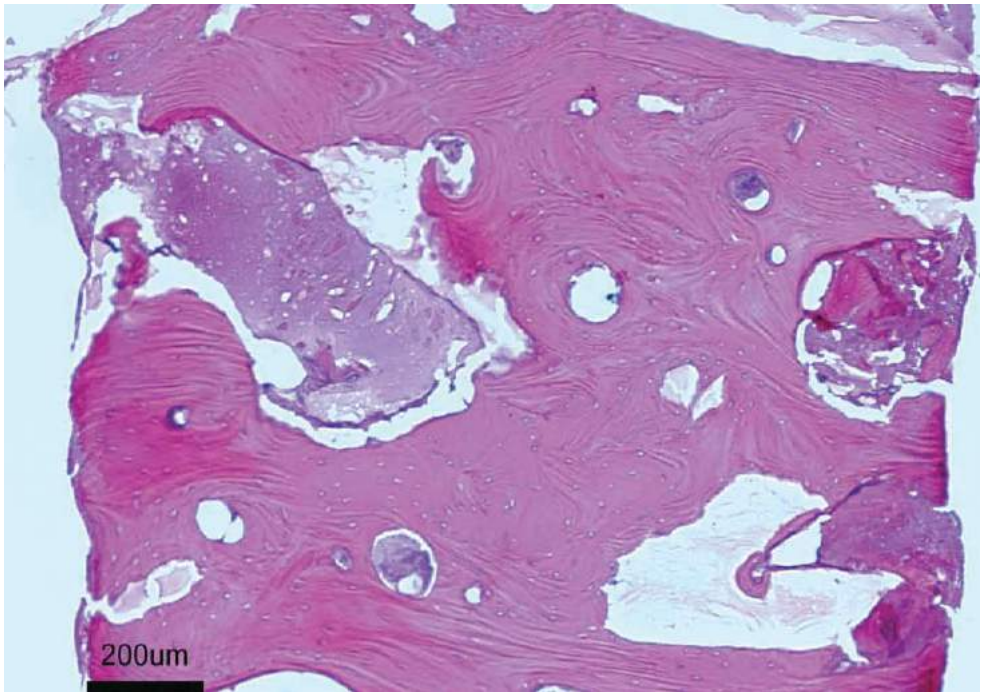
The granules are endowed with characteristics very similar to human mineral bone, and can be used as an alternative to autologous bone.

Their natural micro-porous consistency facilitates new bone tissue formation[1] in defect sites and accelerates the regeneration process.

Gradually resorbable[2,3], it preserves the original graft shape and volume (osteoconductive property)[4,5].
Moreover, thanks to its collagen content, the product facilitates blood clotting and the subsequent invasion of repairing and regenerative cells.

HANDLING

mp3® is available in ready-to-use syringes and can be easily grafted avoiding the hydration and manipulation phases.
After adapting the material to the defect shape, it is necessary to remove non-stable residues before proceeding to soft tissue suture.



Histology on maxillary sinus biopsy taken at 24 months. 48% new bone formation, 13% residual granules
Source: Biopsy by Dr Roberto Rossi, Genova, Italy. Histology by Prof Ulf Nannmark, University of Göteborg, Sweden

Source: Tecnoss® Dental Media Library

Clinical Indications

free animated videos on OsteoBiol® APP

mp3® is a pre-hydrated cortico-cancellous bone mix with 10% collagen gel. It has been developed with this innovative biotechnology and is a "ready-to-use" product.

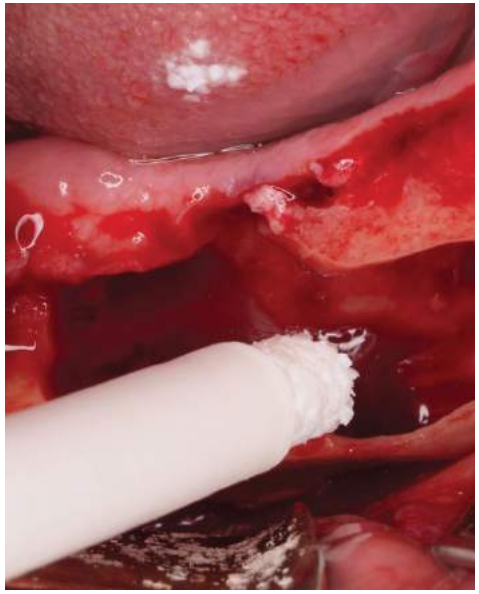
mp3® main indication is lateral access maxillary sinus lift[1,6], always in association with *Evolution* membranes, recommended to cover the antrostomy: the *mp3*® syringe can be directly applied into the bony window without having to mix the *mp3*® granules with saline.

Due to its collagen gel content, *mp3*® allows an excellent graft stability while its hydrophilia guarantees quick blood absorption and therefore the necessary graft vascularization. *mp3*® has also been successfully used in combination with *Evolution* membranes for alveolar ridge preservation[3,7,8]: the application of this biomaterial significantly limits the alveolar ridge width and height reduction that would naturally occur with spontaneous healing, preserving thus the alveolar ridge volume and allowing a correct second stage implant placement.

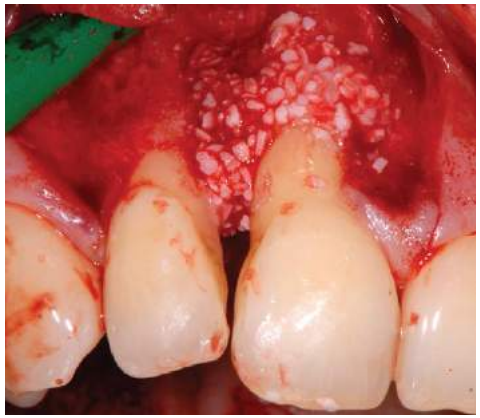
mp3® is also indicated for horizontal augmentation (two wall defects) in combination with autogenous bone blocks or with OsteoBiol® *Lamina*[9,10]: its cortico-cancellous composition allows a progressive resorption of osteoclastic type, and in parallel a similar rate of new bone formation[2].

These unique properties allow a very good graft volume preservation[11], a healthy new bony tissue and ultimately, a successful implant rehabilitation.

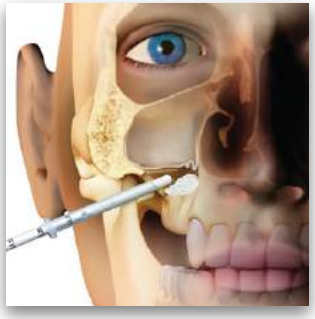
Finally, *mp3*® can also be used as filler of bone defects after trauma, reconstruction or corrections in non-load-bearing indications in maxillofacial surgery.



OsteoBiol® *mp3*® grafted after the removal of a cyst
Source: Courtesy of Dr Antonio Murillo Rodriguez, Ponferrada, Spain

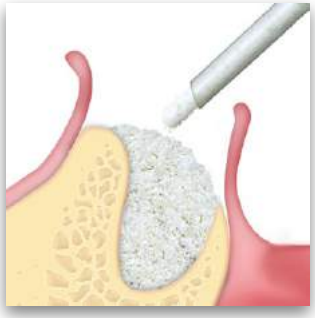


Periodontal defect grafted with OsteoBiol® *mp3*®
Source: Courtesy of Dr Gerd Körner, Bielefeld, Germany



LATERAL ACCESS SINUS LIFT
maxillary sinus floor augmentation
case reports on page 84

ALVEOLAR REGENERATION
post-extractive sockets
case reports on page 77



HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 87

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) RAMIREZ FERNANDEZ MP, CALVO GUIRADO JL, MATÉ SANCHEZ DE VAL JE, DELGADO RUIZ RA, NEGRI B, BARONA DORADO C
ULTRASTRUCTURAL STUDY BY BACKSCATTERED ELECTRON IMAGING AND ELEMENTAL MICROANALYSIS OF BONE-TO-BIOMATERIAL INTERFACE AND MINERAL DEGRADATION OF PORCINE XENOGRAFTS USED IN MAXILLARY SINUS FLOOR ELEVATION
CLIN ORAL IMPLANTS RES, 2013 MAY;24(5):523-30

(2) NANNMARK U, SENNERBY L
THE BONE TISSUE RESPONSES TO PREHYDRATED AND COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS: A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2008 DEC;10(4):264-70

(3) GIULIANI A, IEZZI G, MAZZONI S, PIATTELLI A, PERROTTI V, BARONE A
REGENERATIVE PROPERTIES OF COLLAGENATED PORCINE BONE GRAFTS IN HUMAN MAXILLA: DEMONSTRATIVE STUDY OF THE KINETICS BY SYNCHROTRON RADIATION MICROTOMOGRAPHY AND LIGHT MICROSCOPY
CLIN ORAL INVESTIG, 2017 2018 JAN;22(1):505-513

(4) SCARANO A, LORUSSO F, RAVERA L, MORTELLARO C, PIATTELLI A
BONE REGENERATION IN ILIAC CRESTAL DEFECTS: AN EXPERIMENTAL STUDY ON SHEEP
BIOMED RES INT, 2016;2016:4086870

(5) IEZZI G, PIATTELLI A, GIULIANI A, MANGANO C, BARONE A, MANZON L, DEGIDI M, SCARANO A, FILIPPONE A, PERROTTI V
MOLECULAR, CELLULAR AND PHARMACEUTICAL ASPECTS OF FILLING BIOMATERIALS DURING MAXILLARY SINUS-LIFT PROCEDCURES. PART 2: DETAILED CHARACTERISTICS OF THE MATERIALS
CURR PHARM BIOTECHNOL, 2017, 18, 33-44

(6) SILVESTRI M, MARTEGANI P, D'AVENIA F, FARNETI M, CAPRI D, PAOLANTONI G, LANDI L
SIMULTANEOUS SINUS AUGMENTATION WITH IMPLANT PLACEMENT: HISTOMORPHOMETRIC COMPARISON OF TWO DIFFERENT GRAFTING MATERIALS. A MULTICENTER DOUBLE-BLIND PROSPECTIVE RANDOMIZED CONTROLLED CLINICAL TRIAL
INT J ORAL MAXILLOFAC IMPLANTS, 2013 MAR-APR;28(2):543-9

(7) BARONE A, BORGIA V, COVANI U, RICCI M, PIATTELLI A, IEZZI G
FLAP VERSUS FLAPLESS PROCEDURE FOR RIDGE PRESERVATION IN ALVEOLAR EXTRACTION SOCKETS: A HISTOLOGICAL EVALUATION IN A RANDOMIZED CLINICAL TRIAL
CLIN ORAL IMPLANTS RES, 2015 JUL;26(7):806-13

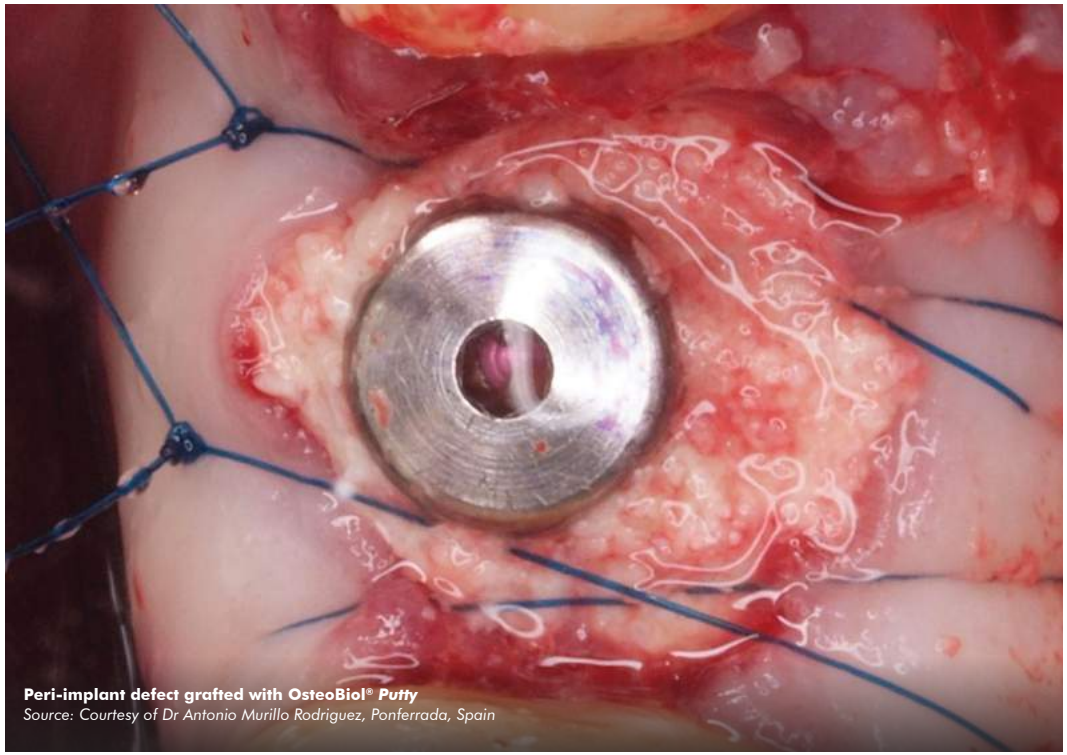
(8) BARONE A, RICCI M, TONELLI P, SANTINI S, COVANI U
TISSUE CHANGES OF EXTRACTION SOCKETS IN HUMANS: A COMPARISON OF SPONTANEOUS HEALING VS. RIDGE PRESERVATION WITH SECONDARY SOFT TISSUE HEALING
CLIN ORAL IMPLANTS RES, 2013 NOV;24(11):1231-7

(9) WACHTEL H, FICKL S, HINZE M, BOLZ W, THALMAIR T
THE BONE LAMINA TECHNIQUE: A NOVEL APPROACH FOR LATERAL RIDGE AUGMENTATION - A CASE SERIES
INT J PERIODONTICS RESTORATIVE DENT, 2013 JUL-AUG;33(4):491-7

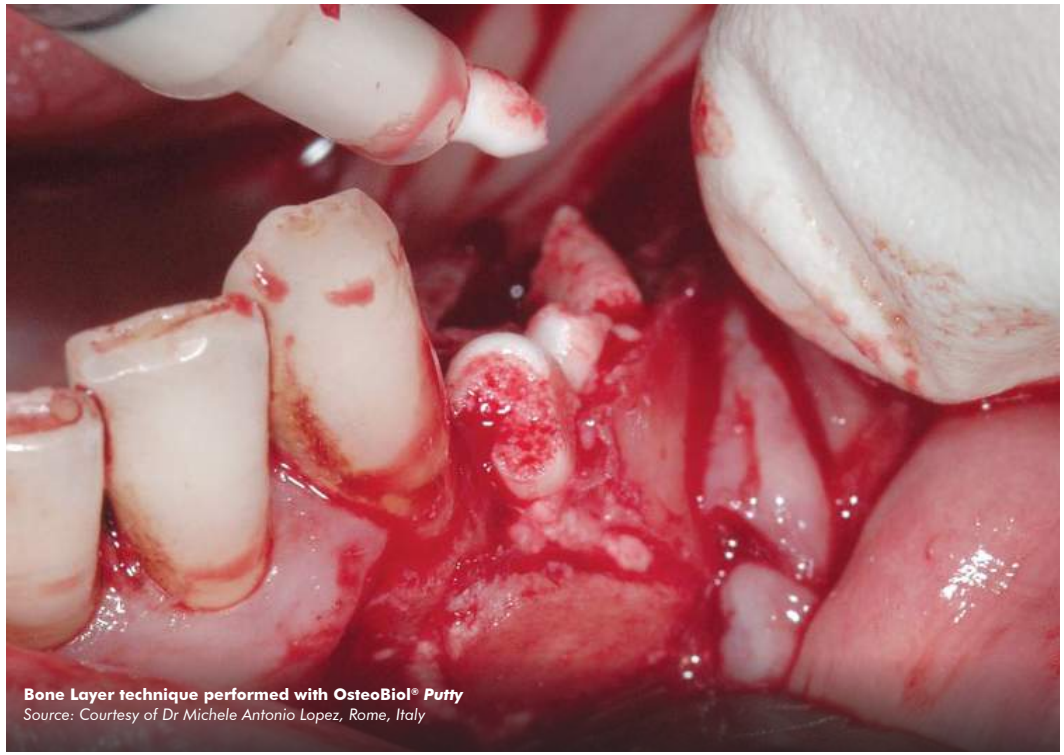
(10) ROSSI R, RANCITELLI D, POLI PP, RASIA DAL POLO M, NANNMARK U, MAIORANA C
THE USE OF A COLLAGENATED PORCINE CORTICAL LAMINA IN THE RECONSTRUCTION OF ALVEOLAR RIDGE DEFECTS. A CLINICAL AND HISTOLOGICAL STUDY
MINERVA STOMATOL, 2016 OCT;65(5):257-68

(11) BARONE A, TOTI P, MENCHINI-FABRIS GB, DERCHI G, MARCONCINI S, COVANI U
EXTRA ORAL DIGITAL SCANNING AND IMAGING SUPERIMPOSITION FOR VOLUME ANALYSIS OF BONE REMODELING AFTER TOOTH EXTRACTION WITH AND WITHOUT 2 TYPES OF PARTICULATE PORCINE MINERAL INSERTION: A RANDOMIZED CONTROLLED TRIAL
CLIN IMPLANT DENT RELAT RES, 2017 AUG;19(4):750-759

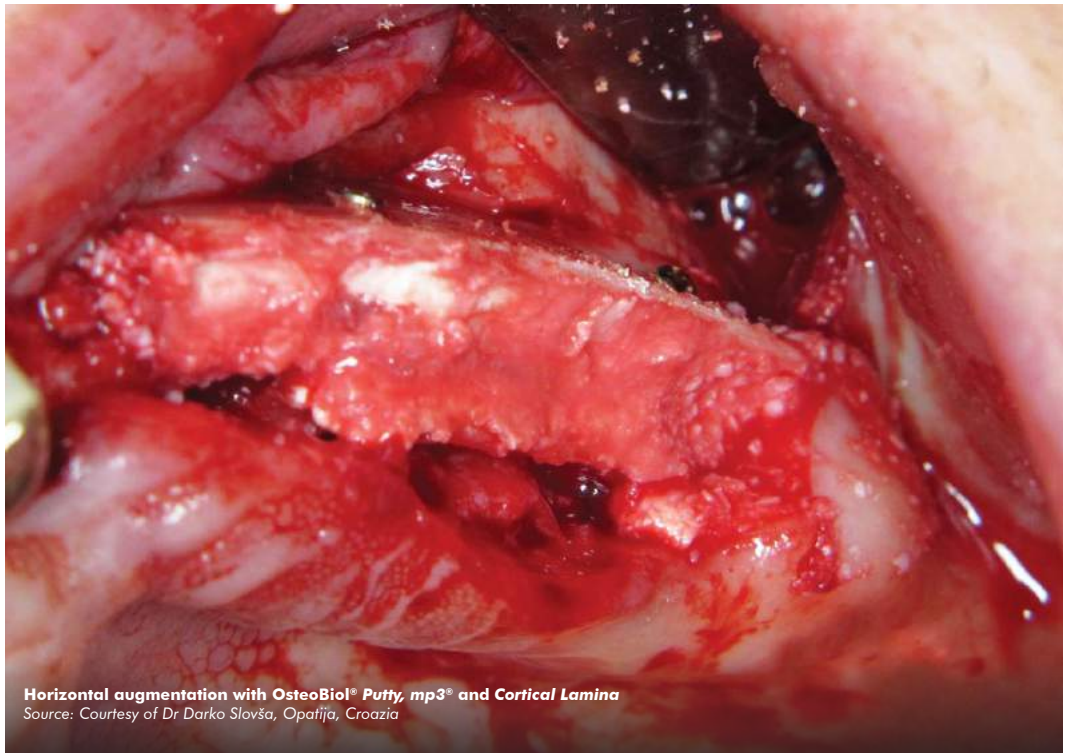
For further information see the complete literature on p. 114



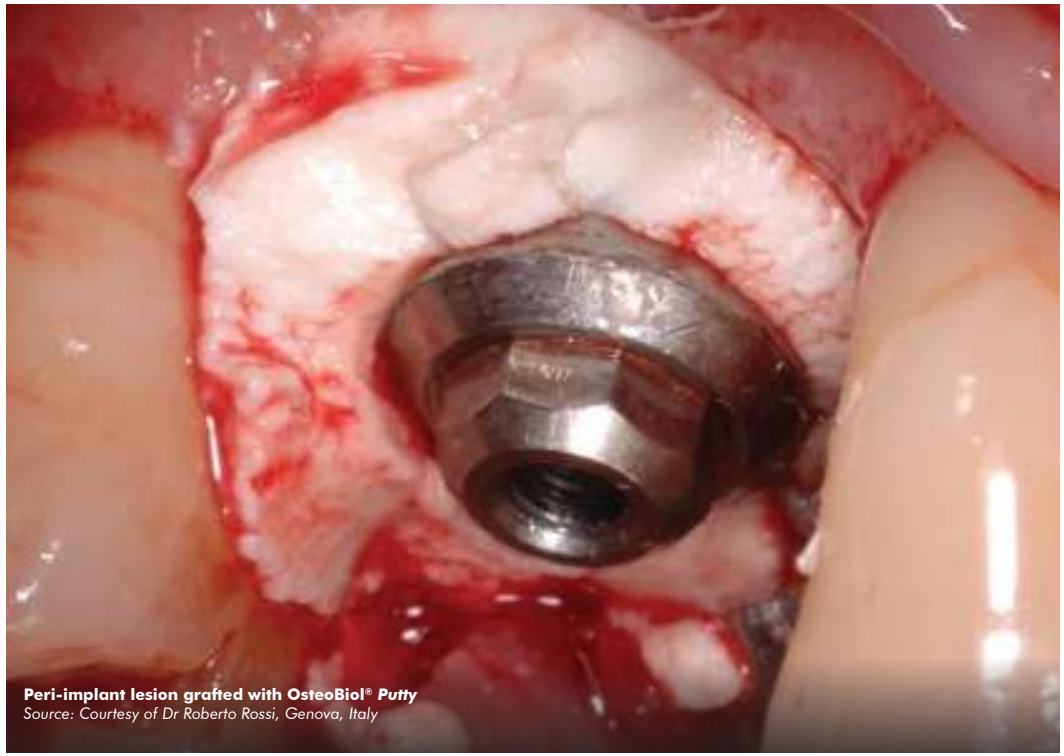
Peri-implant defect grafted with OsteoBiol® *Putty*
Source: Courtesy of Dr Antonio Murillo Rodriguez, Ponferrada, Spain



Bone Layer technique performed with OsteoBiol® *Putty*
Source: Courtesy of Dr Michele Antonio Lopez, Rome, Italy



Horizontal augmentation with OsteoBiol® *Putty, mp3®* and *Cortical Lamina*
Source: Courtesy of Dr Darko Slovša, Opatija, Croazia



Peri-implant lesion grafted with OsteoBiol® *Putty*
Source: Courtesy of Dr Roberto Rossi, Genova, Italy

Putty

Engineered for peri-implant defects

Pre-hydrated collagenated heterologous cortico-cancellous bone paste

Tissue of origin
Cortico-cancellous heterologous bone mix

Tissue collagen
Preserved plus an additional 20% collagen gel

Physical form
Plastic consistency composed of collagen gel loaded with 80% micronized bone mix

Composition
80% granulated mix, 20% collagen gel

Granulometry
Up to 300 μm

Re-entry time
About 4 months

Packaging
Syringe: 0.25 cc, 0.5 cc, 3x0.5 cc, 3x0.25 cc
Wide tip syringe: 1.0 cc

Product codes

HPT52S | 1 Syringe | 0.25 cc | Porcine
HPT09S | 1 Syringe | 0.5 cc | Porcine
HPT09E | 1 Syringe | 0.5 cc | Equine
HPT35S | 3 Syringes | 3x0.5 cc | Porcine
HPT35E | 3 Syringes | 3x0.5 cc | Equine
HPT32S | 3 Syringes | 3x0.25 cc | Porcine
HPT32E | 3 Syringes | 3x0.25 cc | Equine

HPT61S | 1 Wide tip syringe | 1.0 cc | Porcine
HPT61E | 1 Wide tip syringe | 1.0 cc | Equine

GMDN code
38746

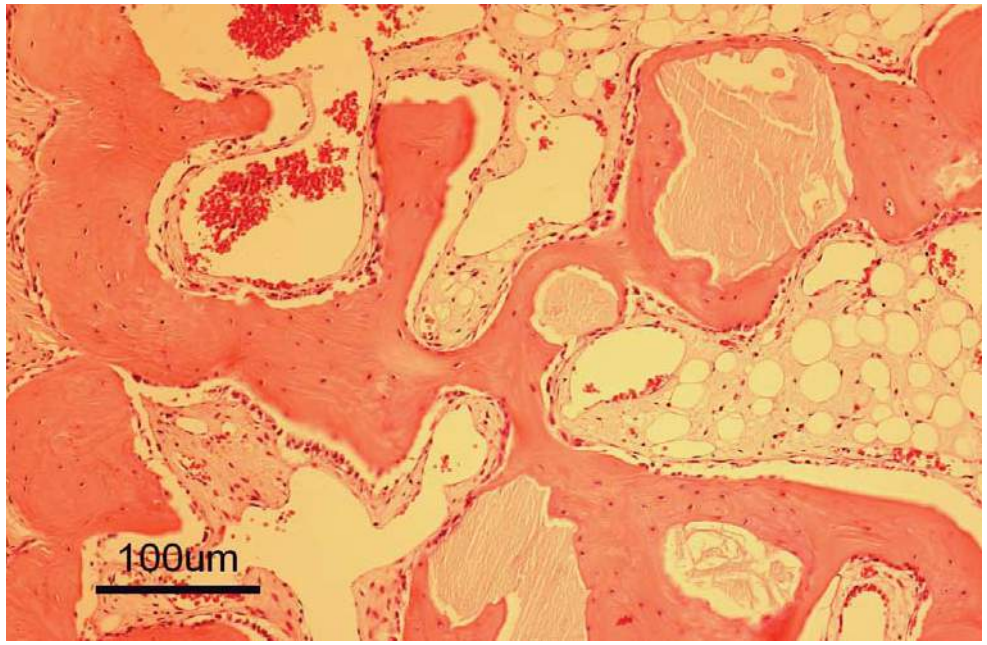
Characteristics and handling

CHARACTERISTICS

Putty is a bone paste with at least 80% micronized heterologous bone (granulometry up to 300 μm) and collagen gel. It is made with an exclusive process that provides the product with exceptional malleability and plasticity, making it easy to apply peri-implant defects with walls. Thanks to its collagen component, the product facilitates blood clotting and the subsequent invasion of repairing and regenerative cells, showing an osteoconductive behaviour[1]. Successful grafting needs complete stability of the biomaterial: for this reason *Putty* must be used only in cavities able to firmly contain it. Therefore, *Putty* must not be grafted in two wall defects or in lateral access sinus lift procedures.

HANDLING

Inject the product and adapt it to defect morphology without compression; any non stable residue must be removed before soft tissue suture. An *Evolution* membrane is recommended to protect *Putty* grafted in peri-implant defects.



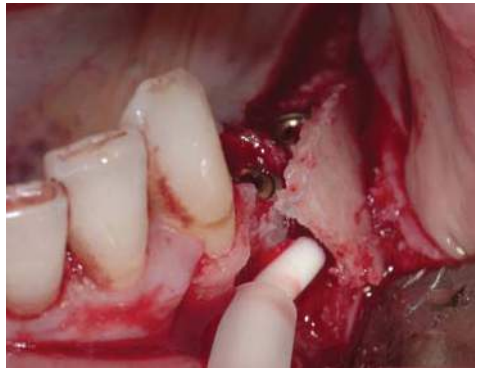
Part of a biopsy showing newly formed bone after treatment with OsteoBiol® *Putty*
Source: Histology by Prof Ulf Nannmark, University of Göteborg, Sweden

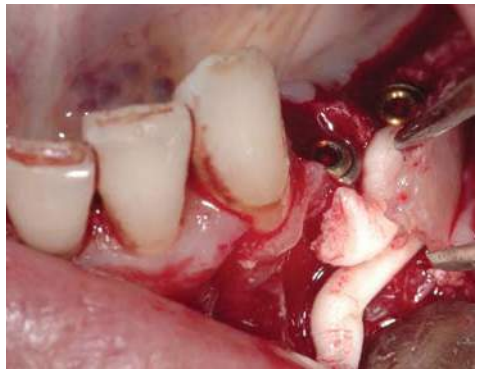
Source: Tecnoss® Dental Media Library

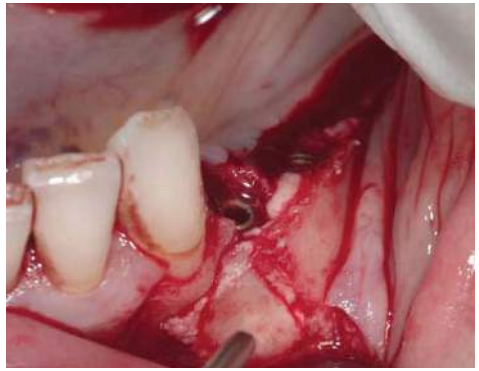
Clinical Indications

The extraordinary handling properties of *Putty* syringe make this product the ideal choice for self-contained peri-implant defects[2] and all small defects that present a self-contained cavity. Furthermore, the Tecnoss® manufacturing process avoids granules ceramization, allowing a progressive resorption of the biomaterial and, at the same time, a significant new-bone formation rate[3]. *Putty*'s "soft" consistency also guarantees an easy and healthy soft-tissues healing. Thanks to these unique characteristics, *Putty* is particularly indicated for peri-implant defects regeneration: following immediate post-extractive implants placement, *Putty* can be injected between the defect walls and the implant, guaranteeing a perfect filling of the entire defect volume[4].

The product versatility also makes *Putty* the ideal solution when bone tissue has been lost due to peri-implantitis as long as the containing walls are present. In fact, the primary condition for gaining a successful regeneration is to achieve the biomaterial initial stability. Therefore, *Putty* must be used only in defects where the surrounding walls guarantee such condition: for example inside the bone crest when ridge-split technique is adopted[5], or with horizontally resorbed crests, in association with OsteoBiol® *Lamina* (Bone Layer technique)[6].
Putty is also an ideal filler after removal of granulomas and dentigenous cysts.







Bone Layer technique with OsteoBiol® *Lamina* and *Putty*
Source: Courtesy of Dr Michele Antonio Lopez, Roma, Italy

DEHISCENCES AND FENESTRATIONS
peri-implant defects
case reports on page 80

HORIZONTAL AUGMENTATION
ridge split
case reports on page 87

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) ARCURI C, CECCHETTI F, GERMANO F, MOTTA A, SANTACROCE C
CLINICAL AND HISTOLOGICAL STUDY OF A XENOGENIC BONE SUBSTITUTE USED AS A FILLER IN POSTEXTRACTIVE ALVEOLUS
MINERVA STOMATOL, 2005 JUN;54(6):351-62

(2) BARONE A, AMERI S, COVANI U
IMMEDIATE POSTEXTRACTION IMPLANTS: TREATMENT OF RESIDUAL PERI-IMPLANT DEFECTS. A RETROSPECTIVE ANALYSIS
EUR J IMPLANT PROSTHODONTICS, 2006,2: 99-106

(3) NANNMARK U, AZARMEHR I
SHORT COMMUNICATION: COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS. A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2010 JUN 1; 12(2):161-3

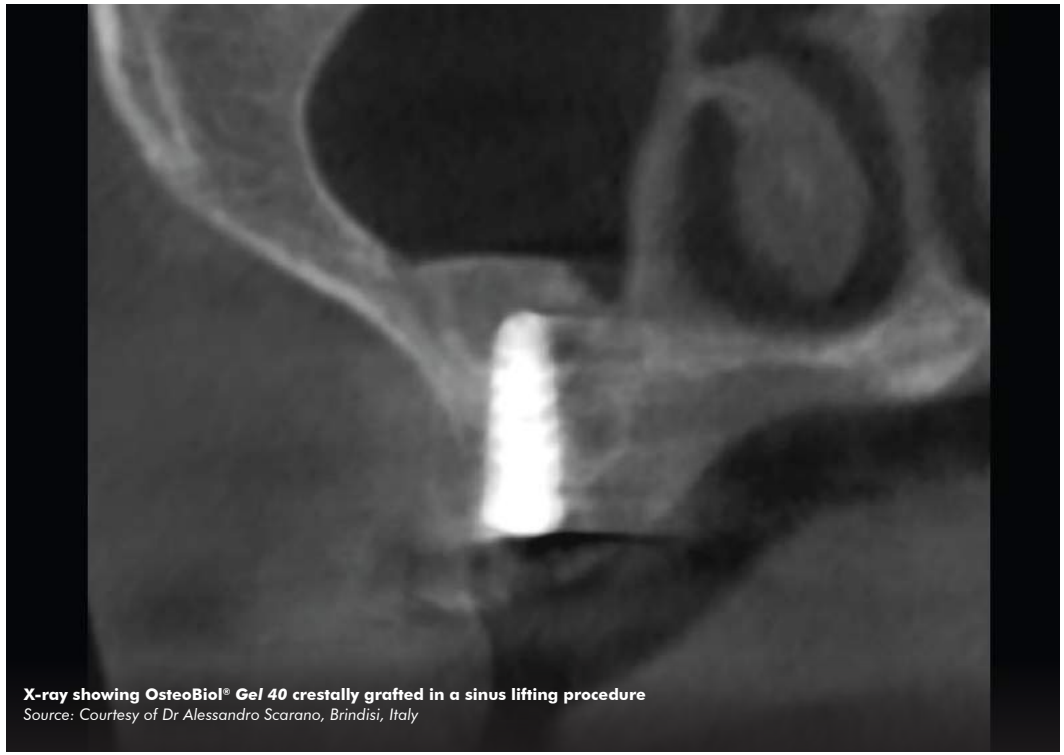
(4) CASSETTA M, RICCI L, IEZZI G, DELL'AQUILA D, PIATTELLI A, PERROTTI V
RESONANCE FREQUENCY ANALYSIS OF IMPLANTS INSERTED WITH A SIMULTANEOUS GRAFTING PROCEDURE: A 5-YEAR FOLLOW-UP STUDY IN MAN
INT J PERIODONTICS RESTORATIVE DENT, 2012 OCT;32(5):581-9

(5) SANTAGATA M, GUARINIELLO L, TARTARO G
A MODIFIED EDENTULOUS EXPANSION (MERE) TECHNIQUE FOR IMMEDIATE PLACEMENT OF IMPLANTS. A CASE REPORT
J ORAL IMPLANTOL, 2011 MAR;37 SPEC N.:114-9

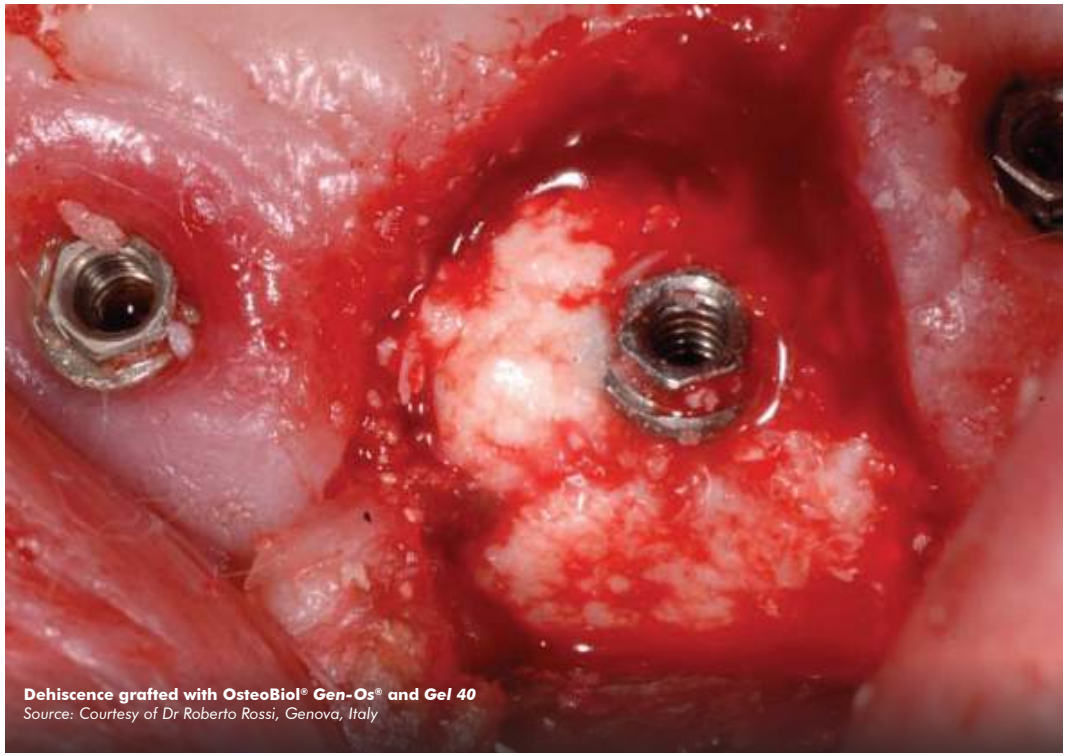
(6) LOPEZ MA, ANDREASI BASSI M, CONFALONE L, CARINCI F, ORMIANER Z, LAURITANO D
THE USE OF RESORBABLE CORTICAL LAMINA AND MICRONIZED COLLAGENATED BONE IN THE REGENERATION OF ATROPHIC CRESTAL RIDGES: A SURGICAL TECHNIQUE. CASE SERIES
J BIOL REGUL HOMEOST AGENTS, 2016 APR-JUN;30(2 SUPPL 1):81-85

For further information see the complete literature on p. 114

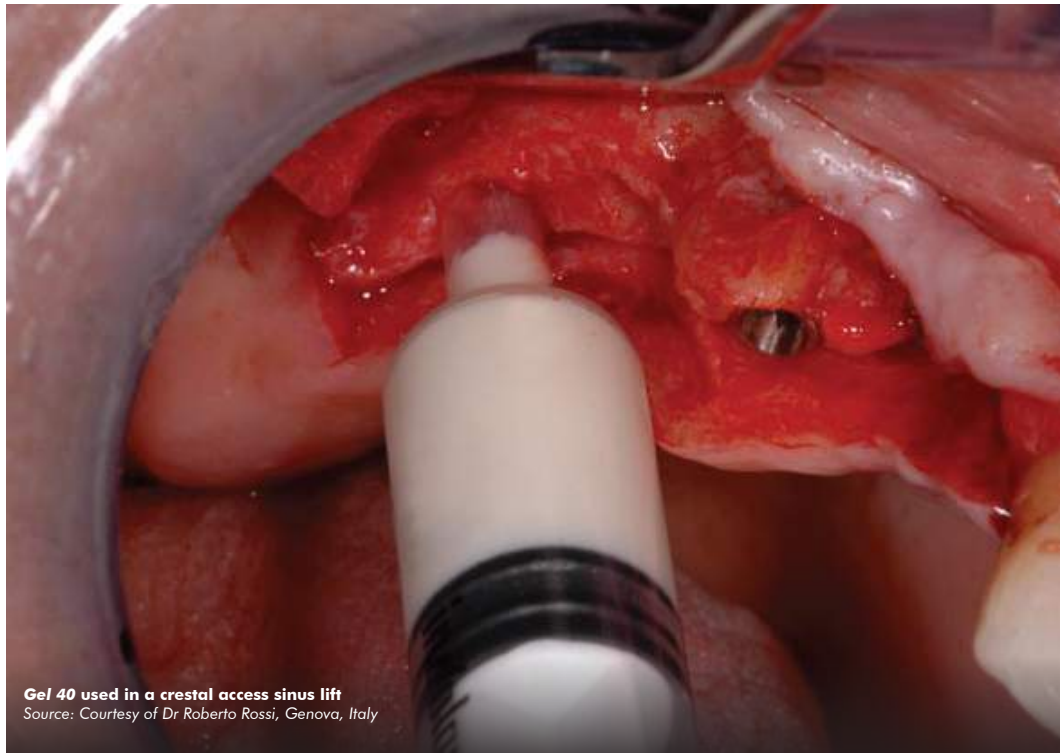
Intrabony defect grafted with OsteoBiol® *Gel 40*
Source: Courtesy of Dr Walter Rao, Pavia, Italy



X-ray showing OsteoBiol® *Gel 40* crestally grafted in a sinus lifting procedure
Source: Courtesy of Dr Alessandro Scarano, Brindisi, Italy



Dehiscence grafted with OsteoBiol® *Gen-Os*® and *Gel 40*
Source: Courtesy of Dr Roberto Rossi, Genova, Italy



***Gel 40* used in a crestal access sinus lift**
Source: Courtesy of Dr Roberto Rossi, Genova, Italy

Gel 40

A unique heterologous bone gel

Collagenated heterologous cortico-cancellous bone mix

Tissue of origin
Cortico-cancellous heterologous bone mix

Tissue collagen
Preserved plus an additional 40% collagen gel

Physical form
Collagen gel type I and III loaded with 60% bone mix

Composition
60% granulated mix, 40% collagen gel

Granulometry
Up to 300 μm

Re-entry time
About 4 months

Packaging
Syringe: 0.5 cc, 3x0.5 cc

Product codes
05GEL40S | 1 Syringe | 0.5 cc | Porcine
05GEL40E | 1 Syringe | 0.5 cc | Equine
15GEL40S | 3 Syringes | 3x0.5 cc | Porcine
15GEL40E | 3 Syringes | 3x0.5 cc | Equine

GMDN code
38746

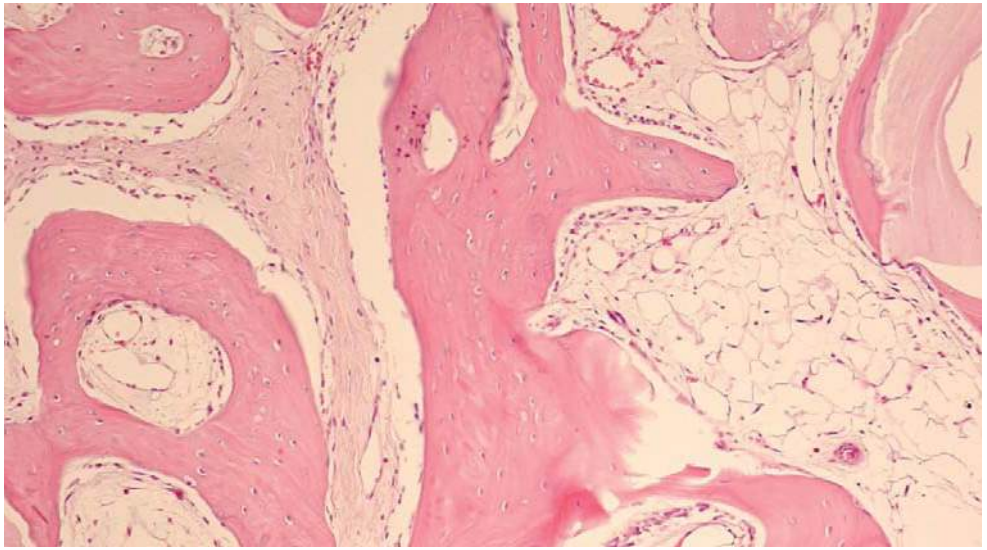
Characteristics and handling

CHARACTERISTICS

Gel 40 is made of a collagen matrix (type I and III) obtained using an exclusive Tecnoss® process, loaded for 60% of its volume with micronized heterologous bone (granulometry up to 300 μm). Thanks to its collagen component, *Gel 40* facilitates the formation of primary blood clot and the subsequent invasion of repairing and regenerative cells; moreover, the cortico-cancellous component provides the necessary scaffold function.
The collagen gel component contained in *Gel 40* is rapidly and totally resorbed; it is also endowed with exceptional anti-inflammatory, eutrophic and cicatrizing properties. This lipophilia is due mainly to a percentage of polyunsaturated fatty acids of the oleic-linoleic series (to which Omega 3 also belongs) directly derived from the raw material. Such components possess a valuable antioxidant action on the free radicals and therefore aid tissue regeneration.

HANDLING

The distinctive characteristics of viscosity and density of *Gel 40* facilitate the handling of the product by the operator, providing a glue-like support. If viscosity is excessive, add a few drops of sterile lukewarm saline and then re-mix thoroughly to obtain the desired density.



Part of a biopsy showing newly formed bone after treatment with OsteoBiol® *Gel 40*. Biopsies were taken 5 weeks after implantation in rabbit maxillae. Htx-eosine. Original magnification x20
Source: Histology by Prof Ulf Nannmark, University of Göteborg, Sweden

Source: Tecnoss® Dental Media Library

Clinical Indications

free animated videos
on OsteoBiol® APP

The exclusive Tecnoss® manufacturing process guarantees an exceptional malleability and plasticity: furthermore, the syringe packaging provides *Gel 40* extraordinary handling properties making this product the ideal choice for crestal access sinus lift[1,2], deep and narrow peri-implant defects[3], three-wall intrabony defects and, in combination with *Evolution* membranes, for treating gingival recessions[4].

Furthermore, the Tecnoss® manufacturing process avoids granules ceramization, allowing a progressive resorption of the biomaterial and, at the same time, a significant new-bone formation rate[5,6].

Gel 40 "soft" consistency also guarantees an easy and healthy soft-tissues healing.

Crestal access sinus lift with OsteoBiol® *Gel 40*
Source: Tecnoss® Dental Media Library

PERIODONTAL REGENERATION
intrabony defects and gingival recessions
case reports on page 92

CRESTAL ACCESS SINUS LIFT
crestal sinus floor augmentation
case reports on page 82

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) BARONE A, CORNELINI R, CIAGLIA R, COVANI U
IMPLANT PLACEMENT IN FRESH EXTRACTION SOCKETS AND SIMULTANEOUS OSTEOTOME SINUS FLOOR ELEVATION: A CASE SERIES
INT J PERIODONTICS RESTORATIVE DENT, 2008 JUN; 28(3):283-9

(2) SANTAGATA M, GUARINIELLO L, RAUSO R, TARTARO G
IMMEDIATE LOADING OF DENTAL IMPLANT AFTER SINUS FLOOR ELEVATION WITH OSTEOTOME TECHNIQUE: A CLINICAL REPORT AND PRELIMINARY RADIOGRAPHIC RESULTS
J ORAL IMPLANTOL, 2010; 36(6):485-489. EPUB 2010 JUN 16

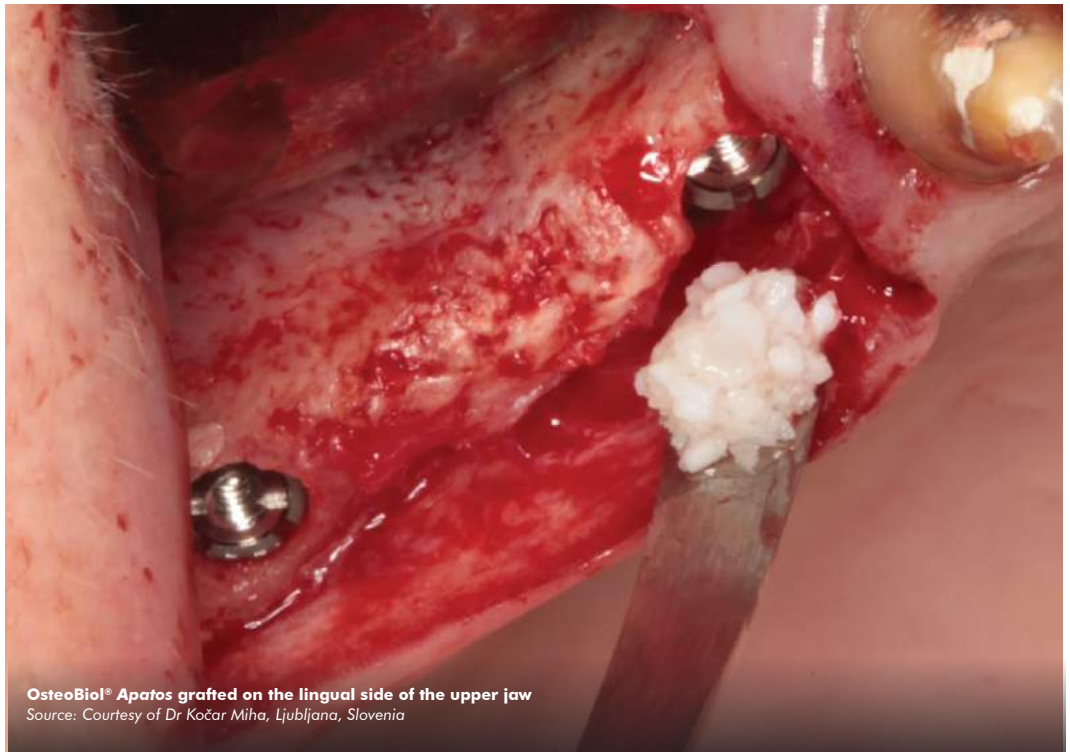
(3) COVANI U, CORNELINI R, BARONE A
BUCCAL BONE AUGMENTATION AROUND IMMEDIATE IMPLANTS WITH AND WITHOUT FLAP ELEVATION: A MODIFIED APPROACH
INT J ORAL MAXILLOFAC IMPLANTS, 2008 SEP-OCT; 23(5):841-6

(4) CARDAROPOLI D, CARDAROPOLI G
HEALING OF GINGIVAL RECESSIONS USING A COLLAGEN MEMBRANE WITH A DEMINERALIZED XENOGRAFT: A RANDOMIZED CONTROLLED CLINICAL TRIAL
INT J PERIODONTICS RESTORATIVE DENT, 2009 FEB; 29(1):59-67

(5) NANNMARK U, AZARMEHR I
SHORT COMMUNICATION: COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS. A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2010 JUN 1; 12(2):161-3

(6) LORENZON G, BUTTARELLO GM, CHESSA G
CASE REPORT: IMPLANT PLACEMENT AND IMMEDIATE LOADING WITH SIMULTANEOUS BONE REGENERATION FOLLOWING JAW ODONTOGENIC CYST ENUCLEATION
DENTISTRY, 2015, 5:2

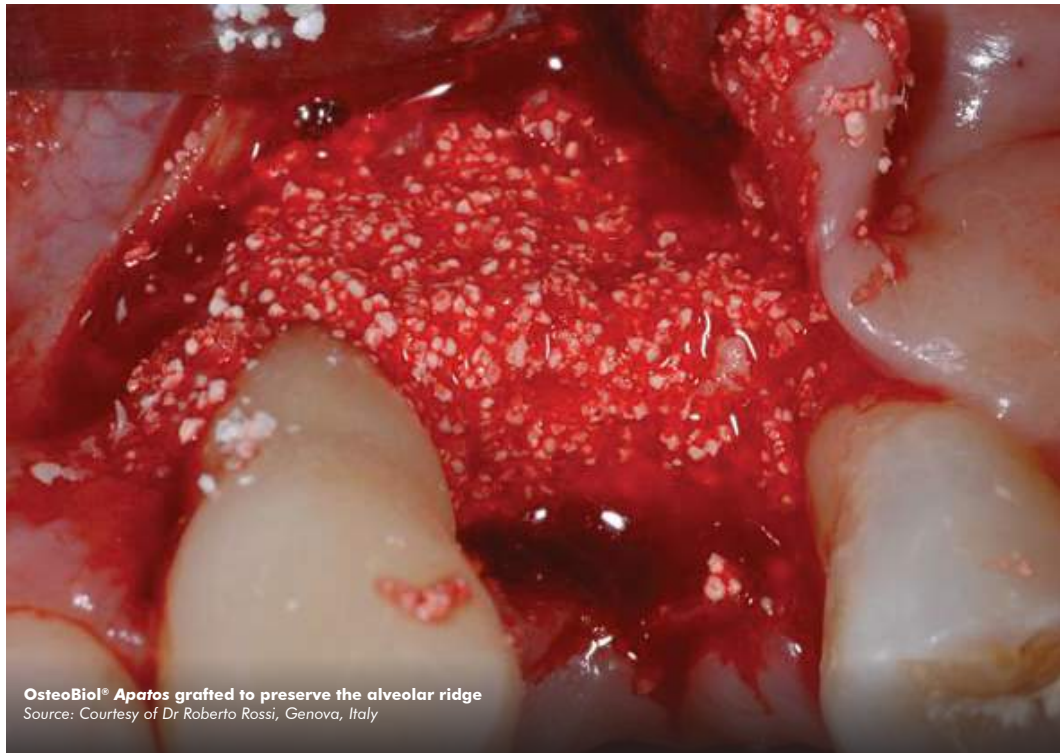
For further information see the complete literature on p. 114



OsteoBiol® *Apatos* grafted on the lingual side of the upper jaw
Source: Courtesy of Dr Kočar Miha, Ljubljana, Slovenia

Horizontal regeneration with OsteoBiol® *Apatos* covered with OsteoBiol® *Derma*
Source: Courtesy of Dr Antonio Murillo Rodriguez, Ponferrada, Spain

Peri-implant defect grafted with OsteoBiol® *Apatos*
Source: Courtesy of Dr Atef Ismail Mohamed, Cairo, Egypt



OsteoBiol® *Apatos* grafted to preserve the alveolar ridge
Source: Courtesy of Dr Roberto Rossi, Genova, Italy

Apatos

Microcrystalline hydroxyapatite

Heterologous cortico-cancellous and cortical bone

Tissue of origin
Apatos Mix: cortico-cancellous heterologous bone mix
Apatos Cortical: heterologous cortical bone

Tissue collagen
Degraded

Physical form
Radiopaque granules of mineral hydroxyapatite

Composition
Apatos Mix: 100% cortico-cancellous mix
Apatos Cortical: 100% cortical bone

Granulometry
600-1000 µm
1000-2000 µm

Re-entry time
About 5 months

Packaging
Mix | Vial: 0.5 g, 1.0 g, 2.0 g
Cortical | Vial: 0.5 g, 1.0 g

Product codes
600-1000 µm
Mix | A1005FS | 1 Vial | 0.5 g | Porcine
Mix | A1005FE | 1 Vial | 0.5 g | Equine
Mix | A1010FS | 1 Vial | 1.0 g | Porcine
Mix | A1010FE | 1 Vial | 1.0 g | Equine
Mix | A1020FS | 1 Vial | 2.0 g | Porcine
Mix | A1020FE | 1 Vial | 2.0 g | Equine
Cortical | AC1005FS | 1 Vial | 0.5 g | Porcine
Cortical | AC1010FS | 1 Vial | 1.0 g | Porcine

1000-2000 µm
Mix | A0210FS | 1 Vial | 1.0 g | Porcine
Mix | A0210FE | 1 Vial | 1.0 g | Equine

GMDN code
38746

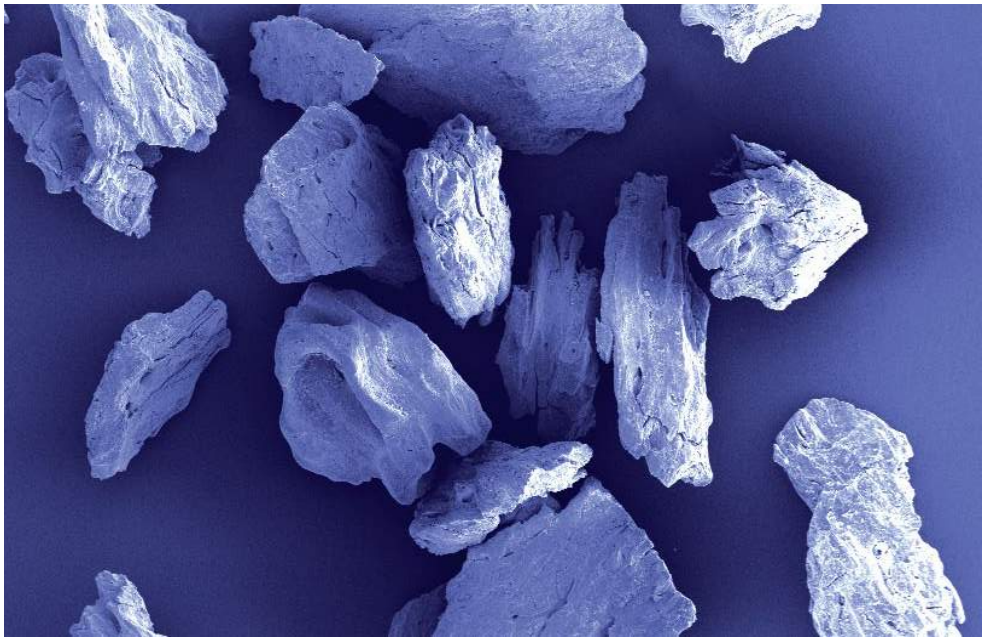
Characteristics and handling

CHARACTERISTICS

Apatos is a biocompatible[1,2], osteoconductive[3,4] biomaterial of heterologous origin with characteristics similar to mineralized human bone[5]; it can therefore be used as an alternative to autologous bone. The natural microporous consistency of *Apatos* facilitates the formation of new bone tissue in bone defect area[6], accelerating the process. *Apatos* microcrystalline hydroxyapatite is available in cortical and mixed granules.

HANDLING

Apatos must always be hydrated and thoroughly mixed with a few drops of sterile saline or with *TSV Gel* to increase graft stability in not self-contained defects; it can also be mixed with patient's blood. Finally it can be mixed if necessary with the drug selected for surgery; the mixture thus obtained should be positioned with a sterile spatula or syringe for biomaterials.



SEM image of OsteoBiol® *Apatos*, cancellous granules
Source: Courtesy of Prof Ulf Nannmark, University of Göteborg, Sweden

Source: Tecnoss® Dental Media Library

Clinical Indications

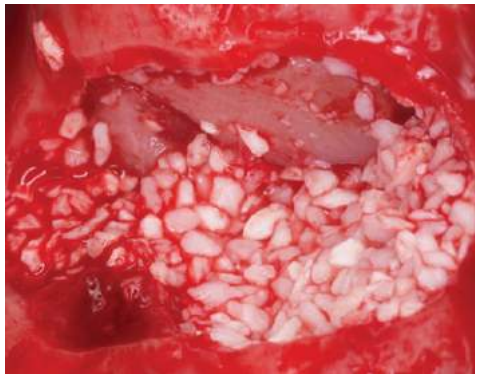
free animated videos
on OsteoBiol® APP

Available on the App Store | Get it on Google play

Apatos is a universal filler, that can be used to treat peri-implant defects and two-wall defects[7,8]. Because of its granulometry, *Apatos* cannot be used in narrow defects, but it fits well in big sockets, e.g. after molar extractions[9]. Both types of sinus lift (with crestal or lateral access)[2,10] can be performed with *Apatos* as bone substitute, as well as surgeries for horizontal regenerations.
Finally, Apatos can be used as filler of large maxillofacial bone defects, reconstruction or corrections in non-load-bearing indications.

Apatos Cortical is characterized by a very long resorption time[11], guaranteeing adequate preservation of the grafted volume.

When needed, *Apatos* grafts can be protected with OsteoBiol® *Evolution* membrane or stabilized with *Cortical Lamina*.

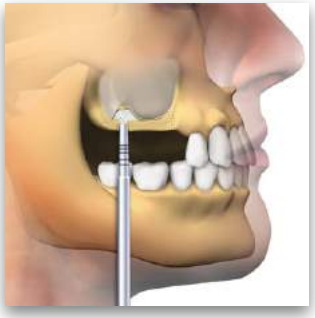


Sinus grafting with OsteoBiol® *Apatos*
Source: Courtesy of Dr. Antonio Murillo Rodriguez, Ponferrada, Spain

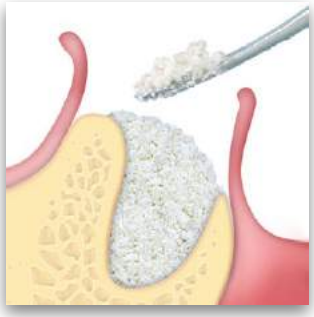
LATERAL ACCESS SINUS LIFT
maxillary sinus floor augmentation
case reports on page 84

DEHISCENCES AND FENESTRATIONS
peri-implant grafting
case reports on page 80

ALVEOLAR REGENERATION
socket preservation
case reports on page 77



CRESTAL ACCESS SINUS LIFT
osteotome sinus floor augmentation
case reports on page 82



HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 87

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) TRUBIANI O, SCARANO A, ORSINI G, DI IORIO D, D'ARCANGELO C, PICCIRILLI M, SIGISMONDO M, CAPUTI S
THE PERFORMANCE OF HUMAN PERIODONTAL LIGAMENT MESENCHYMAL STEM CELLS ON XENOGENIC BIOMATERIALS
INT J IMMUNOPATHOL PHARMACOL, 2007 JAN-MAR; 20(1 SUPPL 1):87-91

(2)ORSINI G, SCARANO A, PIATTELLI M, PICCIRILLI M, CAPUTI S, PIATTELLI A
HISTOLOGIC AND ULTRASTRUCTURAL ANALYSIS OF REGENERATED BONE IN MAXILLARY SINUS AUGMENTATION USING A PORCINE BONE-DERIVED BIOMATERIAL
J PERIODONTOL, 2006 DEC;77(12):1984-90

(3) BRUNELLI G, SOLLAZZO V, CARINCI F, PALMIERI A, GIRARDI A, MONGUZZI R
OSTEOBIOL® INFLUENCES OSTEOGENIC DIFFERENTIATION OF ADIPOSE DERIVED STEM CELLS
EUR J INFLAMM, 2011, VOL. 9, NO. 3(S), 103-107

(4) CAKIR M, KARACA IR, AYSEGÜL F, KAYMAZ F, BOZKAYA S
EXPERIMENTAL EVALUATION OF THE EFFECTS OF ANKAFERD BLOOD STOPPER AND COLLAGENATED HETEROLOGOUS BONE GRAFT ON BONE HEALING IN SINUS FLOOR AUGMENTATION
CLIN ORAL IMPLANTS RES, 2015 MAR-APR;30(2):279-85

(5) KOLMAS J, SZWAJA M, KOLODZIEJSKI W
SOLID-STATE NMR AND IR CHARACTERIZATION OF COMMERCIAL XENOGENEIC BIOMATERIALS USED AS BONE SUBSTITUTES
J PHARM BIOMED ANAL, 2012 MAR 5;61:136-41

(6) BARONE A, TOTI P, QUARANTA A, ALFONSI F, CUCCHI A, NEGRI B, DI FELICE R, MARCHIONNI S, CALVO GUIRADO JL, COVANI U, NANNMARK U
CLINICAL AND HISTOLOGICAL CHANGES AFTER RIDGE PRESERVATION WITH TWO XENOGRAFTS: PRELIMINARY RESULTS FROM A MULTICENTER RANDOMIZED CONTROLLED CLINICAL TRIAL
J CLIN PERIODONTOL, 2017 FEB;44(2):204-214

(7) BARONE A, AMERI S, COVANI U
IMMEDIATE POSTEXTRACTION IMPLANTS: TREATMENT OF RESIDUAL PERI-IMPLANT DEFECTS. A RETROSPECTIVE ANALYSIS
EUR J IMPLANT PROSTHODONTICS, 2006,2: 99-106

(8) BARONE A, TOTI P, QUARANTA A, DERCHI G, COVANI U
THE CLINICAL OUTCOMES OF IMMEDIATE VERSUS DELAYED RESTORATION PROCEDURES ON IMMEDIATE IMPLANTS: A COMPARATIVE COHORT STUDY FOR SINGLE-TOOTH REPLACEMENT
CLIN IMPLANT DENT RELAT RES, 2015 DEC;17(6):1114-26

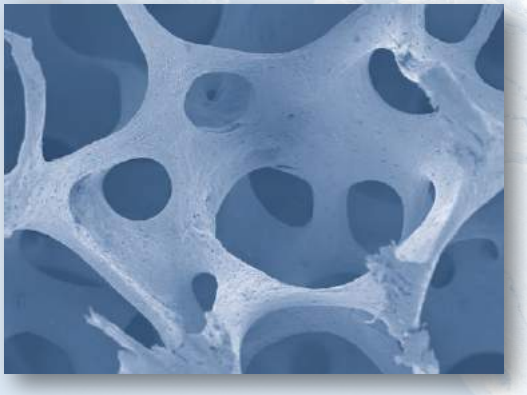
(9) BARONE A, TOTI P, QUARANTA A, ALFONSI F, CUCCHI A, CALVO GUIRADO JL, NEGRI B, DI FELICE R, COVANI U
VOLUMETRIC ANALYSIS OF REMODELLING PATTERN AFTER RIDGE PRESERVATION COMPARING USE OF TWO TYPES OF XENOGRAFTS. A MULTICENTRE RANDOMIZED CLINICAL TRIAL
CLIN IMPLANT DENT RELAT RES, 2015 DEC;17(6):1114-26

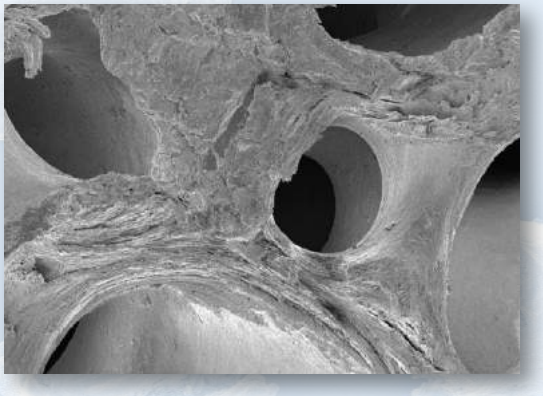
(10) IEZZI G, DEGIDI M, PIATTELLI A, MANGANO C, SCARANO A, SHIBLI JA, PERROTTI V
COMPARATIVE HISTOLOGICAL RESULTS OF DIFFERENT BIOMATERIALS USED IN SINUS AUGMENTATION PROCEDURES: A HUMAN STUDY AT 6 MONTHS
CLIN ORAL IMPLANTS RES, 2012 DEC;23(12)1369-76

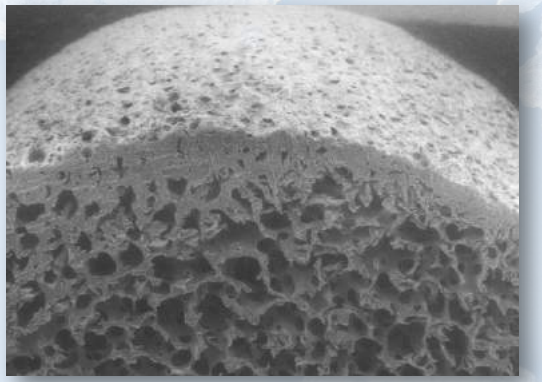
(11) SCARANO A, PIATTELLI A, PERROTTI V, MANZON L, IEZZI G
MAXILLARY SINUS AUGMENTATION IN HUMANS USING CORTICAL PORCINE BONE: A HISTOLOGICAL AND HISTOMORPHOMETRICAL EVALUATION AFTER 4 AND 6 MONTHS
CLIN IMPLANT DENT RELAT RES, 2011 MAR; 13(1):13-18

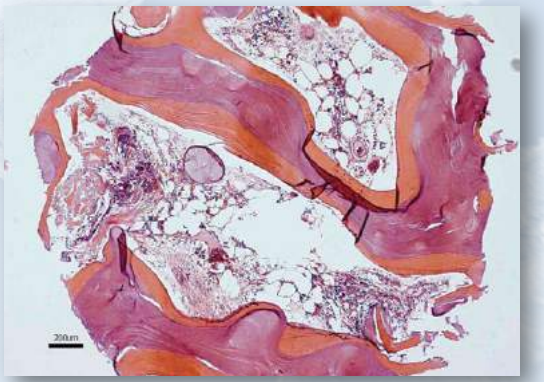
For further information see the complete literature on p. 114

BLOCKS





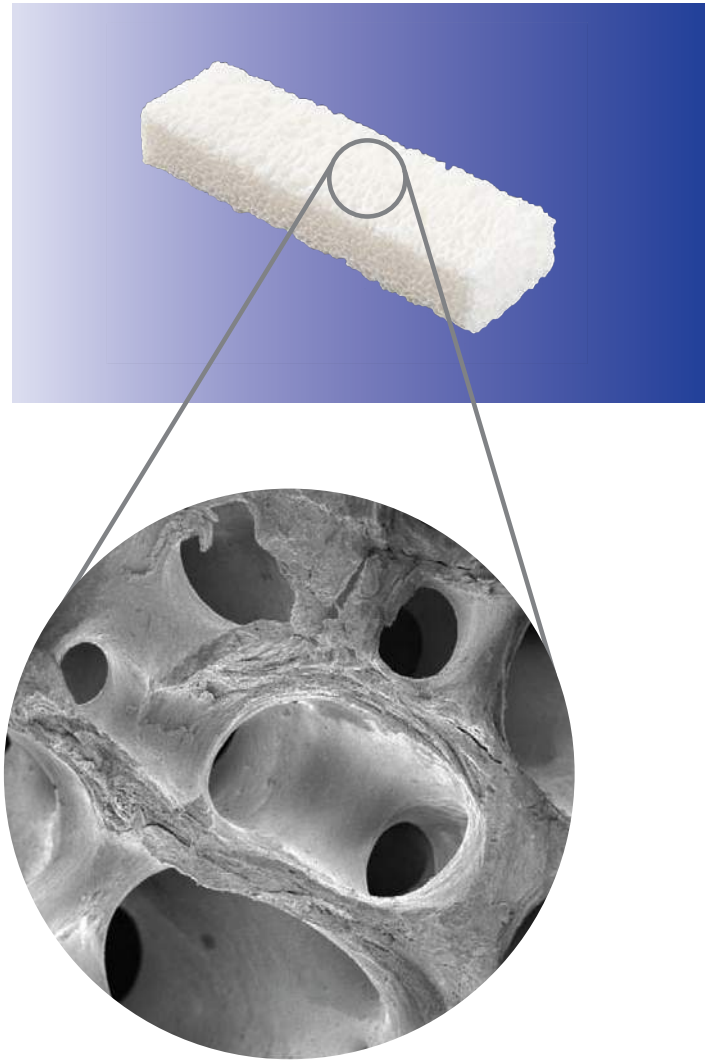





OsteoBiol® bone blocks

Sp-Block

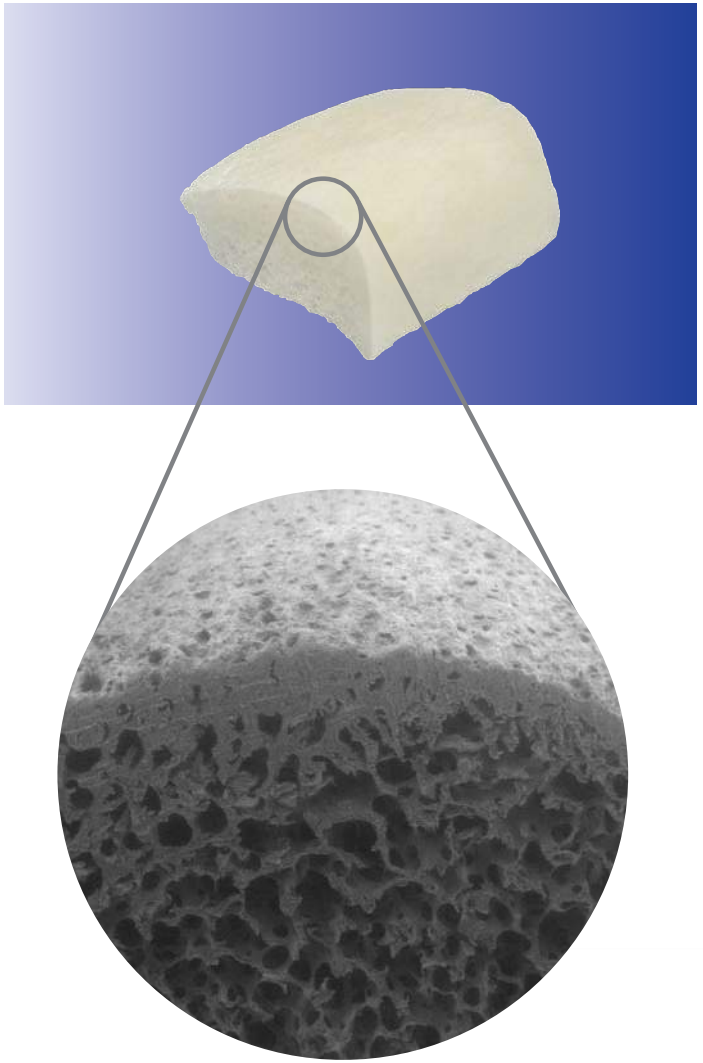
collagenated cancellous bone



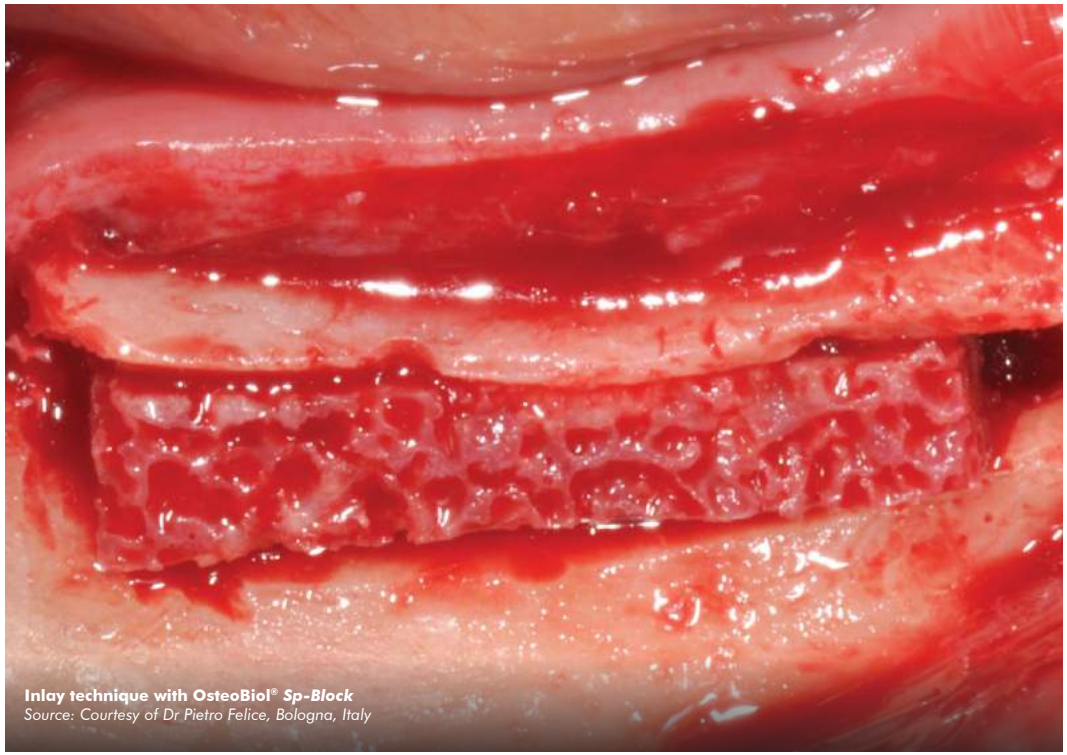
SEM image of OsteoBiol® *Sp-Block*. Magnification 200x.
Source: Politecnico di Torino, Italy
For more information on OsteoBiol® *Sp-Block* see page 50

Dual-Block

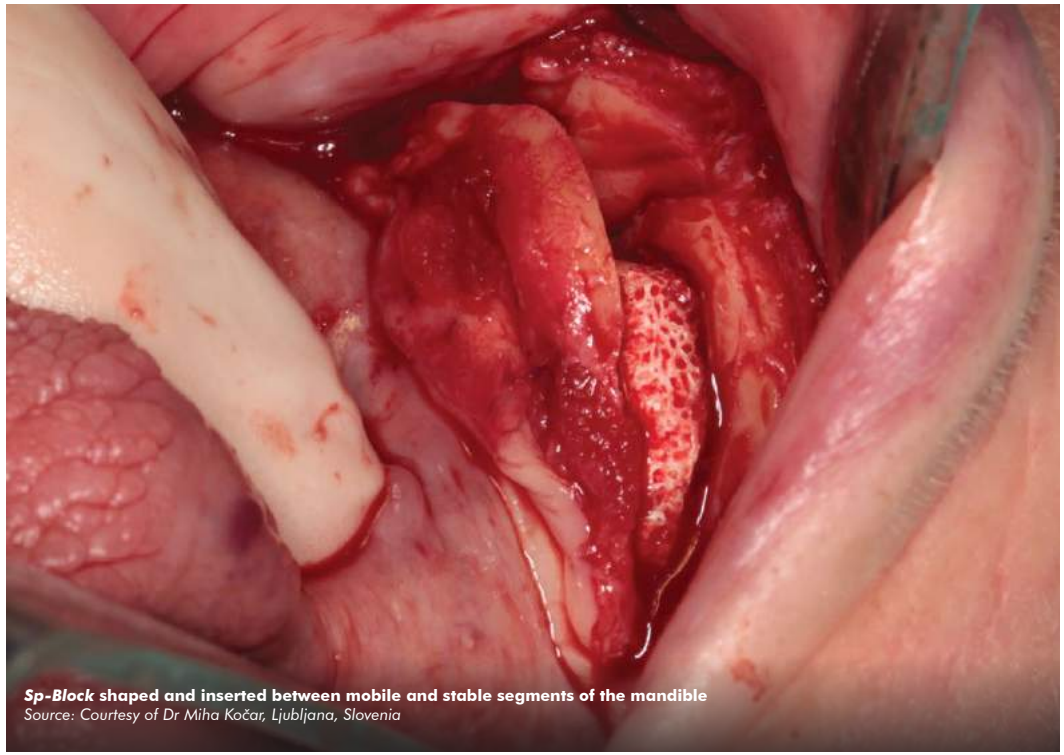
collagenated cortico-cancellous bone



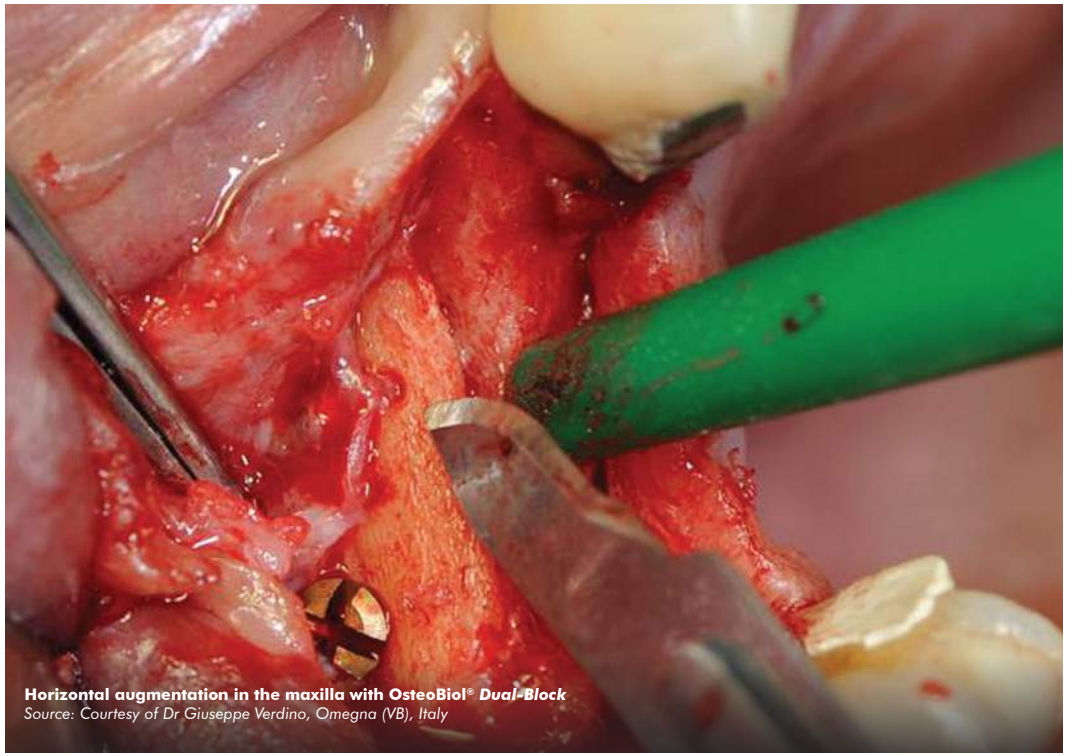
SEM image of OsteoBiol® *Dual-Block*. Magnification 20x.
Source: Politecnico di Torino, Italy
For more information on OsteoBiol® *Dual-Block* see page 50



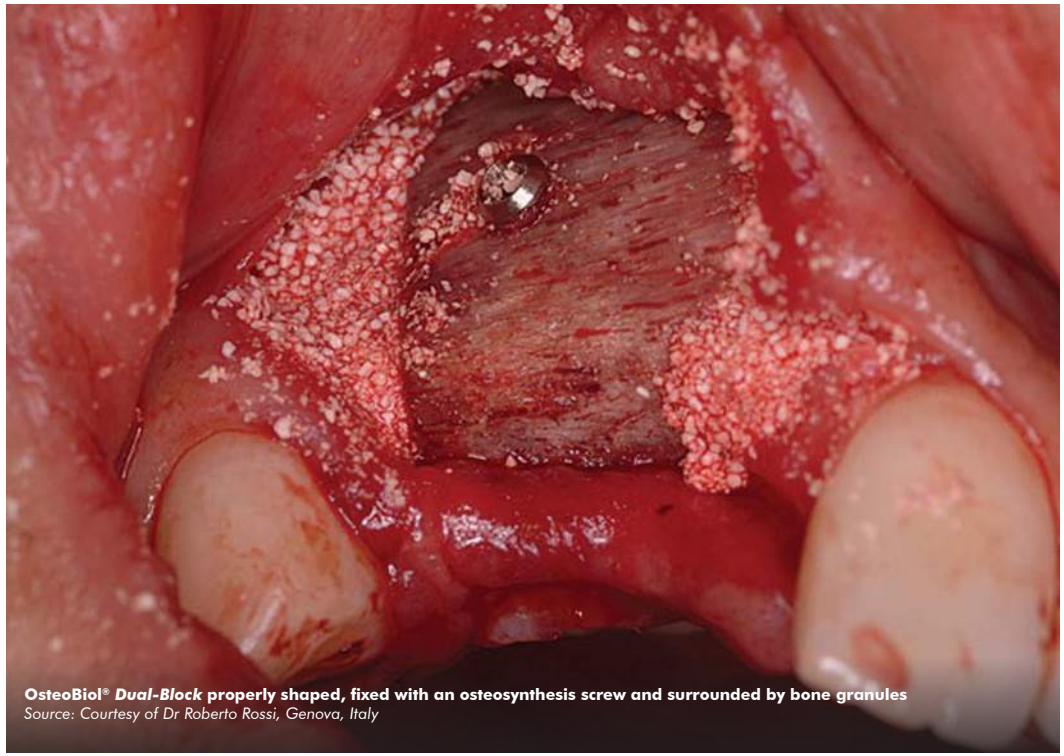
Inlay technique with OsteoBiol® *Sp-Block*
Source: Courtesy of Dr Pietro Felice, Bologna, Italy



***Sp-Block* shaped and inserted between mobile and stable segments of the mandible**
Source: Courtesy of Dr Miha Kočar, Ljubljana, Slovenia



Horizontal augmentation in the maxilla with OsteoBiol® *Dual-Block*
Source: Courtesy of Dr Giuseppe Verdino, Omegna (VB), Italy



OsteoBiol® *Dual-Block* properly shaped, fixed with an osteosynthesis screw and surrounded by bone granules
Source: Courtesy of Dr Roberto Rossi, Genova, Italy

Sp-Block

Cancellous block for the inlay technique in the mandible

Highly osteoconductive properties

Dual-Block

Cortico-cancellous scaffold for horizontal augmentation in the maxilla

Tissue of origin
Cancellous bone

Tissue collagen
Preserved

Physical form
Rigid dried block

Composition
Collagenated cancellous bone

Re-entry time
About 8 months, variable depending on characteristics and irroration grade of grafting site and on clinical conditions of the patient

Packaging
Sterile blister

Product codes
BN0E | 10x10x10 mm | Equine
BN1E | 10x10x20 mm | Equine
BN2E | 10x20x20 mm | Equine
BN8E | 35x10x5 mm | Equine

GMDN code
38746

Characteristics, handling and clinical indications

free animated videos on OsteoBiol® APP

Available on the App Store | Get it on Google play

CHARACTERISTICS

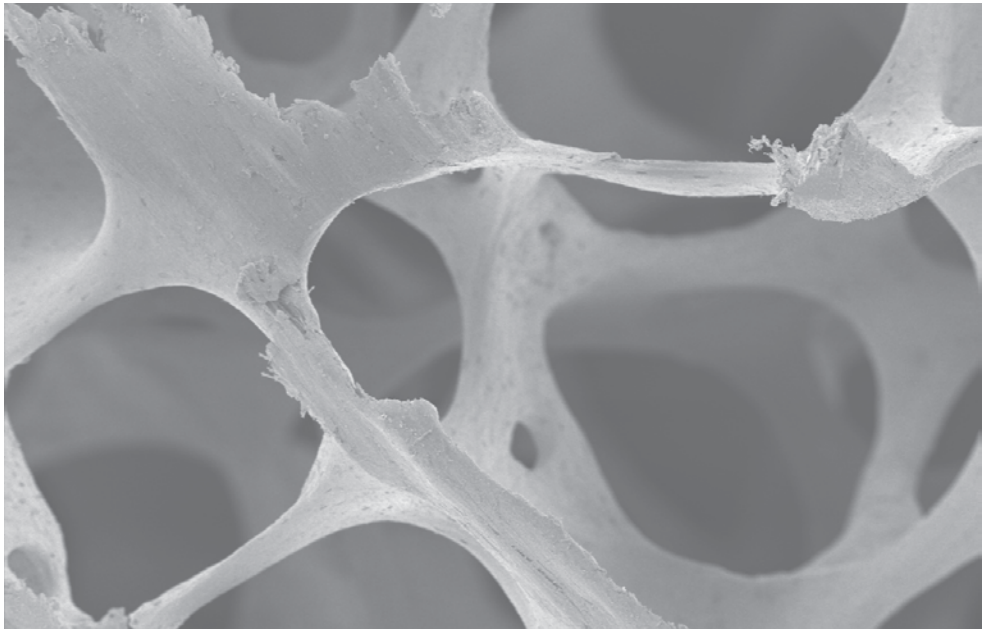
Sp-Block is a cancellous block of xenogenic bone produced with an exclusive Tecnoss® process which avoids ceramization of the hydroxyapatite crystals, thus accelerating physiological resorption. *Sp-Block* supports new bone formation[1,2]: thanks to its rigid consistency it is able to maintain the original graft volume, which is particularly important in case of large regenerations. Moreover, its collagen content facilitates blood clotting and the subsequent invasion of regenerative and repairing cells, favoring the *restitutio ad integrum* of missing bone.

HANDLING

Sp-Block must be hydrated before use for 5/10 minutes with sterile lukewarm physiological solution or with antibiotics. Afterwards, it can be adapted to the receiving site; the block must always be fixed with osteosynthesis microscrews and should be protected with a resorbable membrane (*Evolution*).

CLINICAL INDICATIONS

Sp-Block is indicated in cases where a vertical gain in posterior mandible is required[3-5], to achieve an augmentation of maximum 5 mm, by means of the inlay technique. It is recommended to fill the gaps around the block with a biomaterial in granules, to stabilize the augmented area with mini-plates and screws and to cover it with an *Evolution* membrane.



SEM image of OsteoBiol® cancellous block
Source: Courtesy of Prof Ulf Nannmark, University of Göteborg, Sweden

BIBLIOGRAPHY

(1) SCARANO A, LORUSSO F, RAVERA L, MORTELLARO C, PIATTELLI A
BONE REGENERATION IN ILIAC CRESTAL DEFECTS: AN EXPERIMENTAL STUDY ON SHEEP
BIOMED RES INT, 2016;2016:4086870

(2) FELICE P, PIANA L, CHECCHI L, CORVINO V, NANNMARK U, PIATTELLI M
VERTICAL RIDGE AUGMENTATION OF ATROPHIC POSTERIOR MANDIBLE WITH AN INLAY TECHNIQUE AND CANCELLOUS EQUINE BONE BLOCK: A CASE REPORT
INT J PERIODONTICS RESTORATIVE DENT, 2013 MAR-APR;33(2):159-66

(3) FELICE P, PIANA L, CHECCHI L, PISTILLI R, PELLEGRINO G
VERTICAL RIDGE AUGMENTATION OF THE ATROPHIC POSTERIOR MANDIBLE WITH A 2-STAGE INLAY TECHNIQUE: A CASE REPORT
IMPLANT DENT, 2012 JUN;21(3):190-5

(4) FELICE P, BARAUSSE C, BARONE A, ZUCCHELLI G, PIATTELLI M, PISTILLI R, IPPOLITO DR, SIMION M
INTERPOSITIONAL AUGMENTATION TECHNIQUE IN THE TREATMENT OF POSTERIOR MANDIBULAR ATROPHIES: A RETROSPECTIVE STUDY COMPARING 129 AUTOGENOUS AND HETEROLOGOUS BONE BLOCKS WITH 2 TO 7 YEARS FOLLOW-UP
INT J PERIODONTICS RESTORATIVE DENT, 2017 JUL/AUG;37(4):469-480

(5) BARONE A, TOTI P, MENCHINI FABRIS GB, MARCHIONNI S, COVANI U
EARLY VOLUMETRIC CHANGES AFTER VERTICAL AUGMENTATION OF THE ATROPHIC POSTERIOR MANDIBLE WITH INTERPOSITIONAL BLOCK GRAFT VERSUS ONLAY BONE GRAFT: A RETROSPECTIVE RADIOLOGICAL STUDY
J CRANIO-MAXILLOFAC, 2017 SEP;45(9):1438-1447

VERTICAL AUGMENTATION
inlay technique
case reports on page 90

Additional case reports on osteobiol.com

Characteristics, handling and clinical indications

free animated videos on OsteoBiol® APP

Available on the App Store | Get it on Google play

CHARACTERISTICS

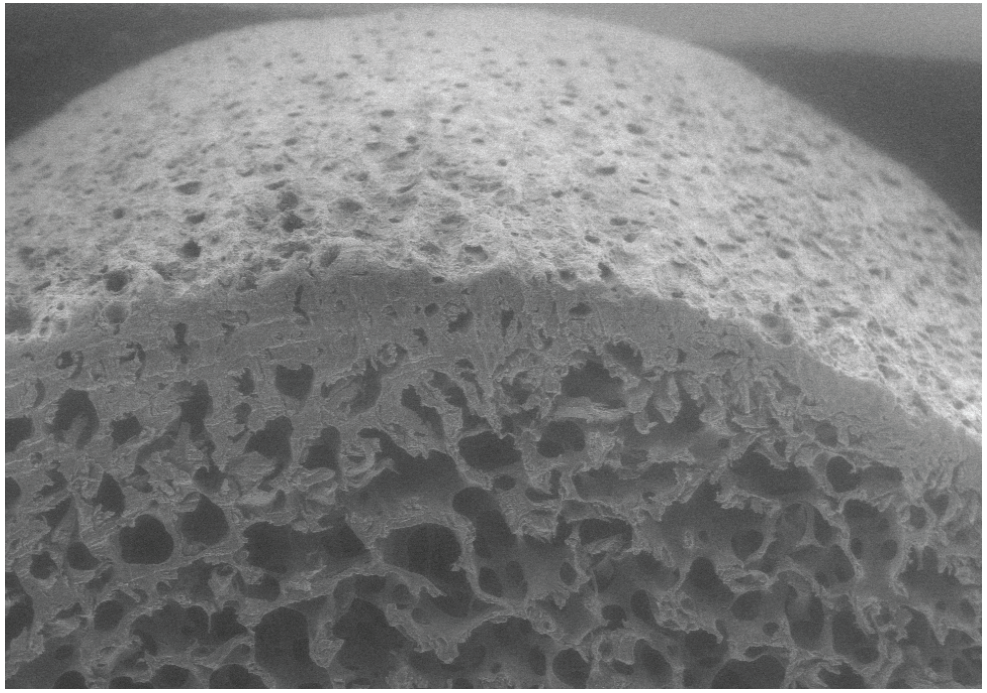
Dual-Block is a cortico-cancellous block of xenogenic bone with osteoconductive characteristics. It can be used when the regeneration of big volumes is needed: thanks to the collagen content that promotes blood clotting and migration of regenerative and repairing cells[1], the graft offers an adequate support for tissue recostruction and is gradually resorbed, while new bone is produced by osteoblasts.

HANDLING

Dual-Block must be hydrated before use with sterile lukewarm physiological solution or with antibiotics (5/10 minutes for Soft version; up to 40 minutes for Norm version). Afterwards, the block can be adapted to the receiving site which must be accurately decorticated in order to guarantee maximum contact; the block should always be fixed with osteosynthesis microscrews and protected with *Evolution* membrane.

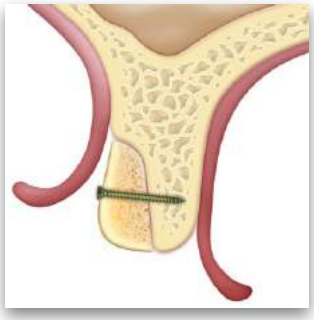
CLINICAL INDICATIONS

Dual-Block can be grafted with the onlay technique only to augment horizontally heavily resorbed maxilla.
It is recommended to fill the gaps around the block with a biomaterial in granules to achieve the desired volume and contour of the augmented recipient site.

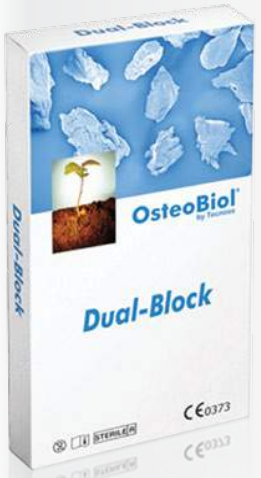


SEM image of OsteoBiol® *Dual-Block*
Source: Politecnico di Torino, Italy

OsteoBiol® *Dual-Block*
Source: Tecnoss® Dental Media Library



HORIZONTAL AUGMENTATION
onlay technique
case reports on page 87



Tissue of origin
Cortico-cancellous bone

Tissue collagen
Preserved

Physical form
Rigid dried block

Composition
Collagenated cortico-cancellous bone

Re-entry time
About 8 months, variable depending on characteristics and irroration grade of grafting site and on clinical conditions of the patient

Packaging
Sterile blister

Product codes
STS7S | 20x15x5 mm | Soft | Porcine curved
STN5S| 20x10x5 mm | Norm | Porcine curved

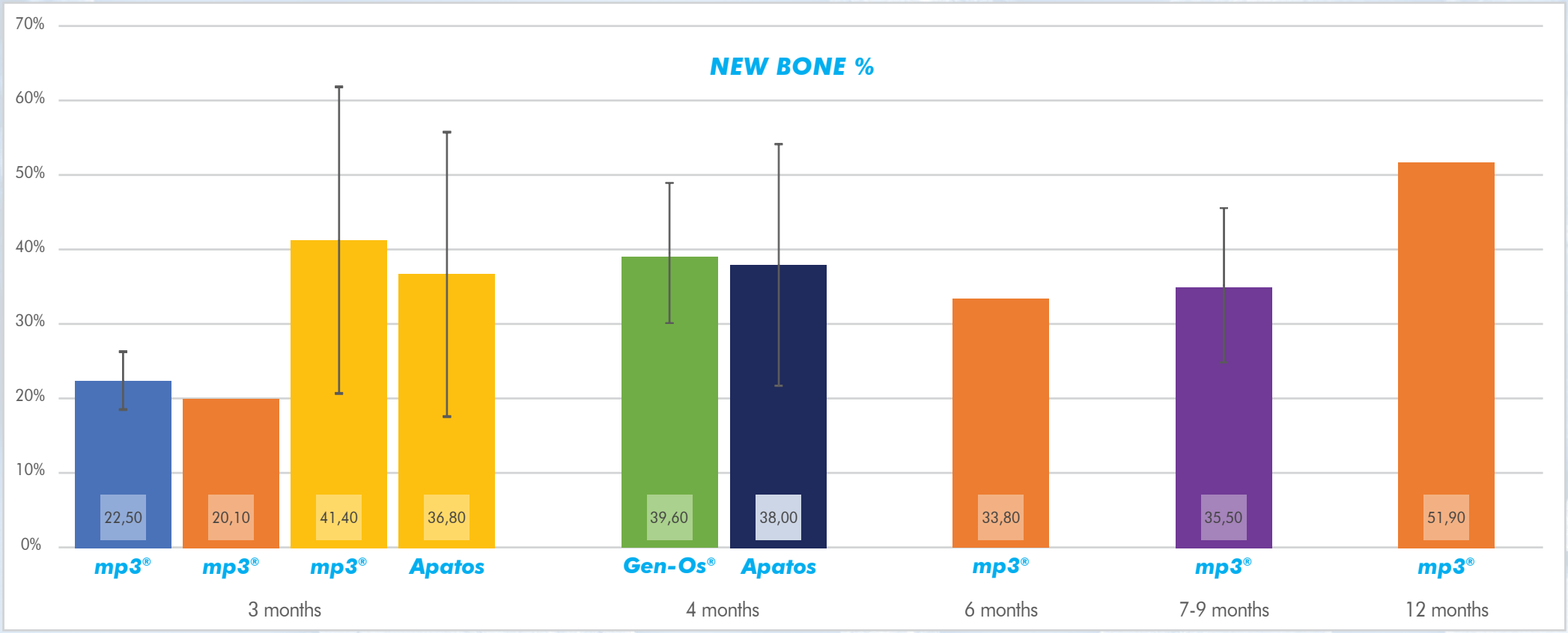
GMDN code
38746

BIBLIOGRAPHY

(1) MANESCU A, GIULIANI A, MOHAMMADI S, TROMBA G, MAZZONI S, DIOMEDE F, ZINI N, PIATTELLI A, TRUBIANI O
OSTEOGENIC POTENTIAL OF DUAL-BLOCKS CULTURED WITH HUMAN PERIODONTAL LIGAMENT STEM CELLS: IN VITRO AND SYNCHROTRON
J PERIODONTAL RES, 2016 Feb;51(1):112-24

Additional case reports on osteobiol.com

Key scientific data: histological results in alveolar regeneration



A) Barone A et al. - **Flap versus flapless procedure for ridge preservation in alveolar extraction sockets: a histological evaluation in a randomized clinical trial**
Clinical Oral Implants Research, 2015 Jul;26(7):806-13

B) Giuliani A et al. - **Regenerative properties of collagenated porcine bone grafts in human maxilla: demonstrative study of the kinetics by synchrotron radiation microtomography and light microscopy**
Clinical Oral Investigations, 2018 Jan;22(1):505-513

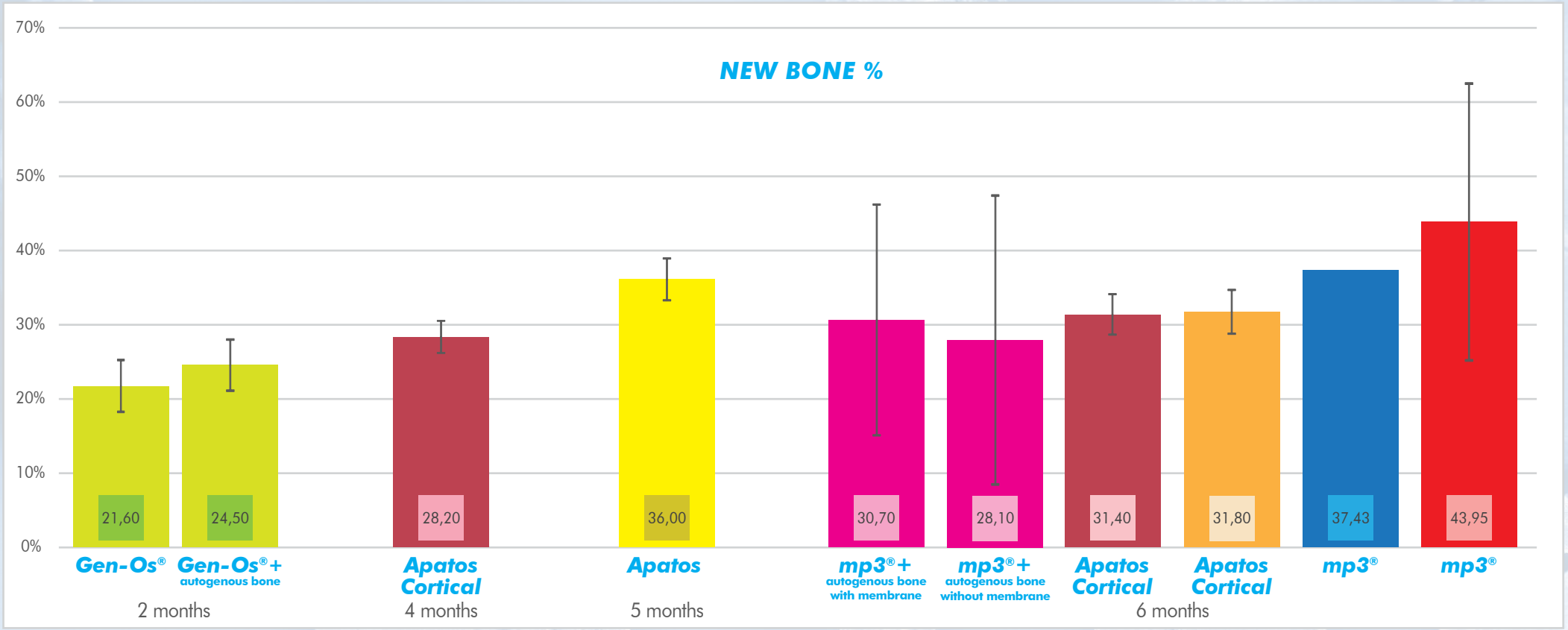
C) Barone A et al. - **Clinical and histological changes after ridge preservation with two xenografts: preliminary results from a multicenter randomized controlled clinical trial**
Journal of Clinical Periodontology, 2017 Feb;44(2):204-214

E) Crespi R et al. - **Corticocancellous porcine bone in the healing of human extraction sockets: combining histomorphometry with osteoblast gene expression profiles in vivo**
Int Journal of Oral and Maxillofacial Implants, 2011 Jul - Aug; 26(4):866-72

F) Crespi R et al. - **Comparison of magnesium-enriched hydroxyapatite and porcine bone in human extraction socket healing: a histologic and histomorphometric evaluation**
Int Journal of Oral and Maxillofacial Implants, 2011 Sep-Oct;26(5):1057-62

G) Barone A et al. - **Xenograft versus extraction alone for ridge preservation after tooth removal: a clinical and histomorphometric study**
Journal of Periodontology, 2008 Aug; 79(8):1370-7

Key scientific data: histological results in sinus lift



A) Cassetta M et al. - **Bone formation in sinus augmentation procedures using autologous bone, porcine bone, and a 50 : 50 mixture: a human clinical and histological evaluation at 2 months**
Clinical Oral Implants Research, 2015 Oct;26(10):1180-4

B) Scarano A et al. - **Maxillary sinus augmentation in humans using cortical porcine bone: a histological and histomorphometrical evaluation after 4 and 6 months**
Clinical Implant Dentistry and Related Research, 2011 Mar; 13(1):13-18

C) Orsini G et al. - **Histologic and ultrastructural analysis of regenerated bone in maxillary sinus augmentation using a porcine bone-derived biomaterial**
Journal of Periodontology, 2006 Dec; 77(12):1984-90

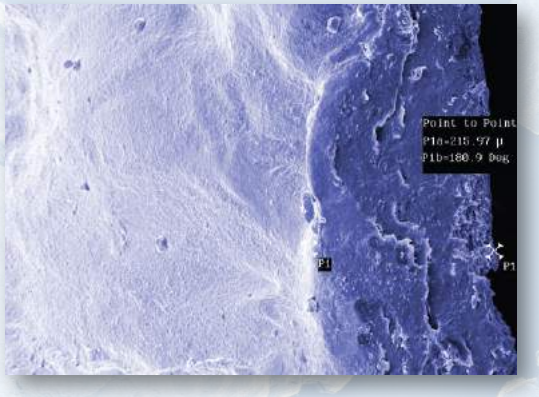
D) Barone A et al. - **A 6-month histological analysis on maxillary sinus augmentation with and without use of collagen membranes over the osteotomy window: randomized clinical trial**
Clinical Oral Implants Research, 2013 Jan; 24(1):1-6

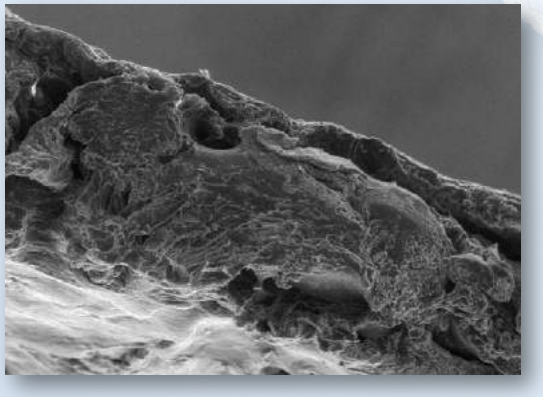
E) Iezzi G et al. - **Comparative histological results of different biomaterials used in sinus augmentation procedures: a human study at 6 months**
Clinical Oral Implants Research, 2012 Dec;23(12):1369-76

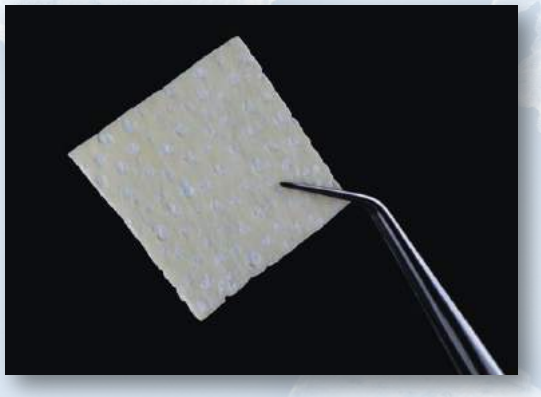
F) Silvestri M et al. - **Simultaneous sinus augmentation with implant placement: histomorphometric comparison of two different grafting materials. A multicenter double-blind prospective randomized controlled clinical trial**
Int Journal of Oral and Maxillofacial Implants, 2013 Mar-Apr; 28(2):543-9

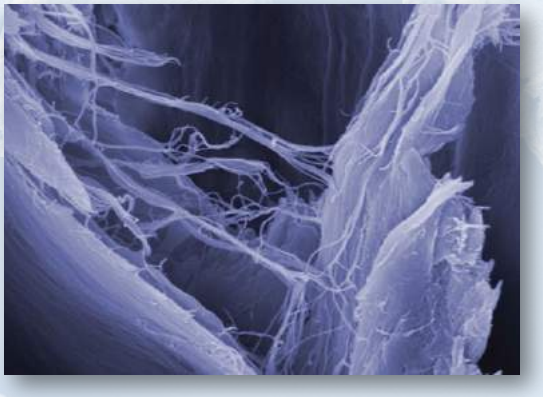
G) Barone A et al. - **Maxillary sinus augmentation using prehydrated corticocancellous porcine bone: hystomorphometric evaluation after 6 months**
Clinical Implant Dentistry and Related Research, 2012 Jun;14(3):373-9

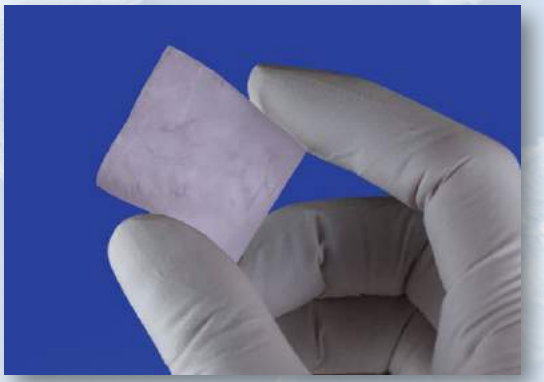
MEMBRANES AND BARRIERS











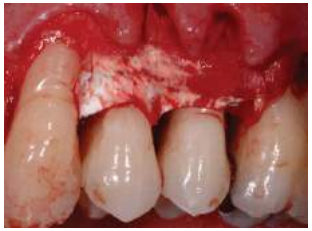
OsteoBiol® membranes and barriers

MEMBRANES

Evolution

Heterologous mesenchymal tissue

Dried membrane with one smooth side and one micro-rough side

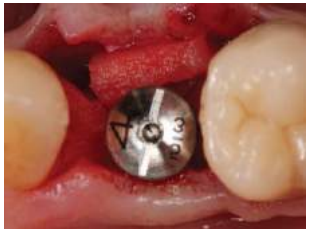


Periodontal defect covered with OsteoBiol® Evolution
Source: Courtesy of Dr Roberto Rossi, Genova, Italy
For more information on OsteoBiol® *Evolution* see page 58

Derma

Porcine derma

Dried membrane

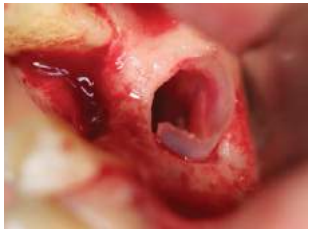


Soft tissue augmentation with OsteoBiol® *Derma*
Source: Courtesy of Dr Stefan Fickl, Würzburg, Germany
For more information on OsteoBiol® *Derma* see page 62

Special

Heterologous pericardium

Translucent dried membrane

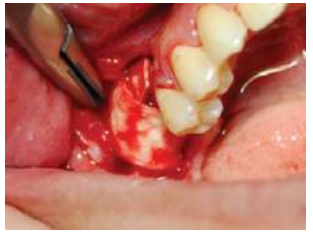


OsteoBiol® *Special* protecting the Schneider membrane before grafting
Source: Courtesy of Dr Donato Frattini, Legnano, Italy
For more information on OsteoBiol® *Special* see page 70

Duo-Teck

Lyophilised equine collagen felt + bone

Dried membrane covered with micronized bone



OsteoBiol® *Duo-Teck* grafted
Source: Courtesy of Dr Atef Ismail Mohamed, Cairo, Egypt
For more information on OsteoBiol® *Duo-Teck* see page 70

BARRIERS

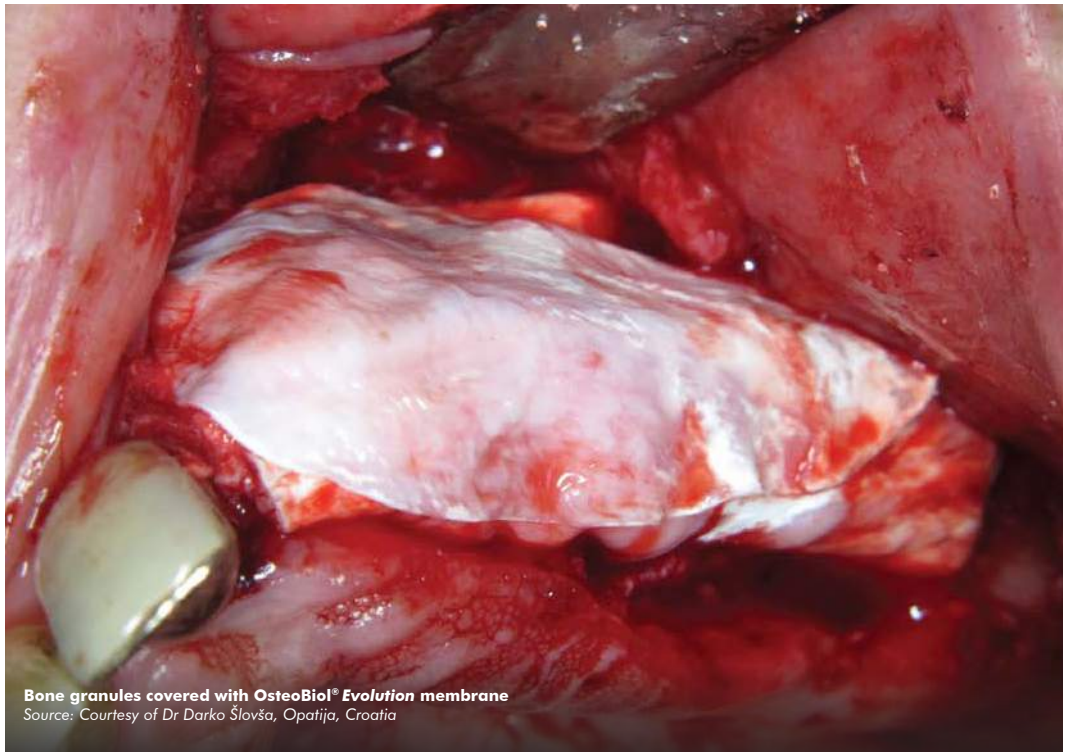
Lamina

Cortical bone

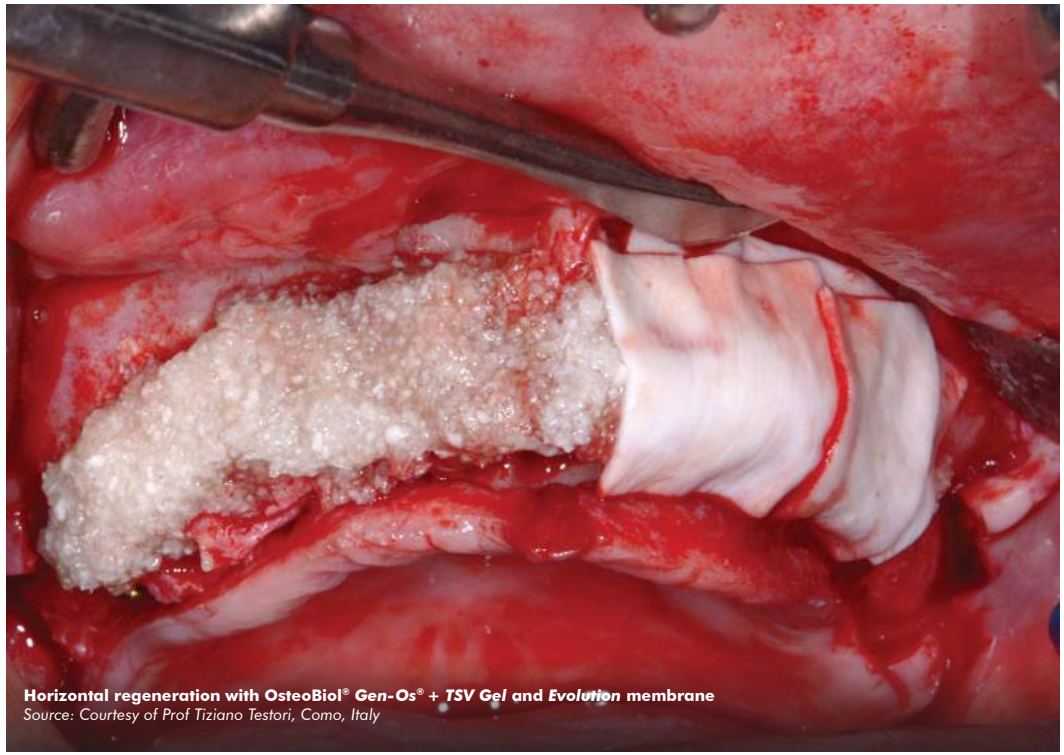
Semi-rigid dried lamina, flexible after re-hydration

OsteoBiol® *Lamina* for the covering of a horizontally augmented area
Source: Courtesy of Prof Dr Hannes Wachtel and Dr Tobias Thalmair, Munich, Germany
For more information on OsteoBiol® *Lamina* see page 66

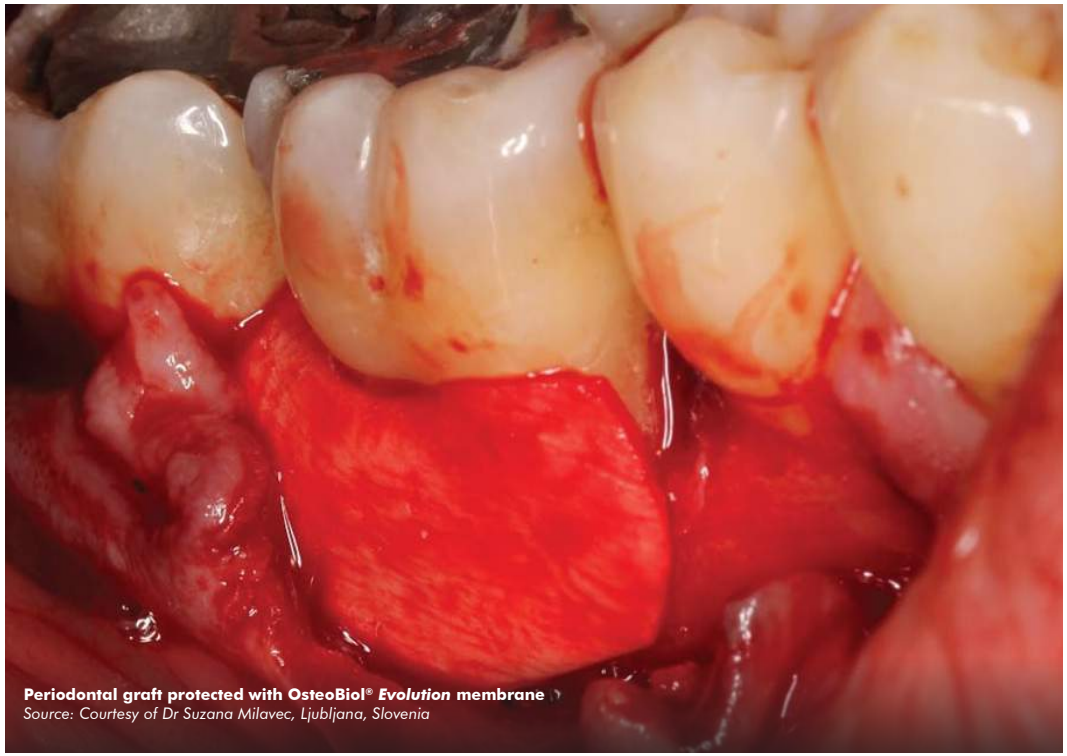
SEM image showing collagenic matrix of OsteoBiol® membranes
Source: Courtesy of Nobil Bio Ricerche, Villafranca d'Asti, Italy



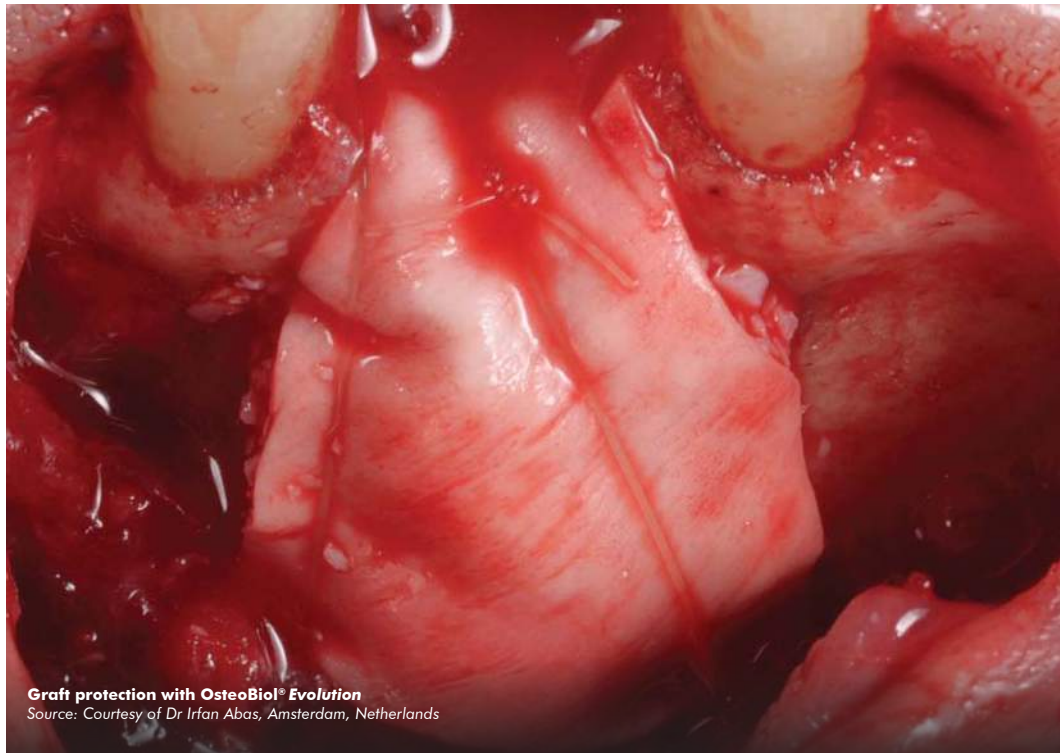
Bone granules covered with OsteoBiol® *Evolution* membrane
Source: Courtesy of Dr Darko Šlovša, Opatija, Croatia



Horizontal regeneration with OsteoBiol® *Gen-Os®* + *TSV Gel* and *Evolution* membrane
Source: Courtesy of Prof Tiziano Testori, Como, Italy

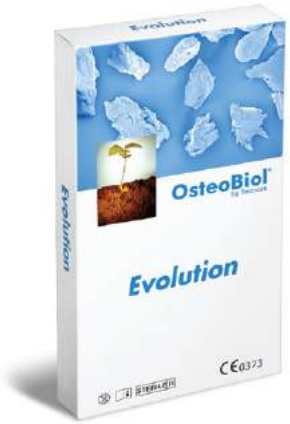


Periodontal graft protected with OsteoBiol® *Evolution* membrane
Source: Courtesy of Dr Suzana Milavec, Ljubljana, Slovenia



Graft protection with OsteoBiol® *Evolution*
Source: Courtesy of Dr Irfan Abas, Amsterdam, Netherlands

Evolution



The natural Evolution of collagen membranes

Heterologous mesenchymal tissue

Tissue of origin
Heterologous mesenchymal tissue

Tissue collagen
Preserved

Physical form
Dried membrane with one smooth side and one micro-rough side

Thickness
X-Fine: 0.2 mm (±0.1 mm)
Fine: 0.3 mm (±0.1 mm)
Standard: 0.5 mm (±0.1 mm)

Estimated resorption time
X-Fine: about 2 months
Fine: about 3 months
Standard: about 4 months

Size
20x20 mm, 30x30 mm, 25x35 mm (oval), 40x40 mm, 80x60 mm

Product codes
EM02XS | 20x20 mm | X-Fine | Porcine
EM03XS | 30x30 mm | X-Fine | Porcine
EV02LLE | 20x20 mm | Fine | Equine
EV03LLE | 30x30 mm | Fine | Equine
EVOLLE | 25x35 mm (oval) | Fine | Equine
EV04LLE | 40x40 mm | Fine | Equine
EV06LLE | 80x60 mm | Fine | Equine
EV02HHE | 20x20 mm | Standard | Equine
EM02HS | 20x20 mm | Standard | Porcine
EV03HHE | 30x30 mm | Standard | Equine
EM03HS | 30x30 mm | Standard | Porcine
EM00HS | 25x35 mm (oval) | Standard | Porcine

GMDN code
38746

Characteristics and handling

CHARACTERISTICS

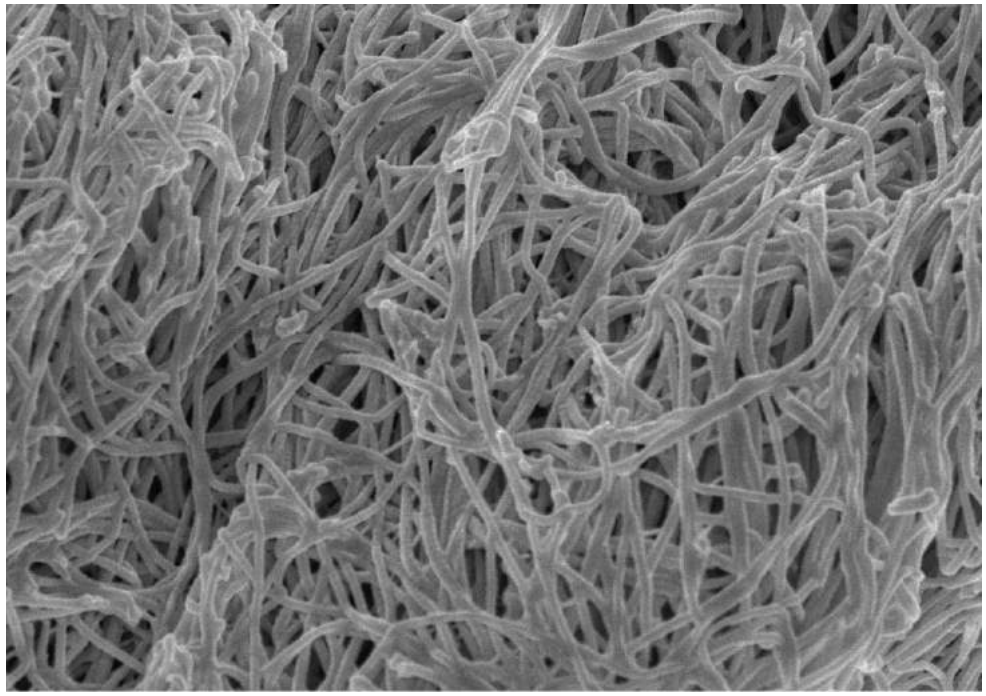
Obtained from heterologous mesenchymal tissue, the *Evolution* membrane is gradually resorbable[1]. Its structure is made of dense collagen fibers of high consistency and of extraordinary resistance that offer the specialist surgeon:

- maximum adaptability to bone tissue and soft tissues
- easy and secure suturability to nearby tissues
- best membrane-bone and membrane-periosteum interface
- stability and prolonged protection of the underlying graft
- clot stabilization and isolation[2]

HANDLING

The membrane can be shaped with sterile scissors until the desired size is reached; unless the grafting site is already bleeding, the membrane should be rehydrated with lukewarm physiological solution. Once it acquires the desired plasticity, it must be adapted to the grafting site.

NB: in case of accidental exposure, the dense collagenic matrix of *Evolution* protects the graft from infection; the membrane itself will also not be infected, allowing second intention healing[3-5].



SEM image of an OsteoBiol® *Evolution standard* membrane
Source: Politecnico di Torino, Italy

Source: Tecnoss® Dental Media Library

Clinical Indications

free animated videos
on OsteoBiol® APP

Available on the App Store | Get it on Google play

Evolution is obtained from heterologous mesenchymal tissue and is completely resorbable. Experimental studies have shown histological evidence of the prolonged barrier effect of this membrane, which lasts at least eight weeks[1], protecting the graft from external agents.

This property is particularly important in case of flapless regeneration[3] of large posterior sockets[5]: in these cases, the standard model is recommended.

In lateral access sinus lift *Evolution* membranes are indicated to cover antrostomy (standard model)[6,7] and to protect the sinus membrane from cutting risk due to graft pressure (fine model)[8].

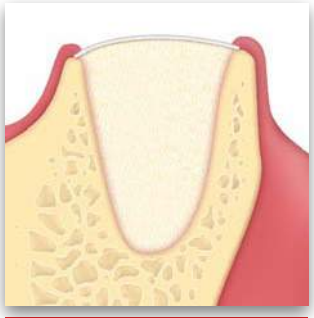
Evolution is also ideal to protect peri-implant regenerations[9] and periodontal grafts. Furthermore, *Evolution* fine has been successfully used for the treatment periodontal defects[10] and to protect *Sp-Block* in vertical augmentation with inlay technique[11].

In oral surgery and traumatology, *Evolution* is always recommended in case of large regeneration with risks of exposure.

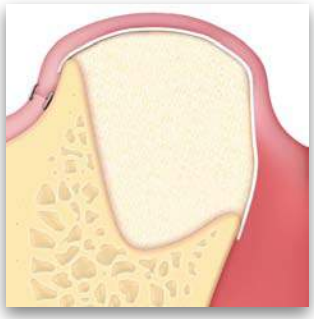
LATERAL ACCESS SINUS LIFT
maxillary sinus floor augmentation
case reports on page 84

DEHISCENCES AND FENESTRATIONS
peri-implant lesions
case reports on page 80

PERIODONTAL REGENERATION
intrabony defects
case reports on page 92



ALVEOLAR REGENERATION
graft protection
case reports on page 77



HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 87

VERTICAL AUGMENTATION
inlay technique
case reports on page 90

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) NANNMARK U, SENNERBY L
THE BONE TISSUE RESPONSES TO PREHYDRATED AND COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS: A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2008 DEC;10(4):264-70

(2) KILINC A, ATAOL M
HOW EFFECTIVE IS COLLAGEN RESORBABLE MEMBRANE PLACEMENT AFTER PARTIALLY IMPACTED MANDIBULAR THIRD MOLAR SURGERY ON POSTOPERATIVE MORBIDITY? A PROSPECTIVE RANDOMIZED COMPARATIVE STUDY
BMC ORAL HEALTH, 2017 OCT 5;17(1):126

(3) BARONE A, BORGIA V, COVANI U, RICCI M, PIATTELLI A, IEZZI G
FLAP VERSUS FLAPLESS PROCEDURE FOR RIDGE PRESERVATION IN ALVEOLAR EXTRACTION SOCKETS: A HISTOLOGICAL EVALUATION IN A RANDOMIZED CLINICAL TRIAL
CLIN ORAL IMPLANTS RES, 2015 JUL;26(7):806-13

(4) BARONE A, RICCI M, TONELLI P, SANTINI S, COVANI U
TISSUE CHANGES OF EXTRACTION SOCKETS IN HUMANS: A COMPARISON OF SPONTANEOUS HEALING VS. RIDGE PRESERVATION WITH SECONDARY SOFT TISSUE HEALING
CLIN ORAL IMPLANTS RES, 2013 NOV;24(11):1231-7

(5) GIULIANI A, IEZZI G, MAZZONI S, PIATTELLI A, PERROTTI V, BARONE A
REGENERATIVE PROPERTIES OF COLLAGENATED PORCINE BONE GRAFTS IN HUMAN MAXILLA: DEMONSTRATIVE STUDY OF THE KINETICS BY SYNCHROTRON RADIATION MICROTOMOGRAPHY AND LIGHT MICROSCOPY
CLIN ORAL INVEST, 2017 2018 JAN;22(1):505-513

(6) BARONE A, RICCI M, GRASSI RF, NANNMARK U, QUARANTA A, COVANI U
A 6-MONTH HISTOLOGICAL ANALYSIS ON MAXILLARY SINUS AUGMENTATION WITH AND WITHOUT USE OF COLLAGEN MEMBRANES OVER THE OSTEOTOMY WINDOW: RANDOMIZED CLINICAL TRIAL
CLIN ORAL IMPLANTS RES, 2013 JAN;24(1):1-6

(7) SCARANO A, PIATTELLI A, PERROTTI V, MANZON L, IEZZI G
MAXILLARY SINUS AUGMENTATION IN HUMANS USING CORTICAL PORCINE BONE: A HISTOLOGICAL AND HISTOMORPHOMETRICAL EVALUATION AFTER 4 AND 6 MONTHS
CLIN IMPLANT DENT RELAT RES, 2011 MAR; 13(1):13-18

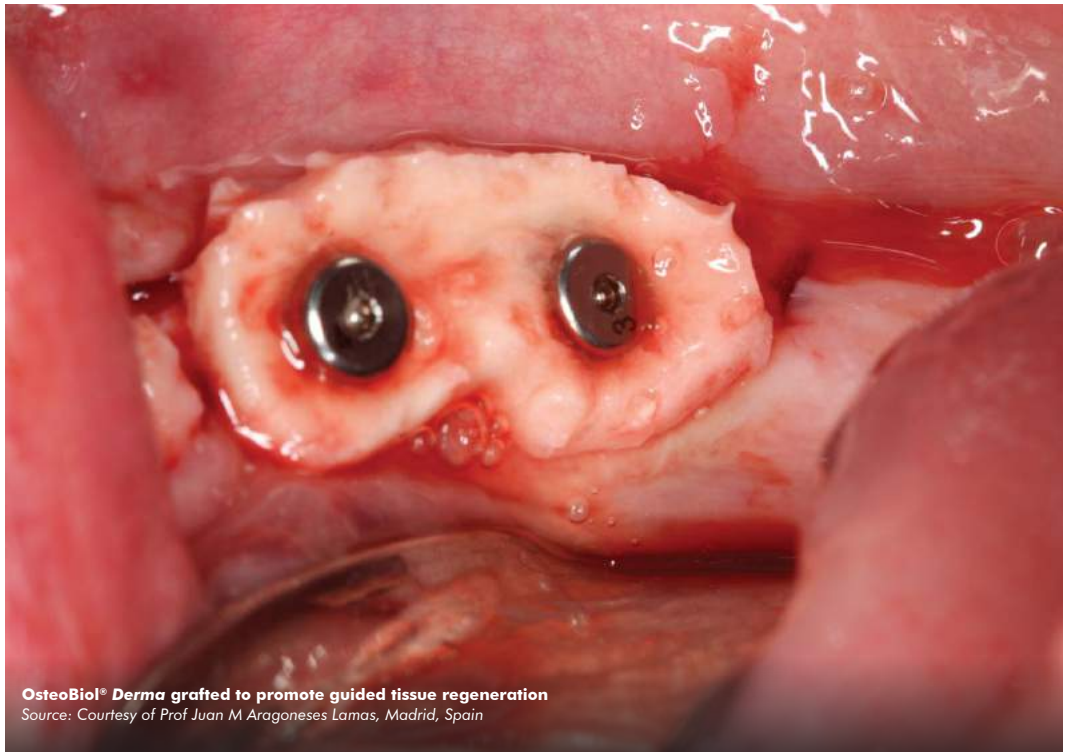
(8) CASSETTA M, RICCI L, IEZZI G, CALASSO S, PIATTELLI A, PERROTTI V
USE OF PIEZOSURGERY DURING MAXILLARY SINUS ELEVATION: CLINICAL RESULTS OF 40 CONSECUTIVE CASES
INT J PERIODONTICS RESTORATIVE DENT, 2012 DEC;32(6):E182-8

(9) BARONE A, MARCONCINI S, GIAMMARINARO E, MIJIRITSKY E, GELPI F, COVANI U
CLINICAL OUTCOMES OF IMPLANTS PLACED IN EXTRACTION SOCKETS AND IMMEDIATELY RESTORED: A 7-YEAR SINGLE-COHORT PROSPECTIVE STUDY
CLIN IMPLANT DENT RELAT RES, 2016 DEC;18(6):1103-1112

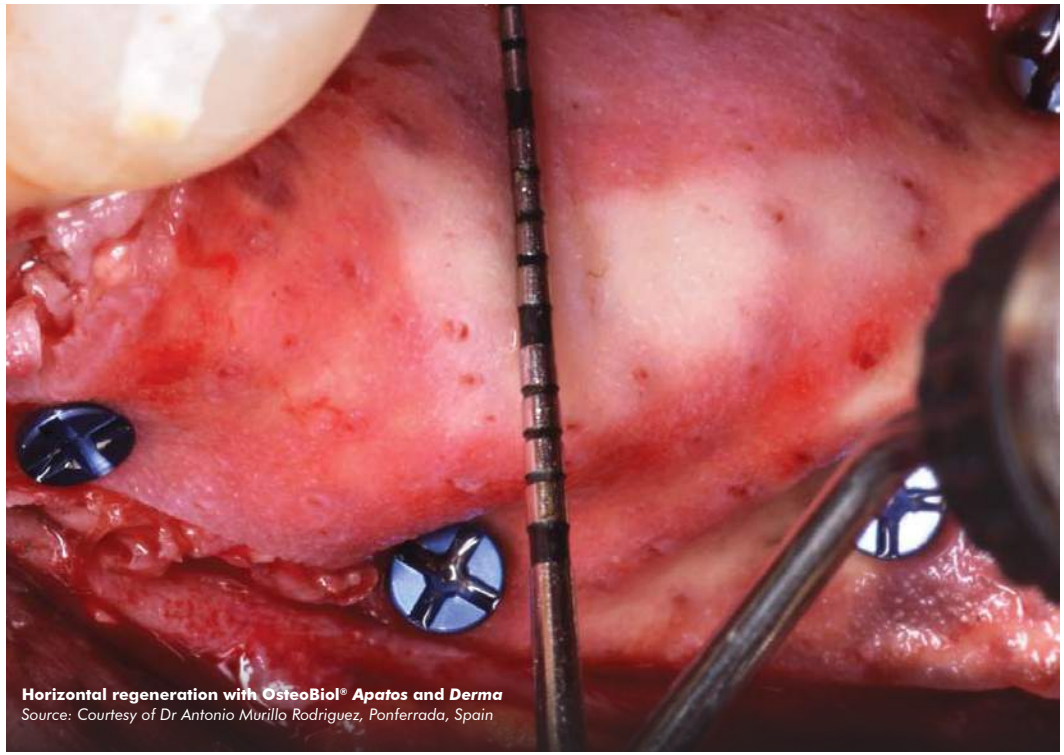
(10) ESPOSITO M, GRUSOVIN MG, LAMBERT F, MATOS S, PIETRUSKA M, ROSSI R, SALHI L, BUTI J
THE EFFECTIVENESS OF A RESORBABLE BONE SUBSTITUTE WITH A RESORBABLE MEMBRANE IN THE TREATMENT OF PERIODONTAL INFRABONY DEFECT - A MULTICENTER RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2015;8(3):233-244

(11) FELICE P, PIANA L, CHECCHI L, CORVINO V, NANNMARK U, PIATTELLI M
VERTICAL RIDGE AUGMENTATION OF ATROPHIC POSTERIOR MANDIBLE WITH AN INLAY TECHNIQUE AND CANCELLOUS EQUINE BONE BLOCK: A CASE REPORT
INT J PERIODONTICS RESTORATIVE DENT, 2013 MAR;33(2):159-66

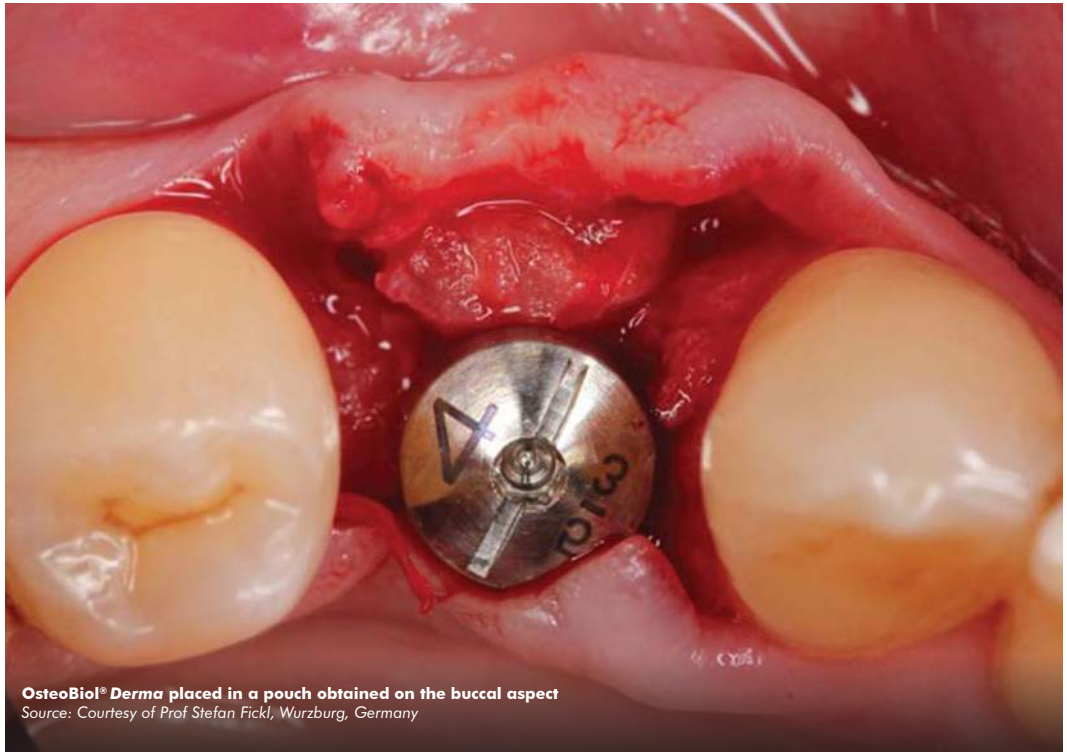
For further information see the complete literature on p. 114



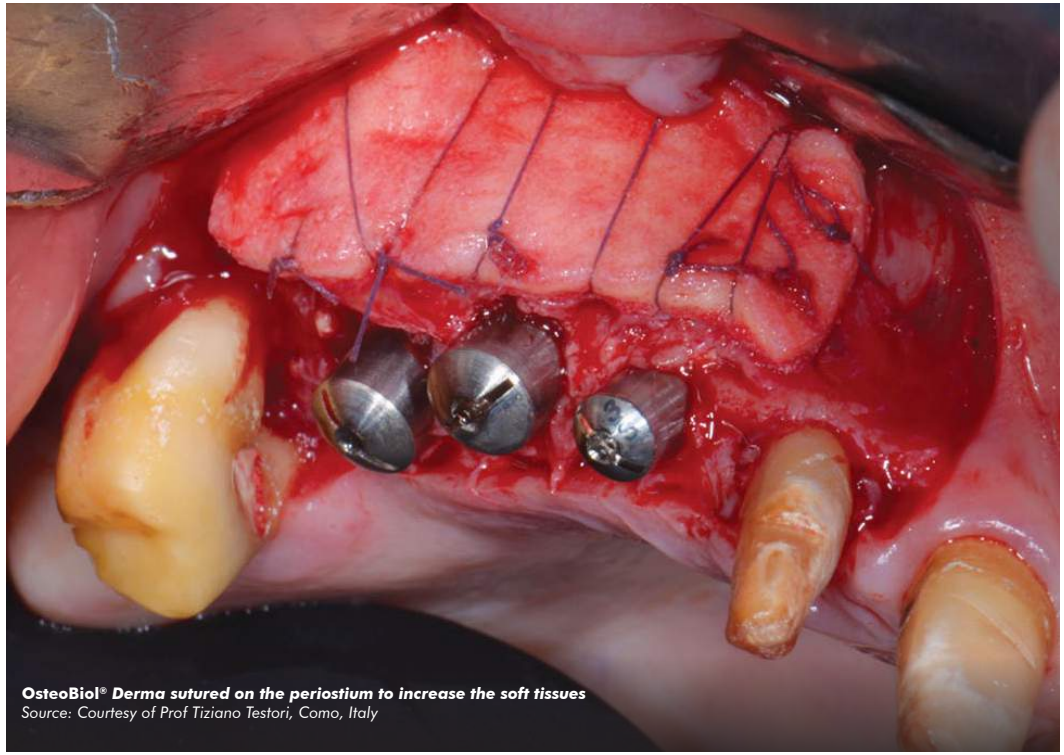
OsteoBiol® *Derma* grafted to promote guided tissue regeneration
Source: Courtesy of Prof Juan M Aragoneses Lamas, Madrid, Spain



Horizontal regeneration with OsteoBiol® *Apatos* and *Derma*
Source: Courtesy of Dr Antonio Murillo Rodriguez, Ponferrada, Spain



OsteoBiol® *Derma* placed in a pouch obtained on the buccal aspect
Source: Courtesy of Prof Stefan Fickl, Wurzburg, Germany



OsteoBiol® *Derma sutured on the periostium to increase the soft tissues*
Source: Courtesy of Prof Tiziano Testori, Como, Italy

Derma

A xenogenic graft for soft tissue augmentation

Collagen dermal matrix

Tissue of origin
Porcine derma

Tissue collagen
Preserved

Physical form
Dried membrane

Composition
100% derma

Thickness
X-Fine: 0.6 mm (±0.1 mm)
Fine: 0.9 mm (±0.1 mm)
Standard: 2.0 mm (±0.2 mm)

Estimated resorption time
X-Fine: about 1 month
Fine: about 3 months
Standard: about 5 months

Size
X-Fine: 20x20 mm
Fine: 25x25 mm, 12x8 mm, 50x50 mm
Standard: 15x5 mm, 30x30 mm, 50x50 mm

Product codes
ED02LS | 20x20 mm | X-Fine | Porcine
ED21FS | 12x8 mm | Fine | Porcine
ED25FS | 25x25 mm | Fine | Porcine
ED05FS | 50x50 mm | Fine | Porcine
ED03SS | 30x30 mm | Standard | Porcine
ED15SS | 15x5 mm | Standard | Porcine
ED05SS | 50x50 mm | Standard | Porcine

GMDN code
38746

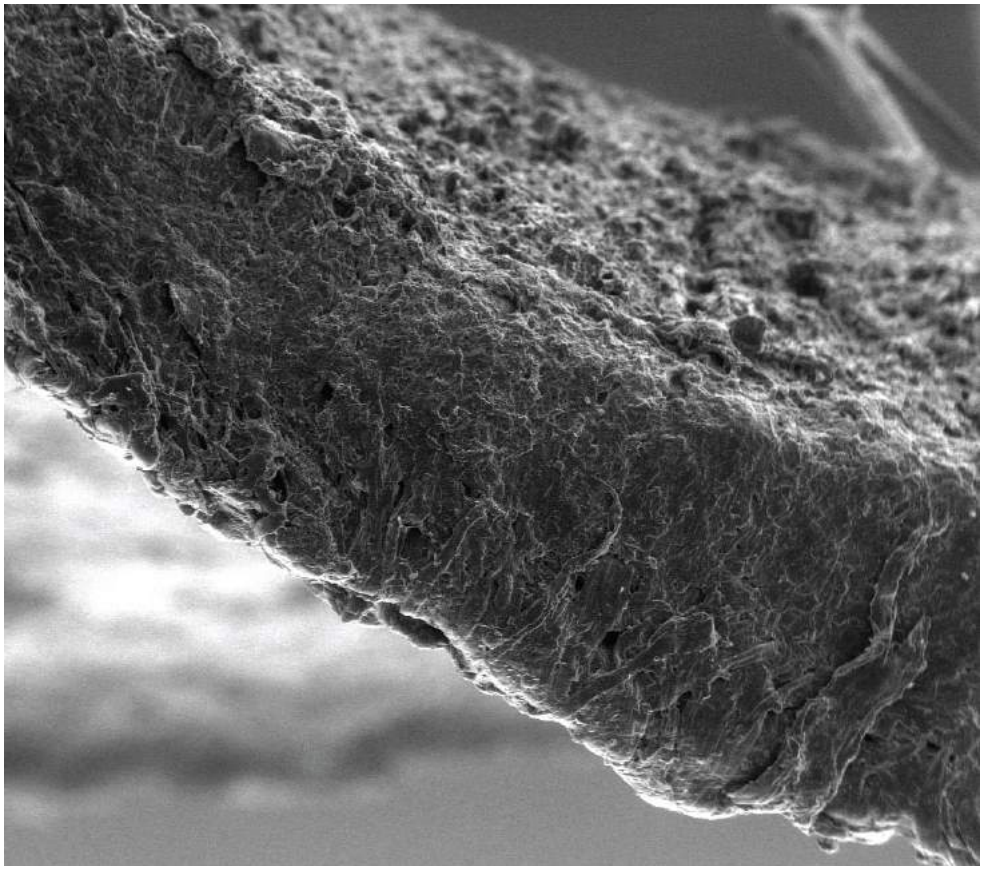
Characteristics and handling

CHARACTERISTICS

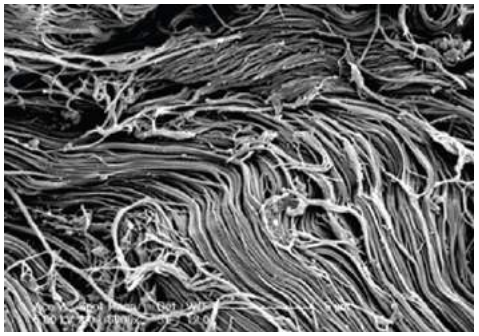
Obtained from derma of porcine origin, using an exclusive Tecnoss® process that preserves the natural collagen fibers[1], *Derma* membranes are gradually integrated[2] with the autologous soft tissues. Their strong consistency and resistance allow a perfect stabilization and a prolonged protection of underlying graft[3] in socket regeneration procedures, together with a strong barrier action to guide the growth of epithelium and preventing its invagination.

HANDLING

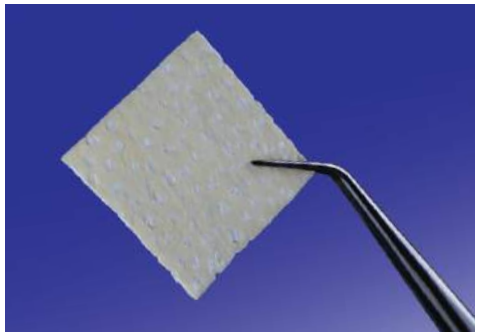
Derma membrane can be shaped with scissors until the desired size is reached; then it must be thoroughly hydrated in sterile lukewarm physiological solution until the desired consistency is obtained. Once it acquires the desired plasticity, it must be adapted to the grafting site. It is always recommendable to prepare a pocket with an elevator in order to stabilize the membrane in the site after stitching the flaps.



SEM image of OsteoBiol® *Derma*
Source: Politecnico di Torino, Italy



SEM image of *Derma* collagen fibers
Source: Courtesy of Dr Kai R. Fischer, Wurzburg, Germany



Source: Tecnoss® Dental Media Library

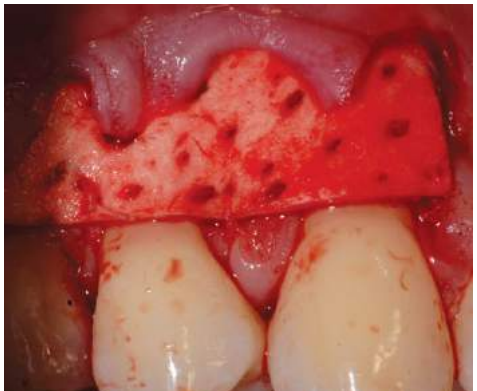
Clinical Indications

Derma membrane is a collagen resorbable barrier useful to protect and stabilize bone grafting materials; only in this specific indication it can be used also in open healing[3] situations due to its perfect tissue integration characteristics.

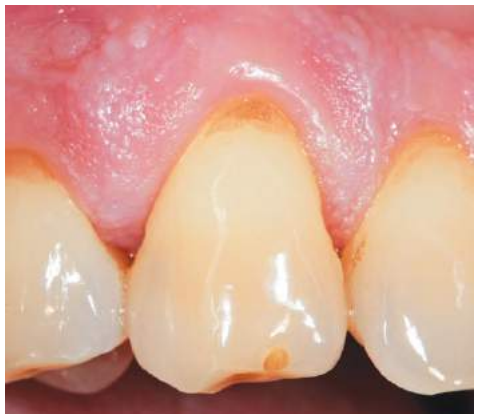
If a residual band of keratinized tissue is still present around teeth or implants, *Derma* membrane can be used as an alternative to connective tissue graft[2] to improve the quality of keratinized tissues[4].

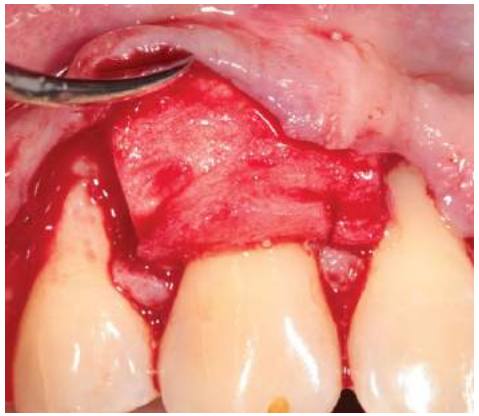
Mild gingival recessions[5] can be treated with *Derma* to avoid patient morbidity and discomfort due to connective tissue graft harvesting. It is recommended to leave *Derma* membrane completely covered by the coronally advanced flap and to avoid membrane exposure. A properly shaped *Derma* membrane with rounded edges is also indicated for the tunnel technique[5].

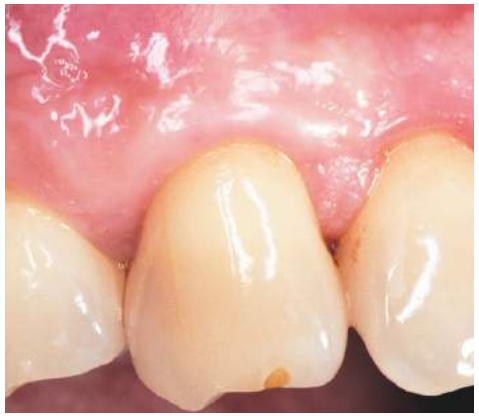
In oral surgery and traumatology *Derma* is indicated in the stabilization and protection of large regeneration with risks of exposure.



OsteoBiol® *Derma* shaped for a gingival recession treatment
Source: Courtesy of Dr Roberto Rossi, Genova, Italy



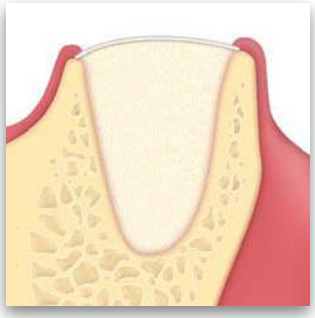




Gingival recession treated with OsteoBiol® *Derma*
Source: Courtesy of Dr Domenico Patarino, Varese, Italy

SOFT TISSUE AUGMENTATION
soft tissue improvement
case reports on page 94

PERIODONTAL REGENERATION
gingival recessions
case reports on page 92



ALVEOLAR REGENERATION
graft protection
case reports on page 77

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) DE MARCO P, ZARA S, DE COLLI M, RADUNOVIC M, LAZOVIC V, ETTORRE V, DI CRESCENZO A, PIATTELLI A, CATALDI A, FONTANA A
GRAPHENE OXIDE IMPROVES THE BIOCOMPATIBILITY OF COLLAGEN MEMBRANES IN AN IN VITRO MODEL OF HUMAN PRIMARY GINGIVAL FIBROBLASTS
BIOMED MATER, 2017 SEP 13;12(5):055005

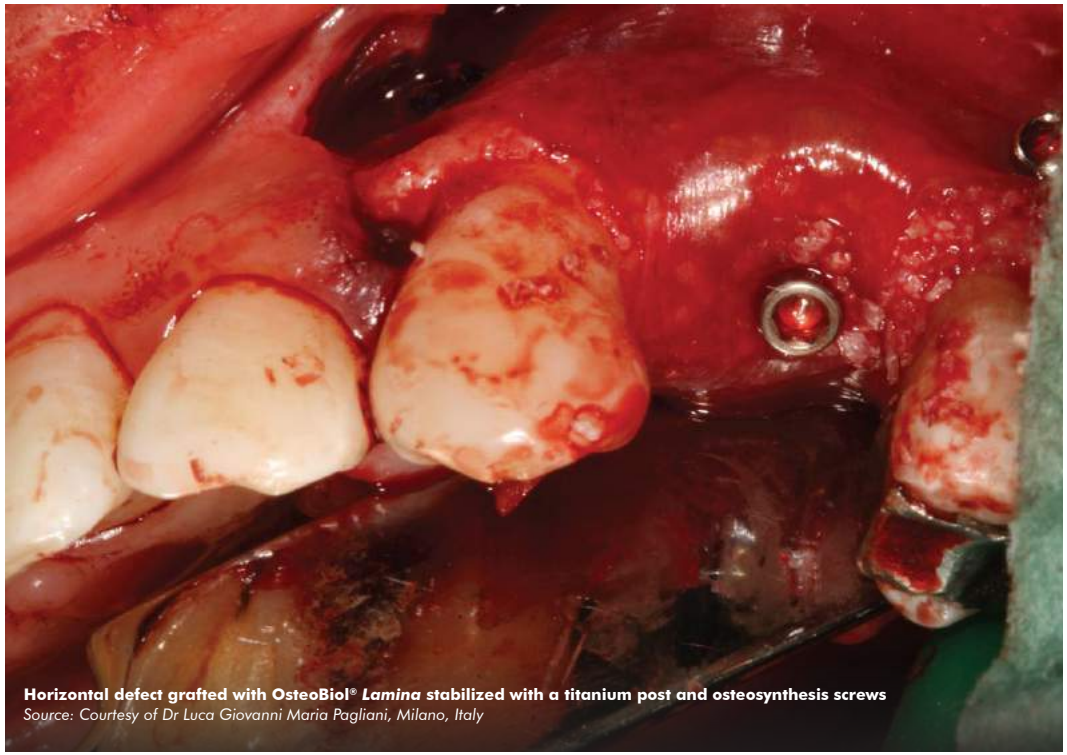
(2) FICKL S, NANNMARK U, SCHLAGENHAUF U, HÜRZELER M, KEBSCHULL M
PORCINE DERMAL MATRIX IN THE TREATMENT OF DEHISCENCE-TYPE DEFECTS – AN EXPERIMENTAL SPLIT-MOUTH ANIMAL TRIAL
CLIN ORAL IMPLANTS RES, 2015 JUL;26(7):799-805

(3) TALLARICO M, XHANARI E, PISANO M, DE RIU G, TULLIO A, MELONI SM
SINGLE POST-EXTRACTIVE ULTRA-WIDE 7 MM-DIAMETER IMPLANTS VERSUS IMPLANTS PLACED IN MOLAR HEALED SITES AFTER SOCKET PRESERVATION FOR MOLAR REPLACEMENT: 6-MONTH POST-LOADING RESULTS FROM A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2016;9(3):263-275

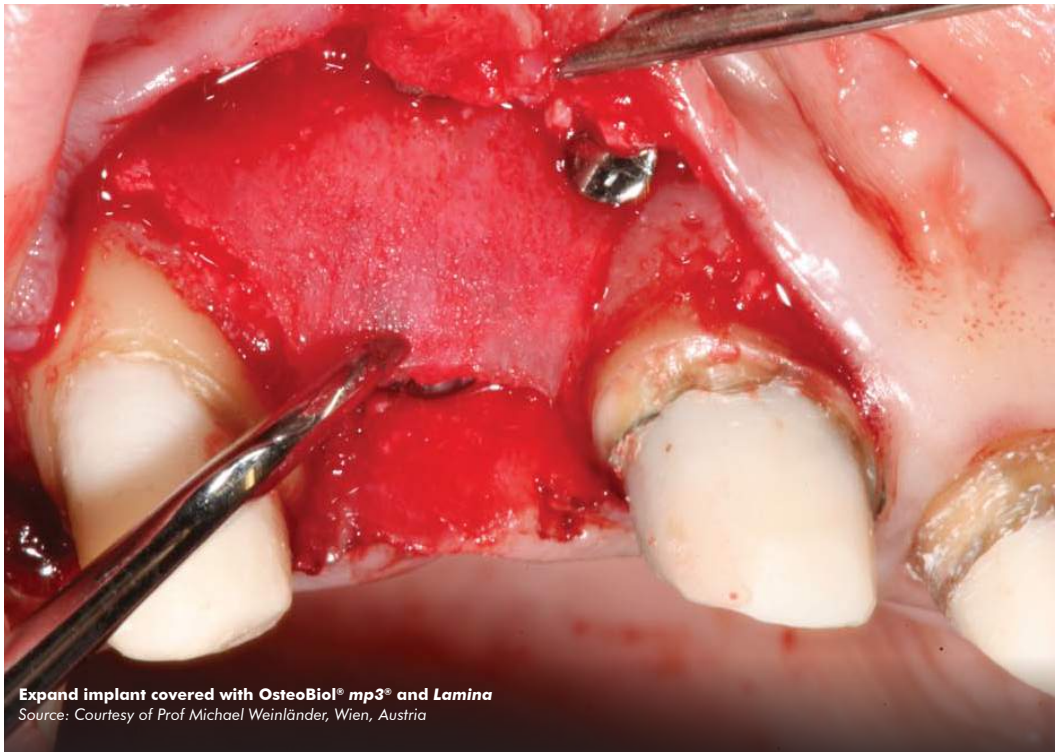
(4) FISCHER KR, FICKL S, MARDAS N, BOZEC L, DONOS N
STAGE-TWO SURGERY USING COLLAGEN SOFT TISSUE GRAFTS: CLINICAL CASES AND ULTRASTRUCTURAL ANALYSIS
QUINTESSENCE INT, 2014 NOV-DEC;45(10):853-60

(5) FICKL S, JOCKEL-SCHNEIDER Y, LINCKE T, BECHTOLD M, FISCHER KR, SCHLAGENHAUF U
PORCINE DERMAL MATRIX FOR COVERING OF RECESSION TYPE DEFECTS: A CASE SERIES
QUINTESSENCE INT, 2013;44(3):243-6

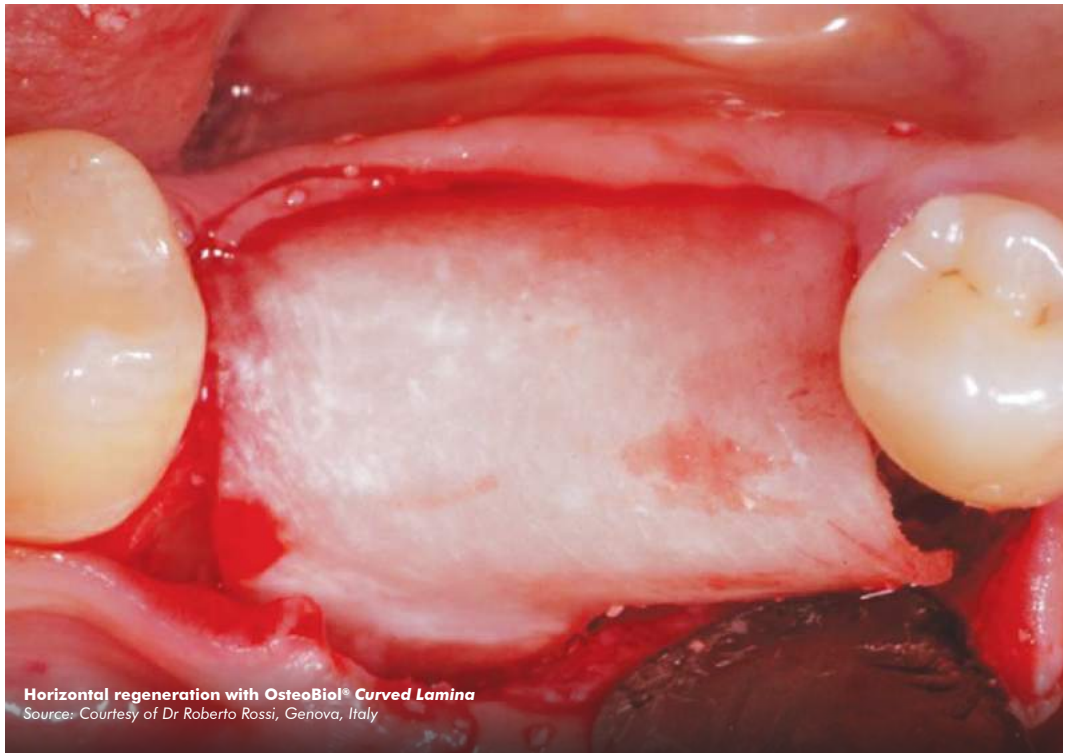
For further information see the complete literature on p. 114



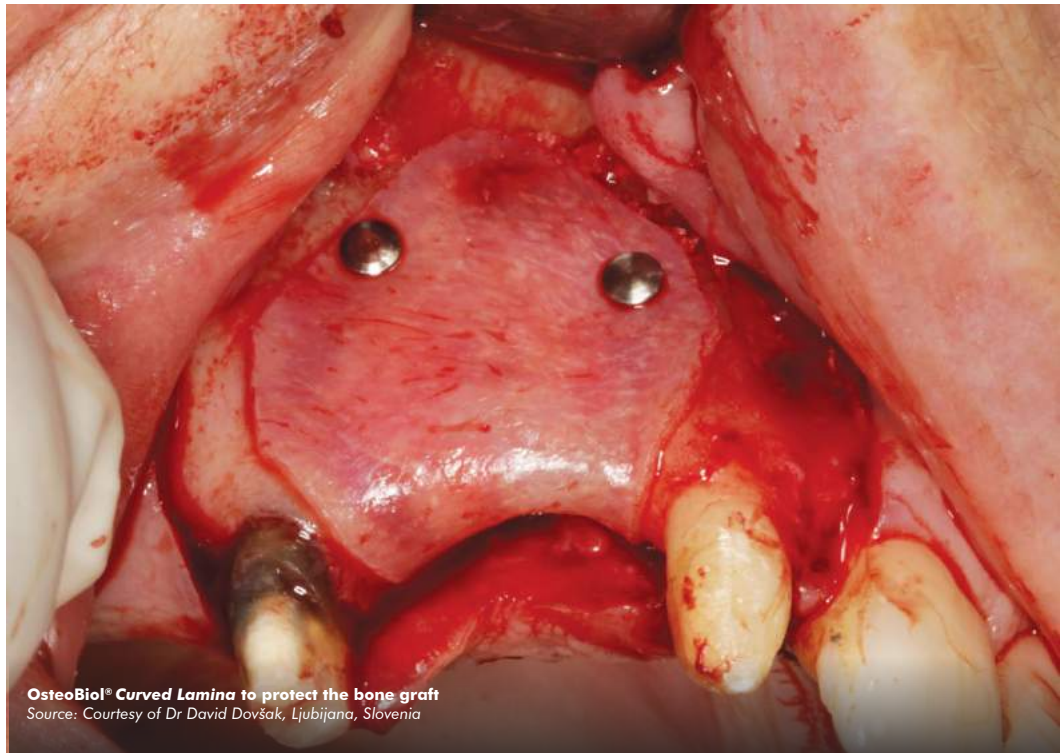
Horizontal defect grafted with OsteoBiol® *Lamina* stabilized with a titanium post and osteosynthesis screws
Source: Courtesy of Dr Luca Giovanni Maria Pagliani, Milano, Italy



Expand implant covered with OsteoBiol® *mp3*® and *Lamina*
Source: Courtesy of Prof Michael Weinländer, Wien, Austria



Horizontal regeneration with OsteoBiol® *Curved Lamina*
Source: Courtesy of Dr Roberto Rossi, Genova, Italy



OsteoBiol® *Curved Lamina* to protect the bone graft
Source: Courtesy of Dr David Dovšak, Ljubijana, Slovenia

Lamina

A unique cortical bone barrier

Heterologous collagenated cortical bone

Tissue of origin
Cortical bone

Tissue collagen
Preserved

Physical form
Lamina: Semi-rigid dried lamina, flexible after re-hydration
Semi Soft Lamina: Rigid dried lamina, flexible after re-hydration

Composition
100% cortical bone

Thickness
Fine: 0.5 mm (±0.1 mm)
Medium: 1.0 mm (±0.1 mm)
Semi Soft: 1.0 mm (±0.1 mm)
Standard: 3.0 mm (±1 mm)

Estimated re-entry time
Fine: about 5 months
Medium: about 6 months
Semi Soft: about 8 months
Standard: about 8 months

Size
Fine: 25x25 mm, 25x35 mm (oval)
Medium: 35x35 mm (Curved), 20x40 mm
Semi Soft: 35x35 mm
Standard: 30x30 mm

Product codes
LS25FS | 25x25 mm | Fine | Porcine
LS25FE | 25x25 mm | Fine | Equine
LS23FS | 25x35 mm (Oval) | Fine | Porcine
LS23FE | 25x35 mm (Oval) | Fine | Equine
LS10HS | 35x35 mm (Curved) | Medium | Porcine
LS10HE | 35x35 mm (Curved) | Medium | Equine
LS35LS | 35x35 mm (Semi Soft) | Medium | Porcine
LS35LE | 35x35 mm (Semi Soft) | Medium | Equine
LS24LS | 20x40 mm | Medium | Porcine
LS03SS | 30x30 mm | Standard | Porcine

GMDN code
38746

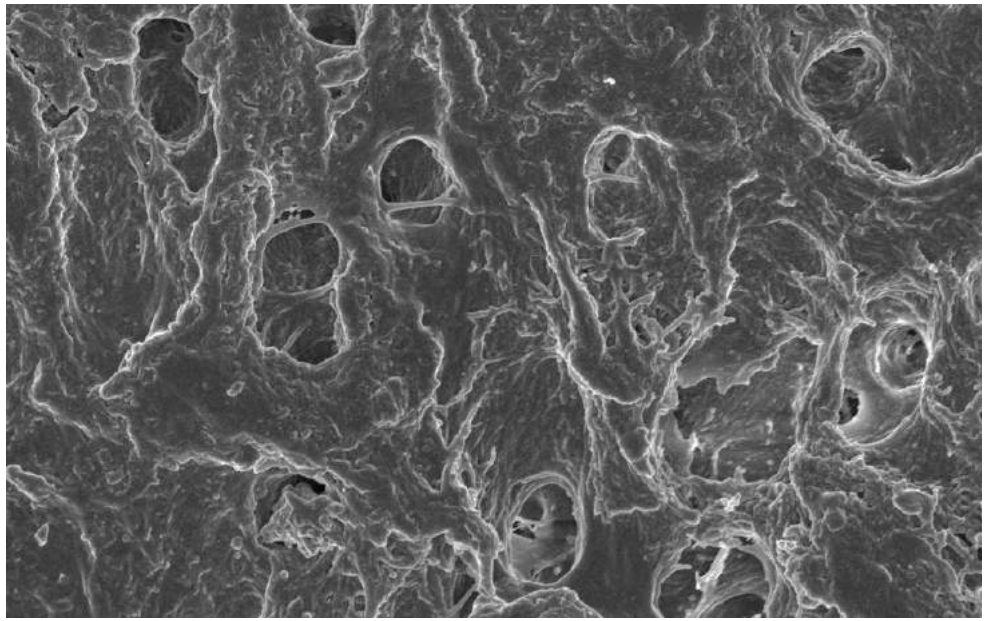
Characteristics and handling

CHARACTERISTICS

Lamina is made of cortical bone of heterologous origin produced with an exclusive Tecnoss® process that avoids the ceramization of hydroxyapatite crystals, thus allowing physiological resorption. After a process of superficial decalcification, it acquires an elastic consistency, nevertheless maintaining the typical compactness of the bone tissue from which it originates; the margins are soft in order not to cause micro traumas to the surrounding tissues. *Curved Lamina* has a semi-rigid consistency and can be grafted without hydration, provided that it is previously shaped to fit the defect morphology. *Semi Soft Lamina* undergoes a process of superficial semi-decalcification (50% vs *Lamina*) therefore increasing its consistency, tipical of the cortical bone tissue.

HANDLING

Lamina can be shaped with sterile scissors until the desired size is reached, then it must be hydrated for 5/10 minutes in sterile physiological solution. Once it acquires the desired plasticity, it must be adapted to the grafting site; it should always be immobilized either with titanium microscrews or sutured (fine model) directly to the surrounding tissues with a triangular section non-traumatic needle. *Curved Lamina* should not be hydrated in order to maintain its tenting effect but can also be shaped with sterile scissors, and must be fixated with osteosynthesis screws. In case of exposure, *Lamina* should only be removed if there is a clear suprainfection, because its consistency is such as to allow it to achieve a complete second intention healing of the wound.



SEM image of OsteoBiol® *Lamina*
Source: Politecnico di Torino, Italy

Source: Tecnoss® Dental Media Library

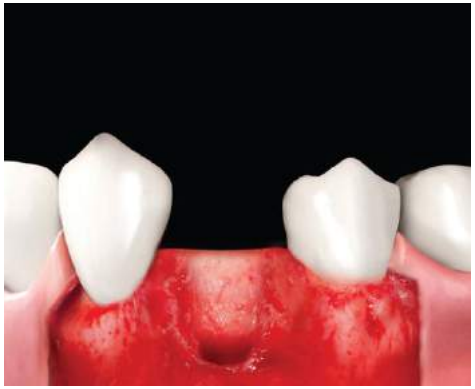
Clinical Indications

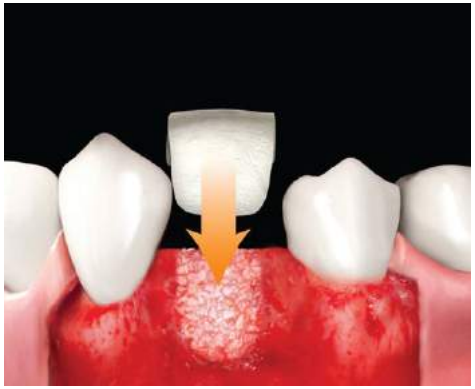
free animated videos
on OsteoBiol® APP

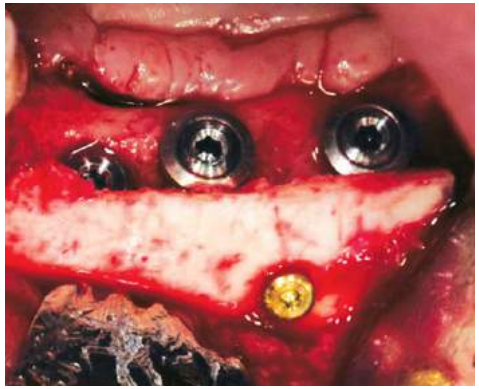
Available on the App Store | Get it on Google play

Lamina becomes flexible after hydration and can be shaped[1] and adapted to the defect morphology creating, once fixated with osteosynthesis screws, a semi-rigid covering to the underlying graft[2-4]. This property is particularly useful when it is necessary to obtain a space making effect in aesthetic areas, as well as in horizontal augmentation[4,5] of two wall defects and antrostomy covering in lateral access sinus lift procedures[3,6]. *Lamina* can also be used in regenerations with risks of exposure. *Curved Lamina* has a 0.8-1.0 mm thickness and can be directly grafted without hydration[7]: it is particularly indicated in association with *mp3*® for regeneration of ridges with compromised cortical plate[1].

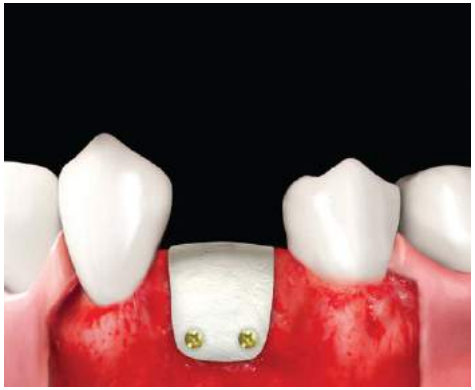
Semi Soft Lamina is indicated for orbital floor and wall reconstruction[8-10] after trauma in non-load-bearing indications, unless used in combination with appropriate osteosynthesis fixation.



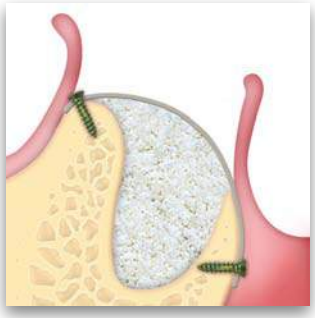




Bone Layer technique with OsteoBiol® *Lamina*
Source: Courtesy of Dr Michele Antonio Lopez, Rome, Italy

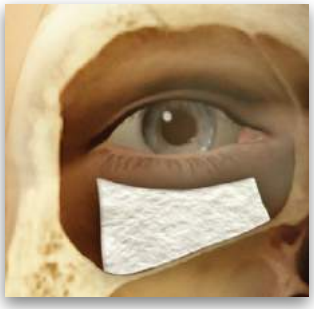


OsteoBiol® *Lamina* positioning
Source: Tecnoss® Dental Media Library



HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 87

HORIZONTAL AUGMENTATION
bone-layer technique



ORBITAL FLOOR RESTORATION

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) ROSSI R, RANCITELLI D, POLI PP, RASIA DAL POLO M, NANNMARK U, MAIORANA C
THE USE OF A COLLAGENATED PORCINE CORTICAL LAMINA IN THE RECONSTRUCTION OF ALVEOLAR RIDGE DEFECTS. A CLINICAL AND HISTOLOGICAL STUDY
MINERVA STOMATOL, 2016 OCT;65(5):257-68

(2) PAGLIANI L, ANDERSSON P, LANZA M, NAPPO A, VERROCCHI D, VOLPE S, SENNERBY L
A COLLAGENATED PORCINE BONE SUBSTITUTE FOR AUGMENTATION AT NEOSS IMPLANT SITES: A PROSPECTIVE 1-YEAR MULTICENTER CASE SERIES STUDY WITH HISTOLOGY
CLIN IMPLANT DENT RELAT RES, 2012 OCT;14(5):746-58

(3) FESTA VM, ADDABBO F, LAINO L, FEMIANO F, RULLO R
PORCINE-DERIVED XENOGRAFT COMBINED WITH A SOFT CORTICAL MEMBRANE VERSUS EXTRACTION ALONE FOR IMPLANT SITE DEVELOPMENT: A CLINICAL STUDY IN HUMANS
CLIN IMPLANT DENT AND RELAT RES, 2013 OCT;15(5):707-13

(4) WACHTEL H, FICKL S, HINZE M, BOLZ W, THALMAIR T
THE BONE LAMINA TECHNIQUE: A NOVEL APPROACH FOR LATERAL RIDGE AUGMENTATION - A CASE SERIES
INT J PERIODONTICS RESTORATIVE DENT, 2013 JUL-AUG;33(4):491-7

(5) LOPEZ MA, ANDREASI BASSI M, CONFALONE L, CARINCI F, ORMIANER Z, LAURITANO D
THE USE OF RESORBABLE CORTICAL LAMINA AND MICRONIZED COLLAGENATED BONE IN THE REGENERATION OF ATROPHIC CRESTAL RIDGES: A SURGICAL TECHNIQUE. CASE SERIES
J BIOL REGUL HOMEOST AGENTS, 2016 APR-JUN;30(2 SUPPL 1):81-85

(6) HINZE M, VRIELINCK L, THALMAIR T, WACHTEL H, BOLZ W
ZYGOMATIC IMPLANT PLACEMENT IN CONJUCTION WITH SINUS BONE GRAFTING: THE "EXTENDED SINUS ELEVATION TECHNIQUE". A CASE-COHORT STUDY
ORAL CRANIOFAC TISSUE ENG, 2011;1:188–197

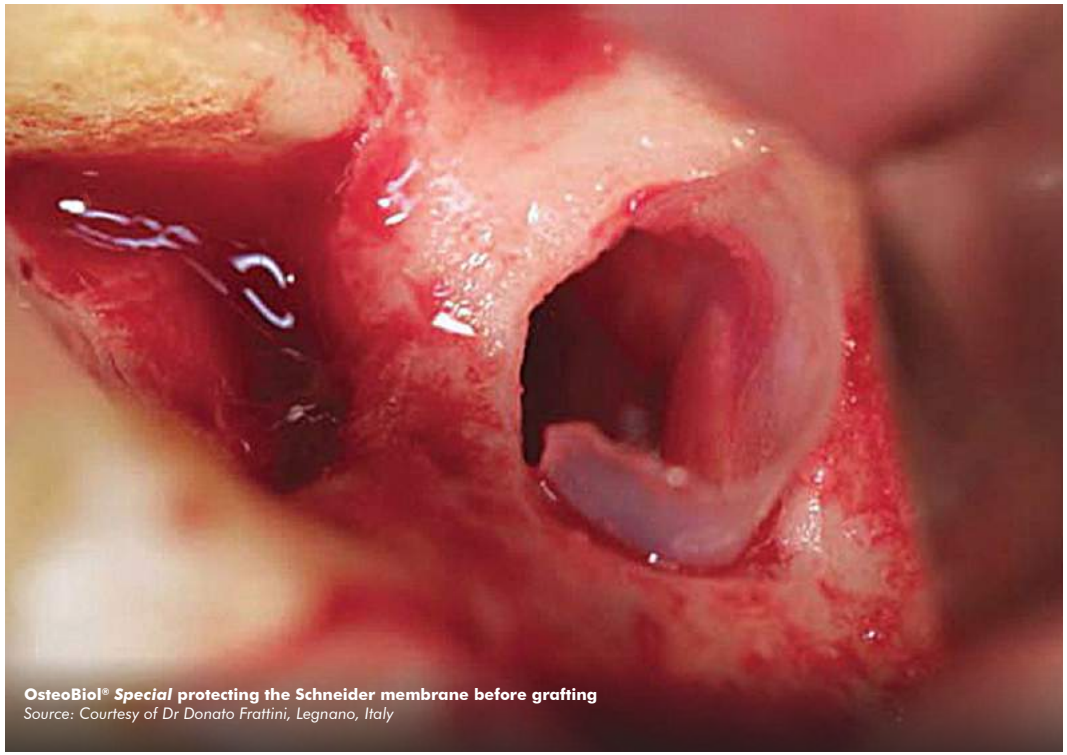
(7) ROSSI R, FOCE E, SCOLAVINO S
THE CORTICAL LAMINA TECHNIQUE: A NEW OPTION FOR ALVEOLAR RIDGE AUGMENTATION. PROCEDURE, PROTOCOL, AND CASE REPORT
J LEBANESE DENTAL ASS, 2017 JAN-JUN; 52(1):35-41

(8) RINNA C, REALE G, FORESTA E, MUSTAZZA MC
MEDIAL ORBITAL WALL RECONSTRUCTION WITH SWINE BONE CORTEX
J CRANIOFAC SURG, 2009 MAY; 20(3):881-4

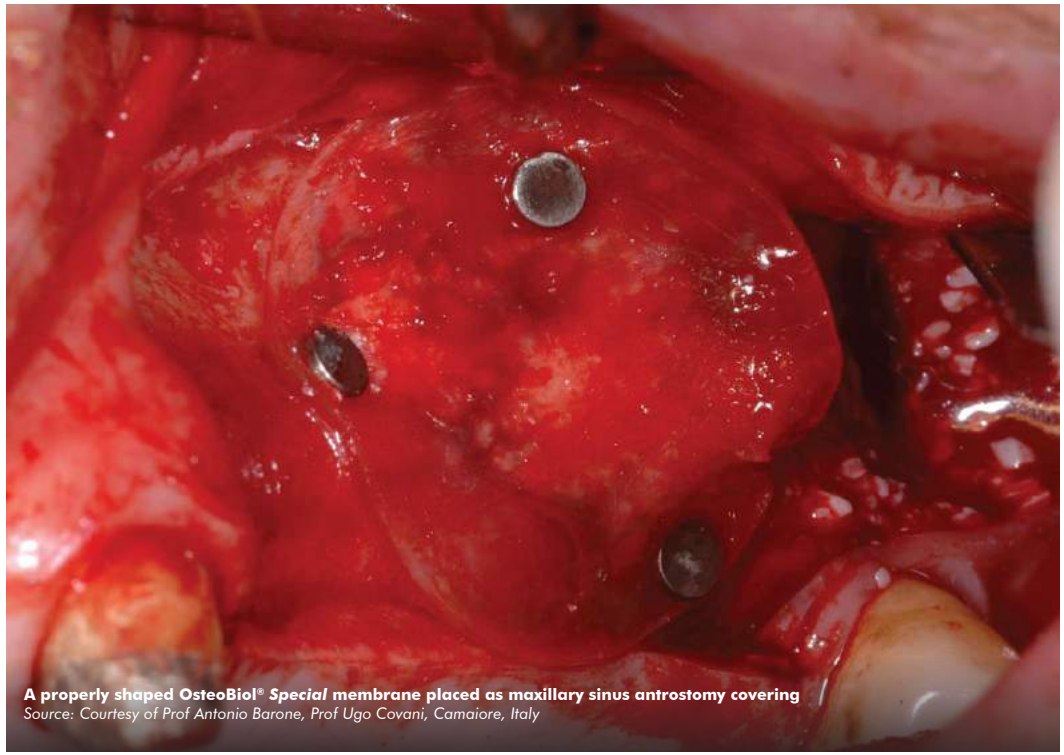
(9) OZEL B, FINDIKCIOGLU K, SEZGIN B, GUNEY K, BARUT I, OZMEN S
A NEW OPTION FOR THE RECONSTRUCTION OF ORBITAL FLOOR DEFECTS WITH HETEROLOGOUS CORTICAL BONE
J CRANIOMAXILLOFAC SURG, 2015 OCT;43(8):1583-8

(10) RINNA C, UNGARI C, SALTAREL A, CASSONI A, REALE G
ORBITAL FLOOR RESTORATION
J CRANIOFAC SURG, 2005 NOV; 16(6):968-72

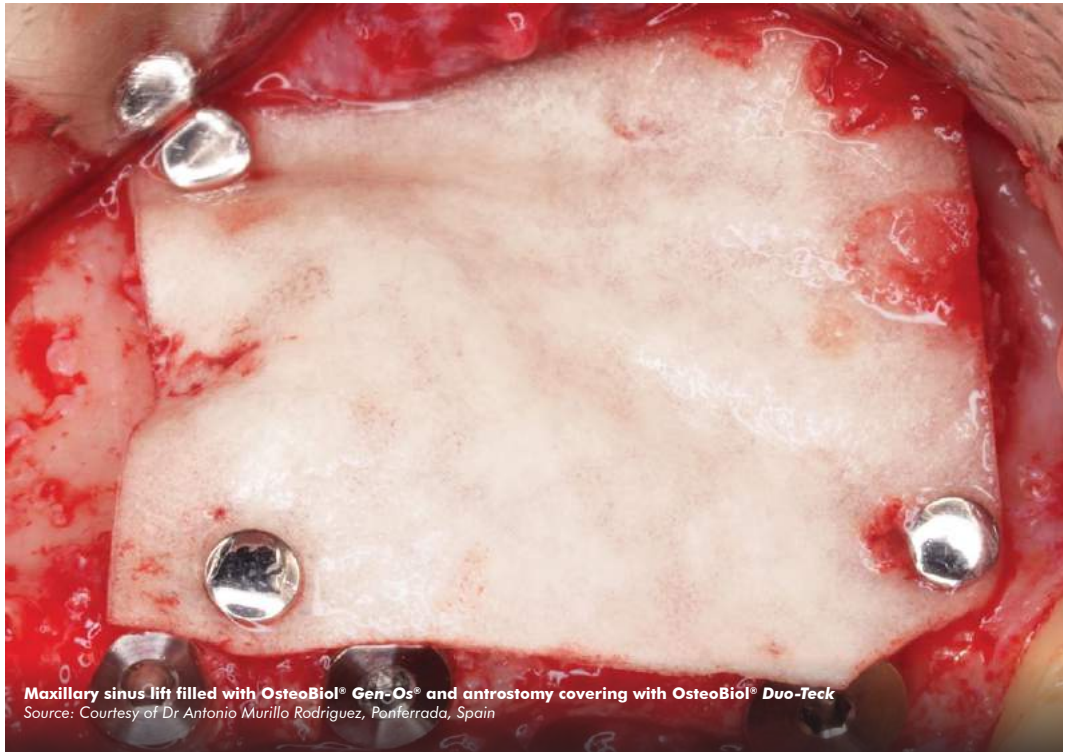
For further information see the complete literature on p. 114



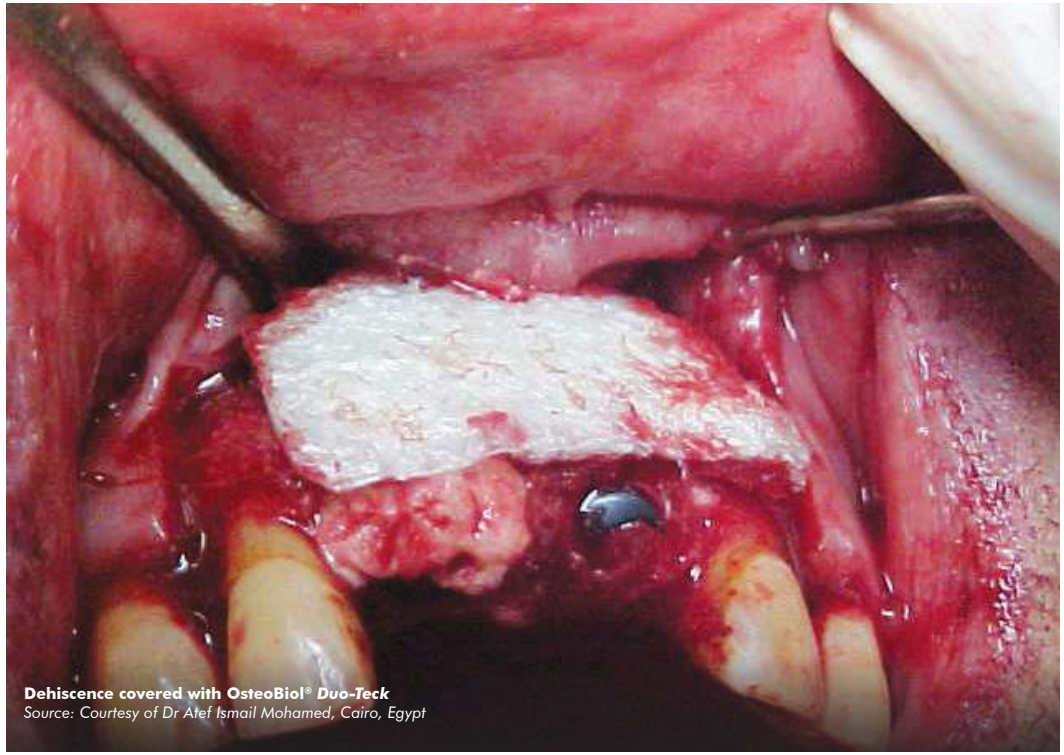
OsteoBiol® *Special* protecting the Schneider membrane before grafting
Source: Courtesy of Dr Donato Frattini, Legnano, Italy



A properly shaped OsteoBiol® *Special* membrane placed as maxillary sinus antrostomy covering
Source: Courtesy of Prof Antonio Barone, Prof Ugo Covani, Camaiore, Italy



Maxillary sinus lift filled with OsteoBiol® *Gen-Os*® and antrostomy covering with OsteoBiol® *Duo-Teck*
Source: Courtesy of Dr Antonio Murillo Rodriguez, Ponferrada, Spain



Dehiscence covered with OsteoBiol® *Duo-Teck*
Source: Courtesy of Dr Atef Ismail Mohamed, Cairo, Egypt

Special

A translucent membrane to separate bone and soft tissues

Engineered to protect hard and soft tissue grafts

Duo-Teck

Collagen felt

Tissue of origin
Heterologous pericardium

Tissue collagen
Preserved

Physical form
Translucent dried membrane

Composition
100% pericardium

Thickness
Extra-fine: 0.2 mm

Resorption time
About 40 days

Size
20x20 mm, 30x30 mm

Product codes
EM02LE | 20x20 mm | Equine
EM03LE | 30x30 mm | Equine

GMDN code
38746

Characteristics, handling and clinical indications

CHARACTERISTICS

Obtained from extra fine pericardium of heterologous origin, using an exclusive Tecnoss® process, the dried *Special* membranes are completely resorbable. Once hydrated, they become translucent and flexible, guiding the growth of epithelium and preventing its invagination: their action favors therefore an optimal regeneration of the underlying bone tissue.

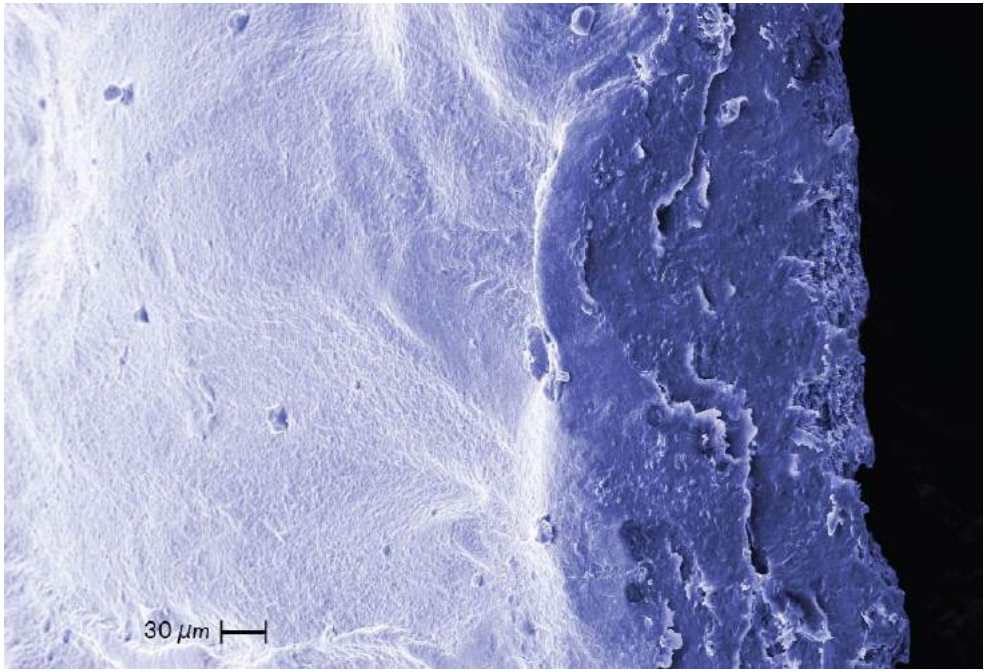
HANDLING

The membrane can be shaped with sterile scissors until the desired size is reached; it must then be rehydrated with lukewarm physiological solution. Once it acquires the desired plasticity, it must be adapted to the grafting site. It is recommended to prepare a pocket with an elevator in order to stabilize the membrane in the site after stitching the flaps. If this is not possible, the membrane can be stabilized with envelope sutures which bridle it with the gingival flaps.

CLINICAL INDICATIONS

In periodontology, the *Special* membrane can be used as a separator of bone and soft tissues in treatment of gingival recessions.

Special can be used to protect the sinus membrane before the insertion of the grafting material, to close sinus membrane perforations. Grafts placed in post-extractive sockets with closed healing procedure can also be protected with this membrane.



SEM images of OsteoBiol® *Special*
Source: Courtesy of Nobil Bio Ricerche, Villafranca d'Asti, Italy

PERIODONTAL REGENERATION
intrabony defects
case reports on page 92

LATERAL ACCESS SINUS LIFT
Schneider membrane protection
case reports on page 84

Characteristics, handling and clinical indications

CHARACTERISTICS

Duo-Teck is made of lyophilized collagen of equine origin, biocompatible and quickly resorbable.

The model DT020 differs from other membranes as it is coated on one side with a film of micronized bone, also of equine origin: this coating increases its consistency and stability, allowing good protection of grafts together with a correct repositioning of soft tissues.

HANDLING

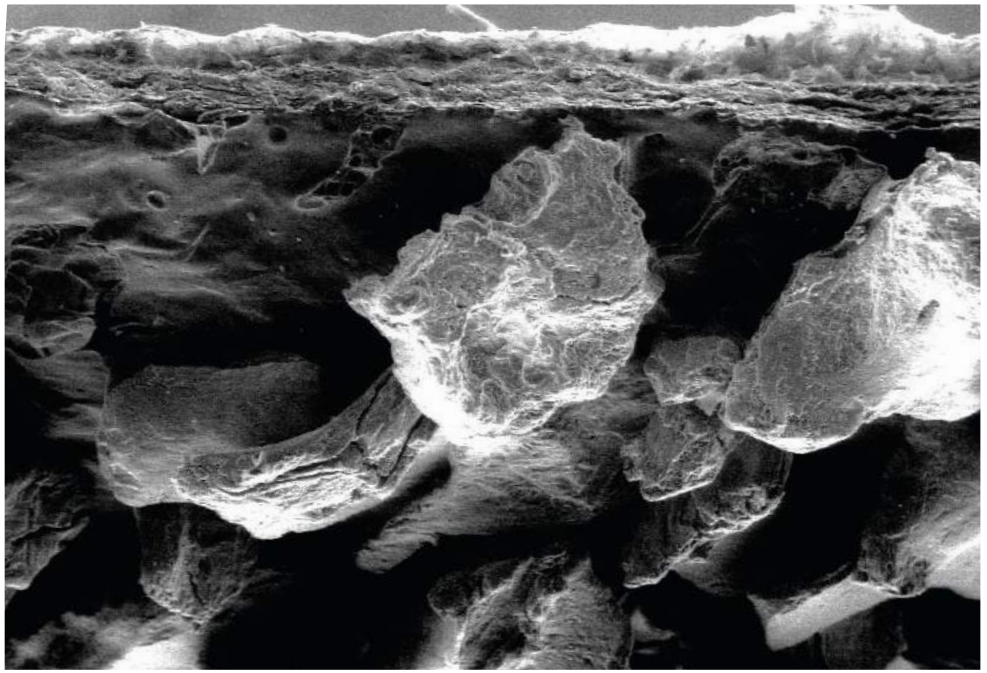
Duo-Teck can be easily placed directly in the grafting site with the micronized bone film side in contact with the graft and the smooth side in contact with the soft tissues.

CLINICAL INDICATIONS

Duo-Teck is indicated in all those cases where a "soft" separation between tissues of different consistency is necessary. *Duo-Teck* can be used to protect the maxillary sinus membrane in sinus floor augmentation procedures[1], in order to avoid accidental lesions caused by grafting material. It can also be used for closure of antrostomy, before replacement of the muco-gingival flap.

BIBLIOGRAPHY

(1) SANTAGATA M, GUARINIELLO L, RAUSO R, TARTARO G
IMMEDIATE LOADING OF DENTAL IMPLANT AFTER SINUS FLOOR ELEVATION WITH OSTEOTOME TECHNIQUE: A CLINICAL REPORT AND PRELIMINARY RADIOGRAPHIC RESULTS
J ORAL IMPLANTOL, 2010 DEC; 36(6):485-489



SEM image of OsteoBiol® *Duo-Teck*
Source: Politecnico di Torino, Italy

LATERAL ACCESS SINUS LIFT
maxillary sinus floor augmentation
case reports on page 84

DEHISCENCES AND FENESTRATIONS
peri-implant lesions
case reports on page 80

Additional case reports on osteobiol.com

Tissue of origin
Equine lyophilised collagen felt and equine bone (DT020)
Equine lyophilised collagen felt (DTN625)

Tissue collagen
Preserved

Physical form
Dried membrane covered with micronized bone (DT020)
Dried membrane (DTN625)

Composition
Collagen felt and bone granules (DT020)
Collagen felt (DTN625)

Granulometry

Up to 300 μm (DT020)

Thickness
With granules coating: 1.0 mm (±0.1 mm)
Collagen felt only: 0.2 mm (±0.05 mm)

Estimated resorption time
About 15 days

Size
20x20 mm (DT020)
25x25 mm (DTN625)

Product codes
With granules coating
DT020 | 1 Blister | 20x20 mm | Equine
Collagen felt only
DTN625 | 6 Blisters | 25x25 mm | Equine

GMDN code
38746

Success through innovation:

Products launch

Gen-Os®

Apatos

Gel 40

Special

Lamina

Sp-Block

Dual-Block

Derma

Year

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009

Worldwide distribution countries

1 2 8 12 19 28 41

Publications on international journals

history of the OsteoBiol® by Tecnoss brand

Putty

Duo-Teck

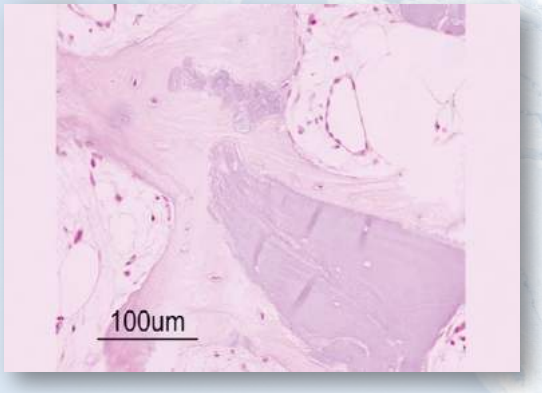
Evolution

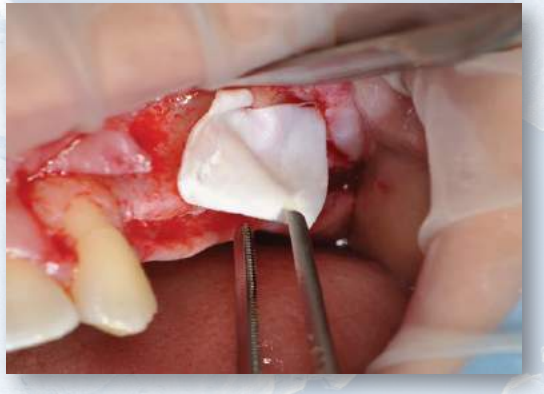
mp3®

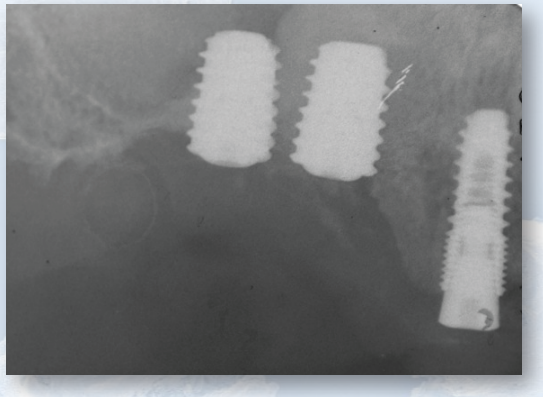
TSV Gel

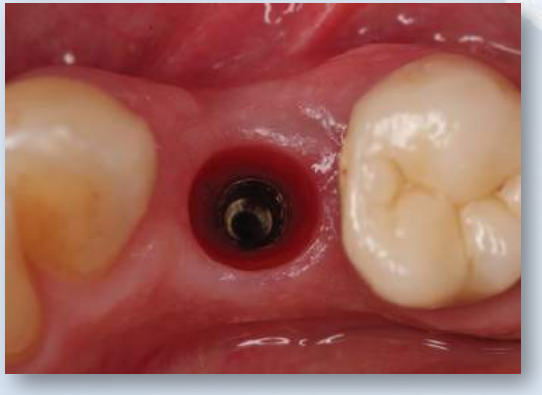
2010 2011 2012 2013 2014 2015 2016 2017 2018

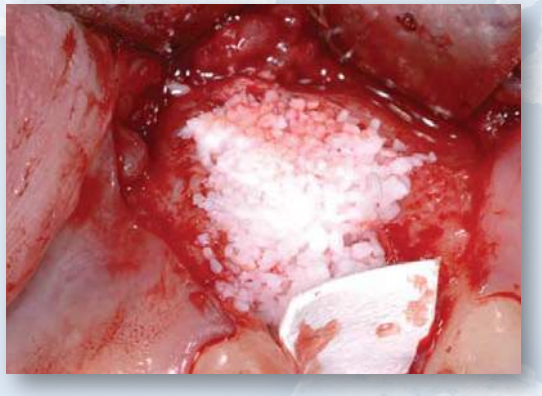
CLINICAL CASES

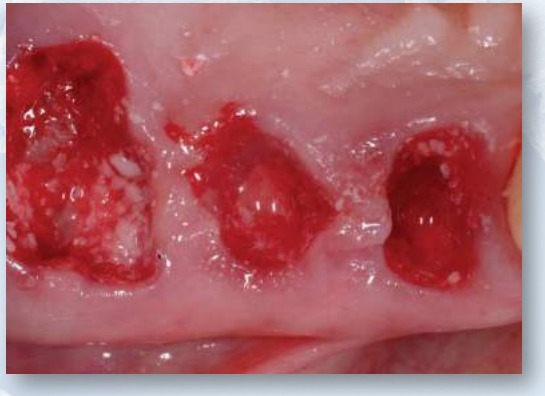


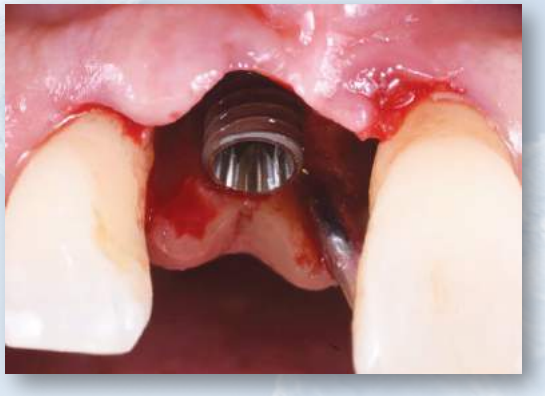












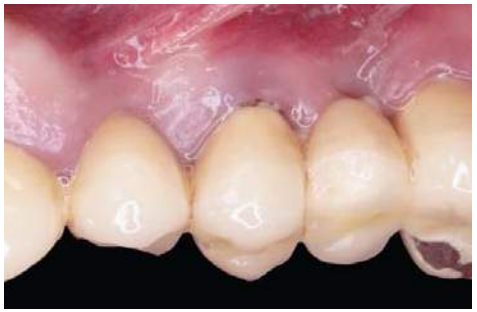


Fig. 1

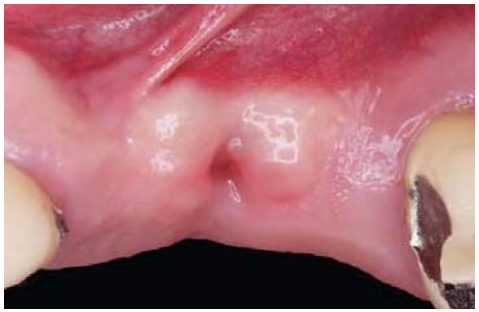


Fig. 2

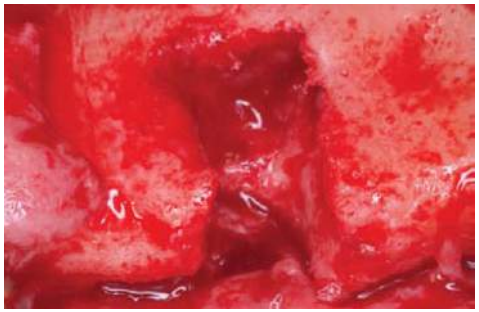


Fig. 3

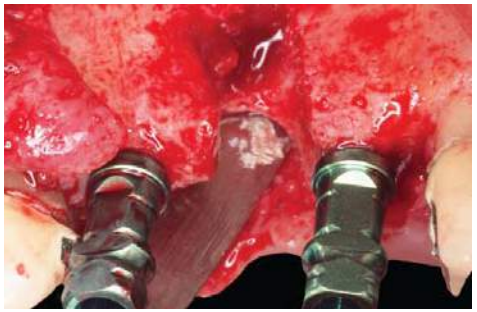


Fig. 4


Fig. 5

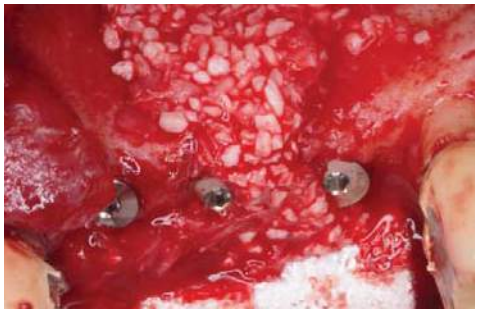


Fig. 6

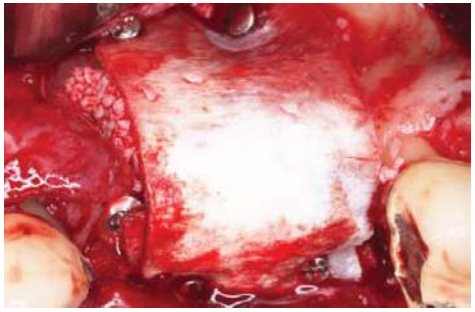


Fig. 7

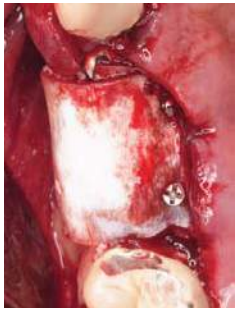
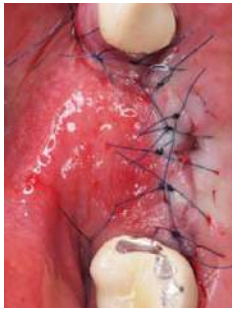



Fig. 8

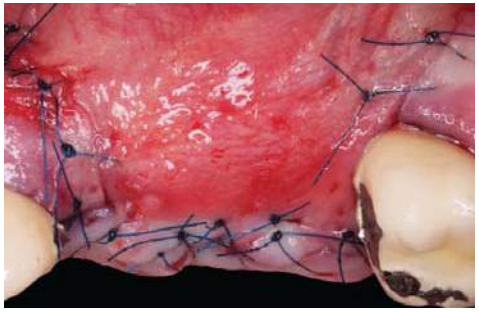


Fig. 9

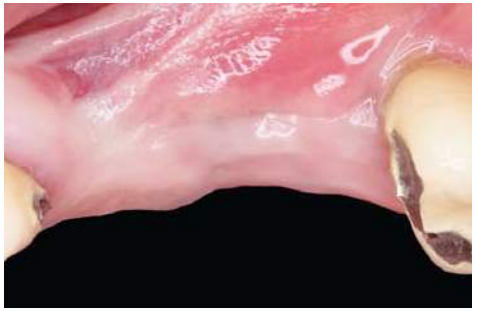


Fig. 10

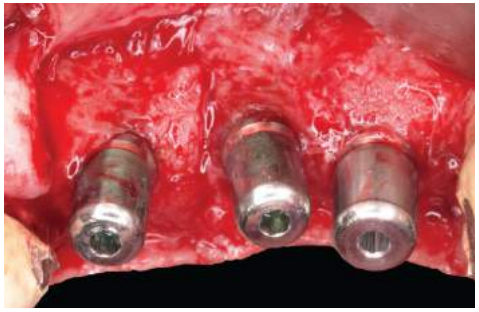


Fig. 11

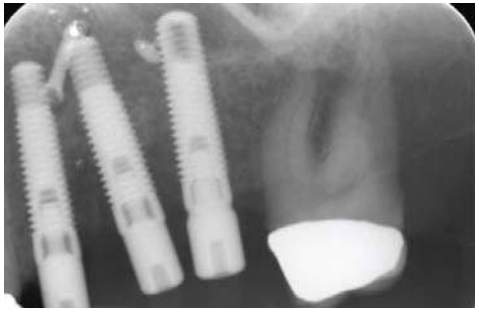


Fig. 12

Sex: **female** | Age: **49**

Fig. 1 Preoperative image

Fig. 2 After the extraction, the deficit of soft tissue and bony tissue are evident

Fig. 3 Intraoperative image: vertical defect in 2.4

Fig. 4 Implant placement in 2.3 and 2.5, close to the bone defect

Fig. 5 Implant placement in 2.4, with exposure of 14 threads

Fig. 6 Treatment of the defect with OsteoBiol® *Apatos* mixed with autologous bone

Fig. 7 Placement of OsteoBiol® *Cortical Lamina* to avoid the collapse of the vertical defect

Fig. 8 Detail (occlusal view) of the bone regeneration with *Apatos* and *Lamina* and suture with PP 5/0

Fig. 9 Primary closure of the wound from the vestibular side

Fig. 10 Detail of the treated area at 8 months

Fig. 11 Complete bone regeneration of the vertical defect

Fig. 12 Periapical x-ray

Documentation provided by
Dr **Antonio Murillo Rodriguez**
Ponferrada, Spain
email: dr_murillorodriguez@yahoo.es

Bone substitute: **OsteoBiol® *Apatos***
For more information on OsteoBiol® *Apatos* see page 44

Barrier: **OsteoBiol® *Lamina***
For more information on OsteoBiol® *Lamina* see page 66

Case report Ridge bone volumetric reconstruction with *mp3*®

Sex: **female** | Age: **47**

Fig. 1 X-ray of the first upper premolar showing a periapical bone loss

Fig. 2 Clinical intra-operative view showing the large alveolar bone deficit around the upper premolar

Fig. 3 Clinical intra-operative view showing the bone deficit after tooth extraction

Fig. 4 Clinical intra-operative view during the *mp3*® grafting stage

Fig. 5 Primary soft tissue closure of the muco-periosteal flap after its coronal positioning

Fig. 6 Occlusal view of the soft tissue healing 6 months after the intervention

Fig. 7 Vestibular view of the soft tissue healing 6 months after the intervention

Fig. 8 Vestibular view of the implant positioned in the regenerated bone

Fig. 9 Occlusal view of the implant positioned in the regenerated bone. Note how the correct hard tissue profile has been regenerated in order to support the soft tissues

Fig. 10 Clinical view showing the final prosthetic rehabilitation 3 months after the implant positioning

Documentation provided by
Prof **Antonio Barone**
DDS, PhD, MSc
University of Geneva, Switzerland
e-mail: barosurg@gmail.com

Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 32

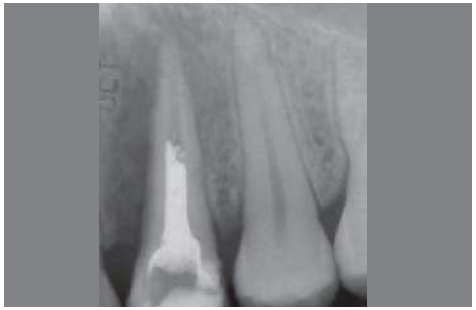


Fig. 1

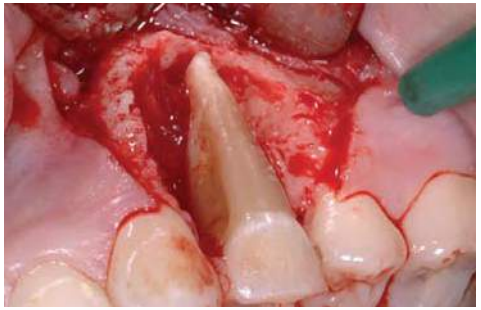


Fig. 2

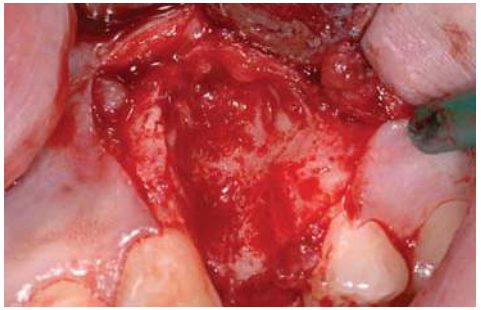


Fig. 3

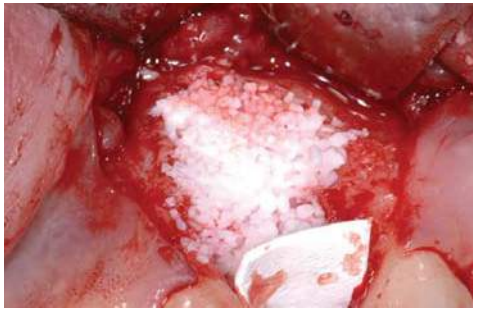


Fig. 4

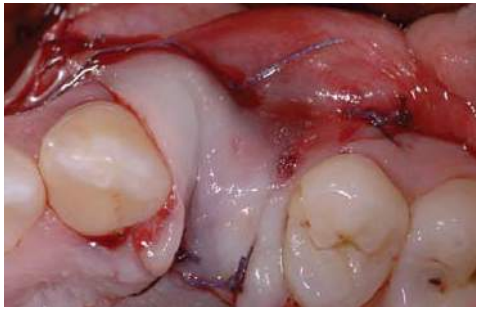


Fig. 5

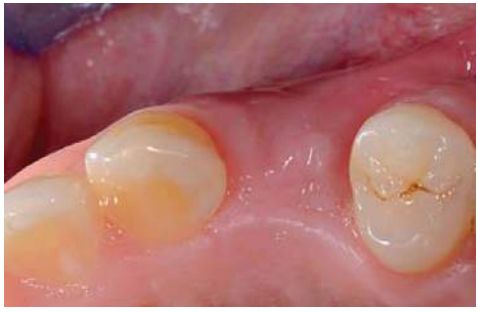


Fig. 6

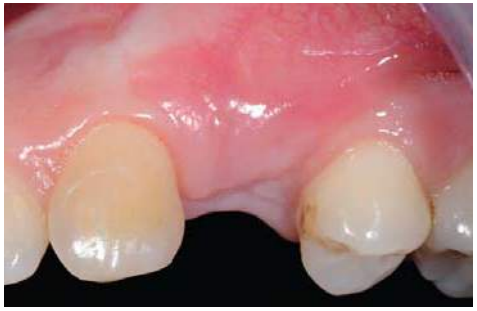


Fig. 7

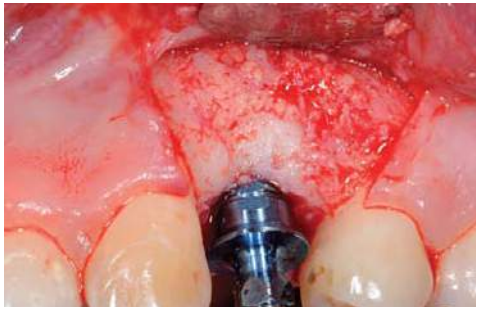


Fig. 8

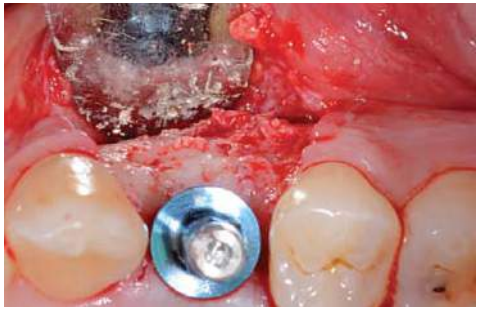


Fig. 9

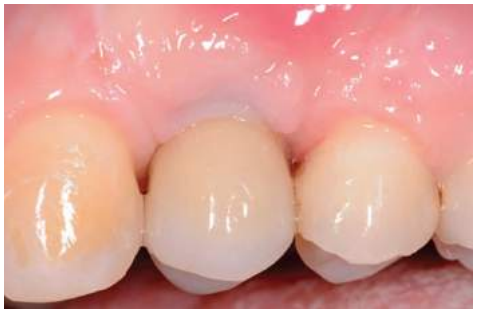


Fig. 10

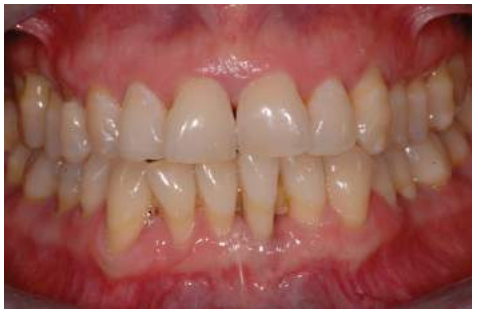


Fig. 1

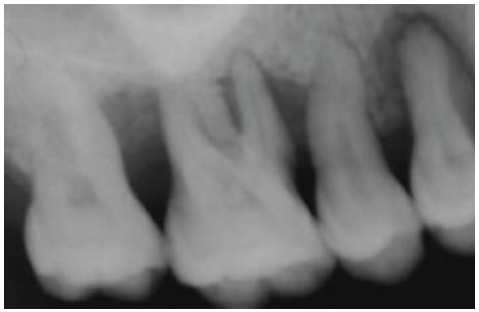


Fig. 2

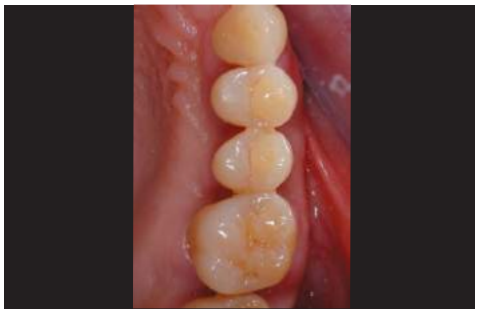


Fig. 3

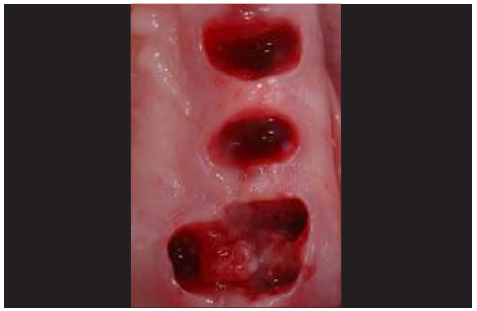


Fig. 4

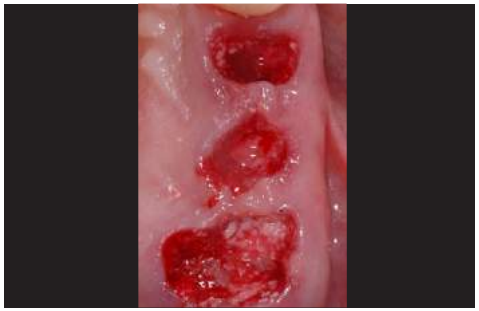


Fig. 5

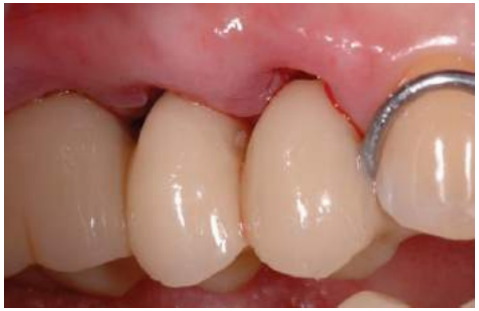


Fig. 6

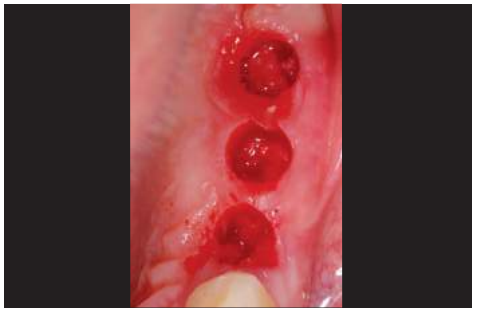


Fig. 7


Fig. 8

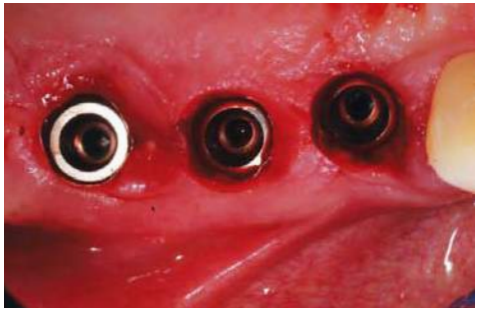
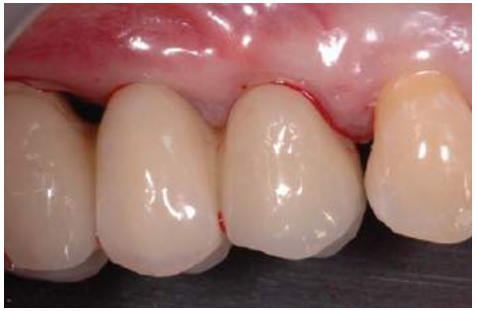
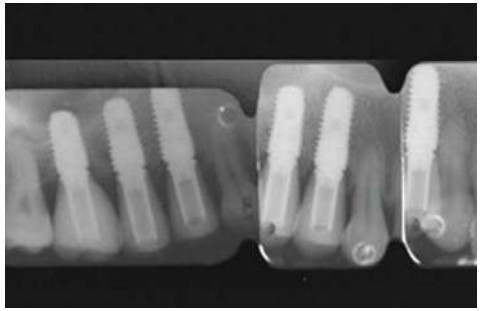
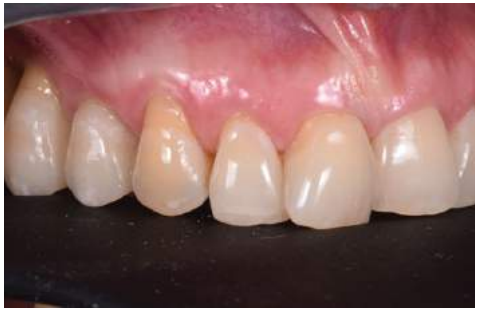


Fig. 9







Sex: **female** | Age: **34**

Fig. 1 Initial situation

Fig. 2 Pre-op x-ray

Fig. 3 Occlusal view

Fig. 4 Sockets after the extraction

Fig. 5 Sockets filled with OsteoBiol® *mp3*®

Fig. 6 Provisional prosthetic to protect the graft

Fig. 7 Mucotomy before the guided surgery procedure

Fig. 8 Guided implant surgery (at 6 months)

Fig. 9 Implants positioned

Fig. 10 Final restoration

Fig. 11 X-ray after 8 years

Fig. 12 Clinical situation after 8 years

Documentation provided by
Dr **Roberto Rossi**
M.Sc.D. in Periodontology, Genova, Italy
e-mail: drrossi@mac.com

Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 32

Case report Regeneration of a peri-implant defect

Sex: **female** | Age: **41**

Fig. 1 Initial situation

Fig. 2 OsteoBiol® *Gen-Os*® grafted to treat the peri-implant defect

Fig. 3 Graft protection with OsteoBiol® *Derma*

Fig. 4 Final situation showing the regenerated bone

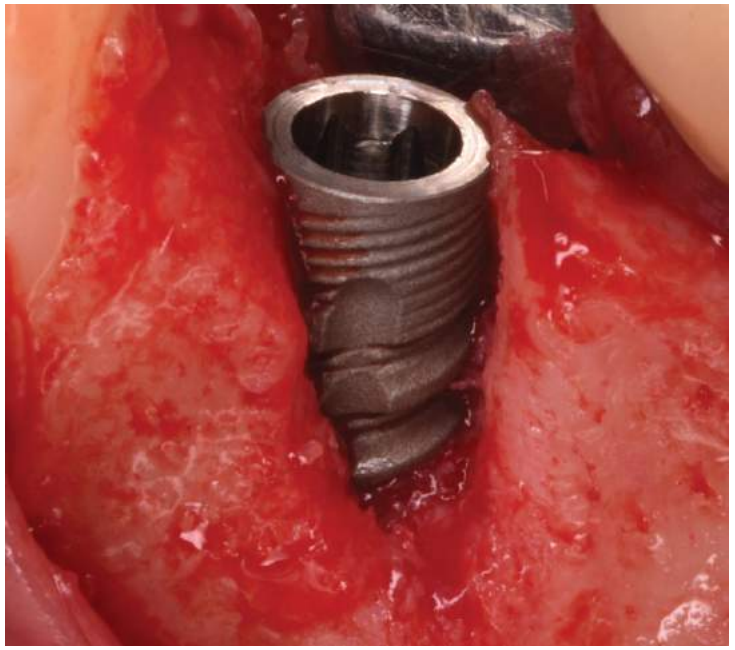


Fig. 1

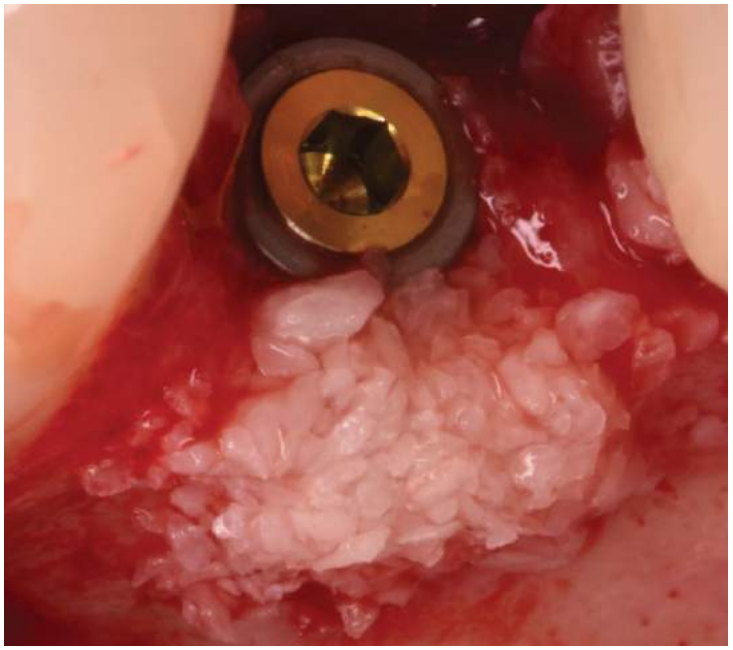


Fig. 2

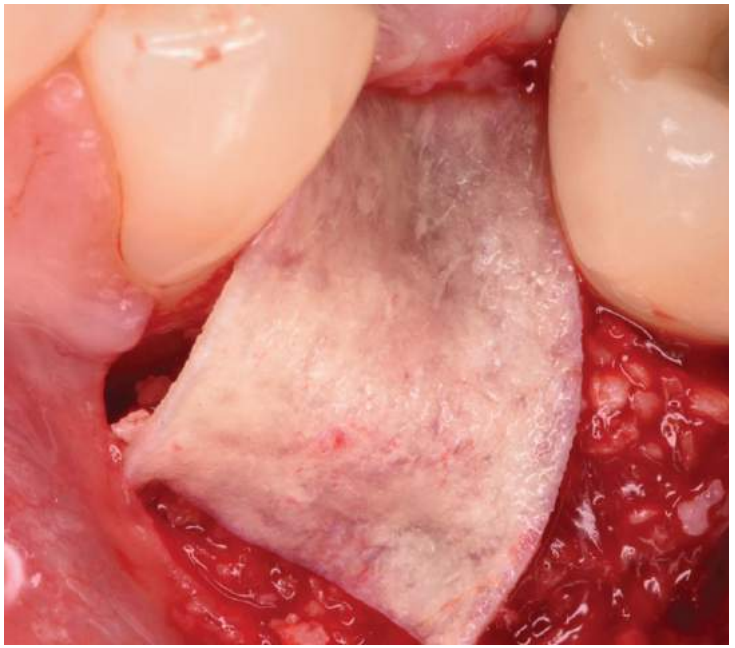


Fig. 3

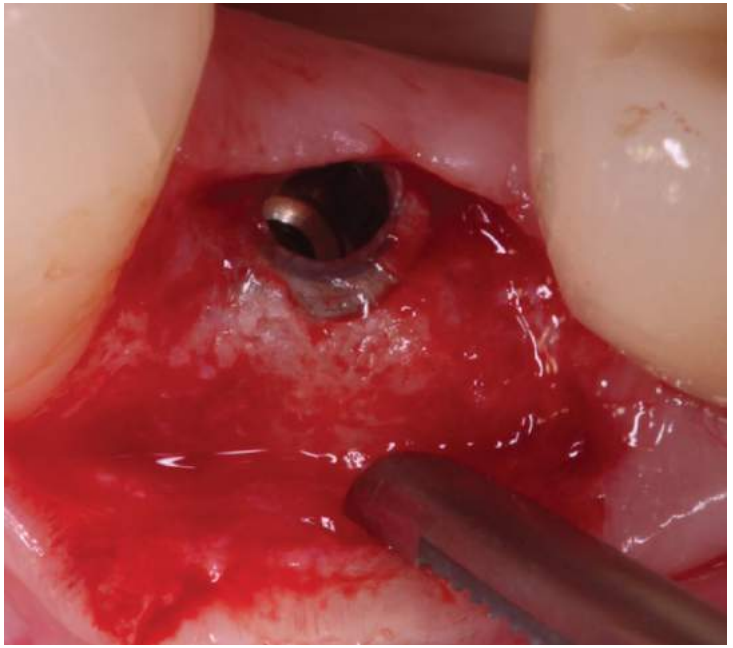


Fig. 4

Documentation provided by
Dr **Antonio Murillo Rodriguez**
Ponferrada, Spain
email: dr_murillorodriguez@yahoo.es

Bone substitute: **OsteoBiol® *Gen Os*®**
For more information on OsteoBiol® *Gen Os*® see page 24

Membrane: **OsteoBiol® *Derma***
For more information on OsteoBiol® *Derma* see page 62


Fig. 1

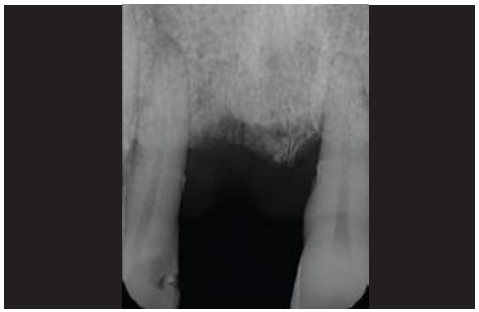


Fig. 2

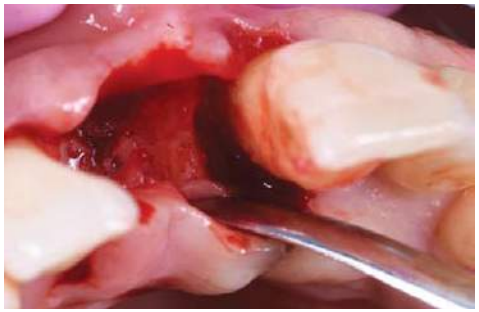


Fig. 3

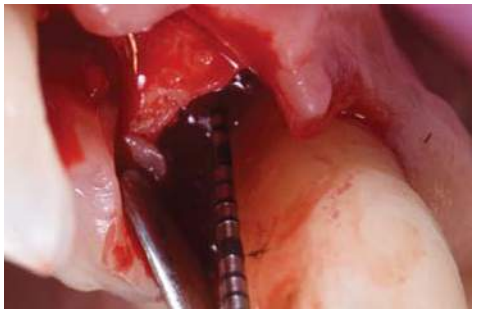


Fig. 4

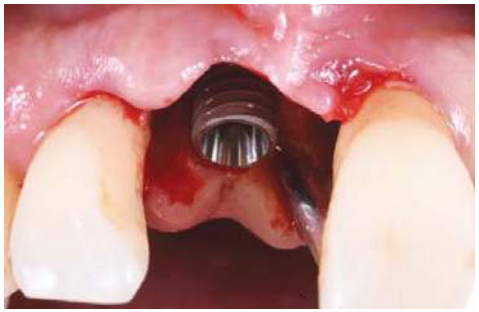


Fig. 5

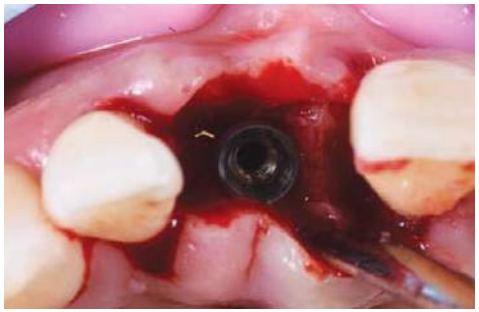


Fig. 6

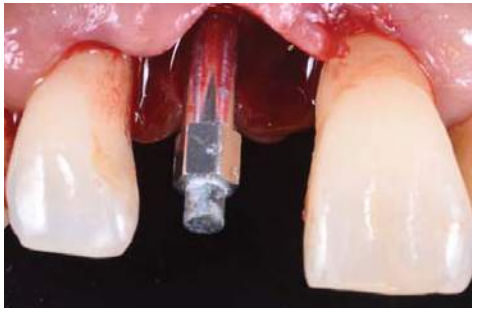


Fig. 7


Fig. 8

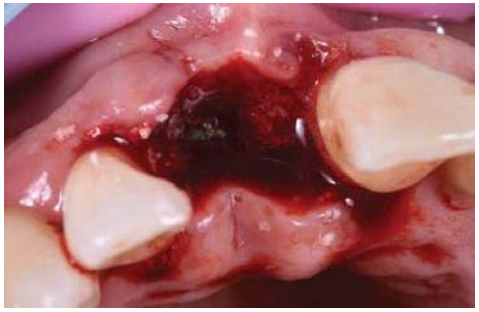


Fig. 9

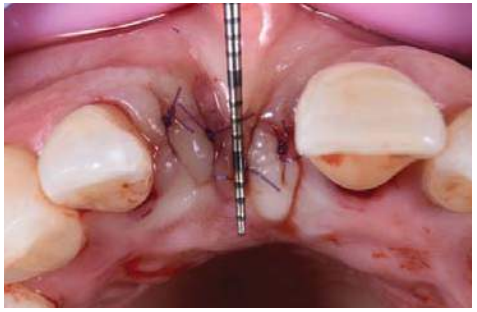


Fig. 10

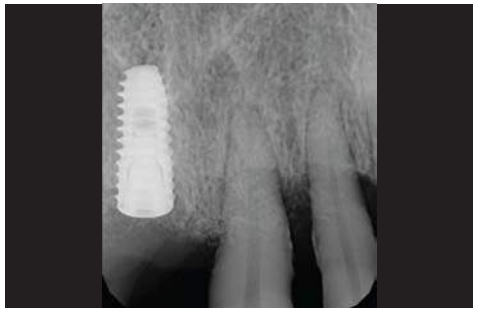


Fig. 11

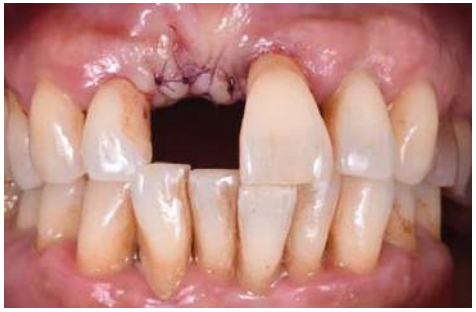


Fig. 12

Sex: **female** | Age: **50**

Fig. 1 Initial clinical situation

Fig. 2 Initial x-ray

Fig. 3 Flap opening

Fig. 4 Flap opening

Fig. 5 Implant insertion

Fig. 6 Implant insertion (occlusal view)

Fig. 7 Check of the alignment

Fig. 8 OsteoBiol *Gen-Os*® mixed with *TSV Gel*

Fig. 9 OsteoBiol *Gen-Os*® + *TSV Gel* grafting in the defect site

Fig. 10 Flap suture and measurement of the horizontal width

Fig. 11 Post-operative x-ray

Fig. 12 Final result

Documentation provided by
Dr **Roberto Rossi**
M.Sc.D. in Periodontology, Genova, Italy
e-mail: drrossi@mac.com

Bone substitute: **OsteoBiol® *Gen-Os®* + *TSV Gel***
For more information on OsteoBiol® *Gen-Os®* see page 24
For more information on OsteoBiol® *TSV Gel* see page 28

Case report Sinus lift with crestal access

Sex: **male** | Age: **60**

Fig. 1 Sinus imaging with TC

Fig. 2 3D image of the area

Fig. 3-4 Dental scans

Fig. 5 Preparation of the grafting sites

Fig. 6 Crestal access sinus lift with OsteoBiol® *Gel 40*

Fig. 7 Post-operative x-ray

Fig. 8 Control x-ray at 12 months

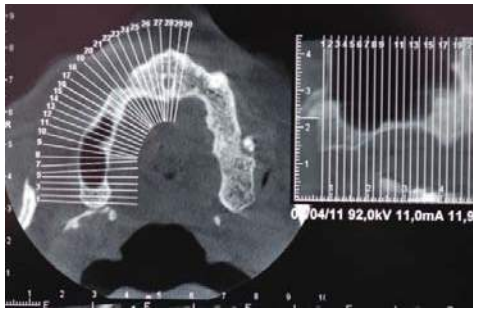


Fig. 1

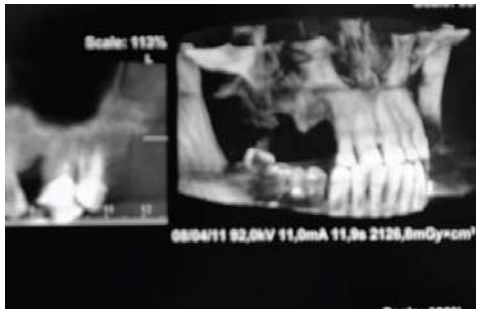


Fig. 2

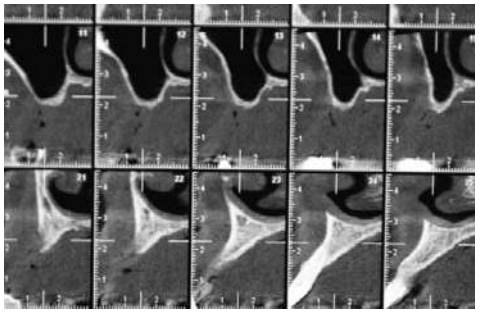


Fig. 3

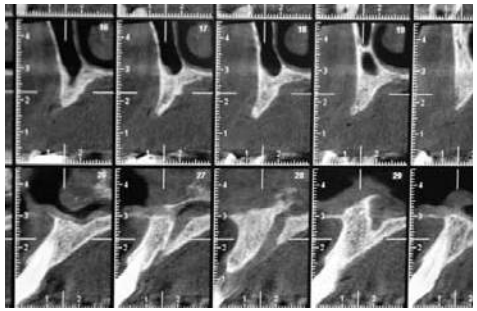


Fig. 4

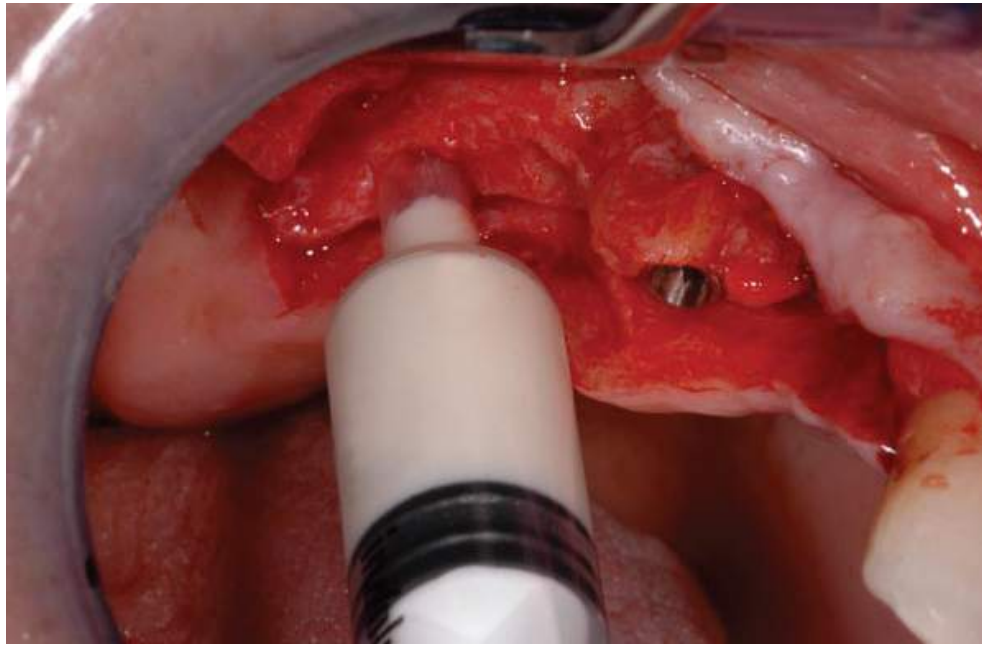


Fig. 6

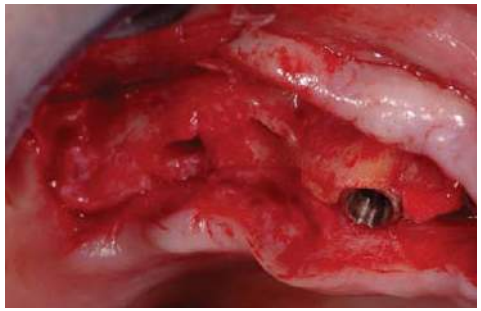


Fig. 5

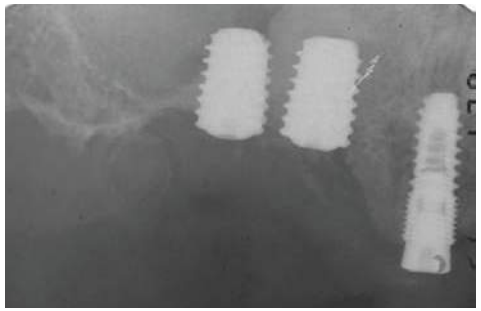


Fig. 7

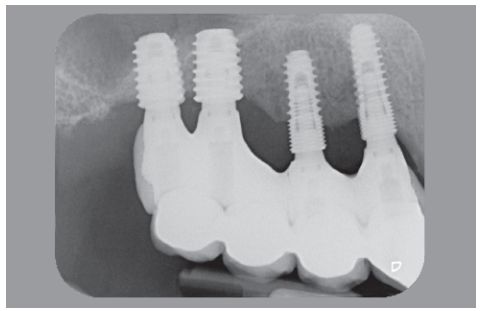


Fig. 8

Documentation provided by
Dr **Roberto Rossi**
M.Sc.D. in Periodontology, Genova, Italy
e-mail: drrossi@mac.com

Bone substitute: **OsteoBiol® *Gel 40***
For more information on OsteoBiol® *Gel 40* see page 40

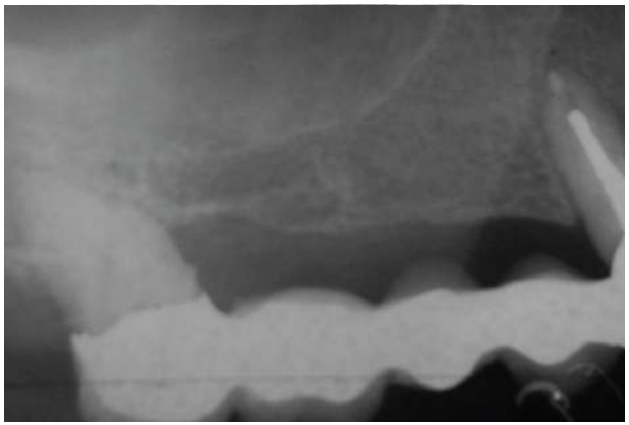


Fig. 1

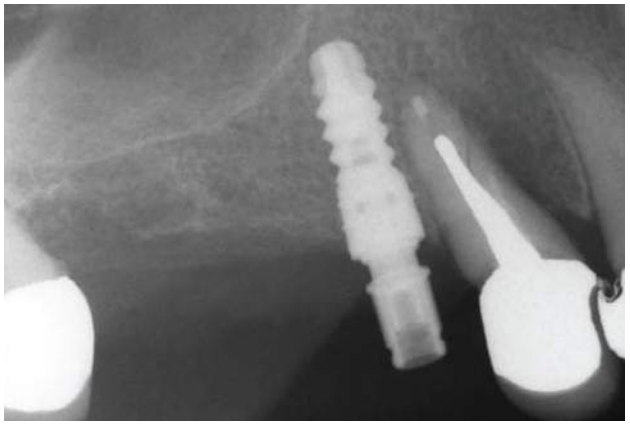


Fig. 2

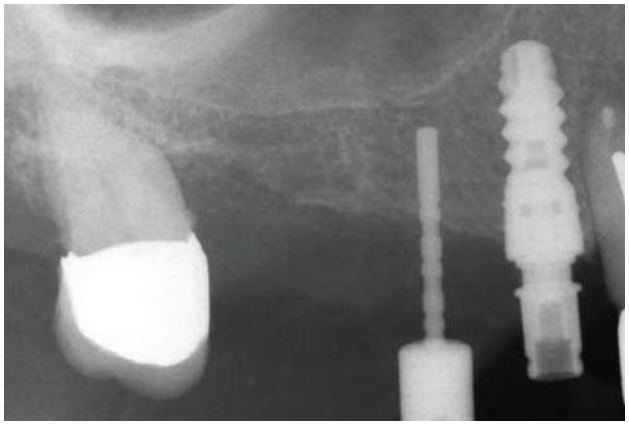


Fig. 3

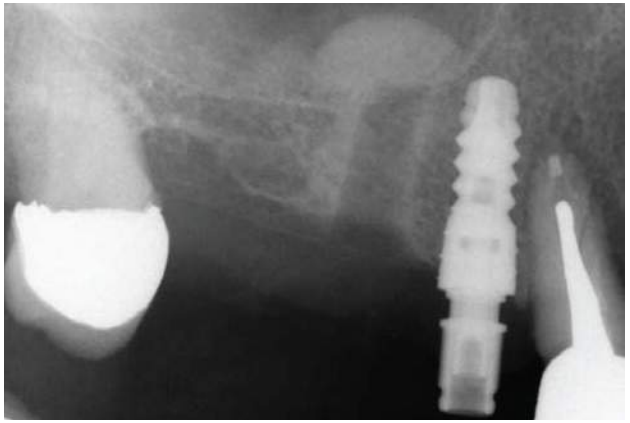


Fig. 4

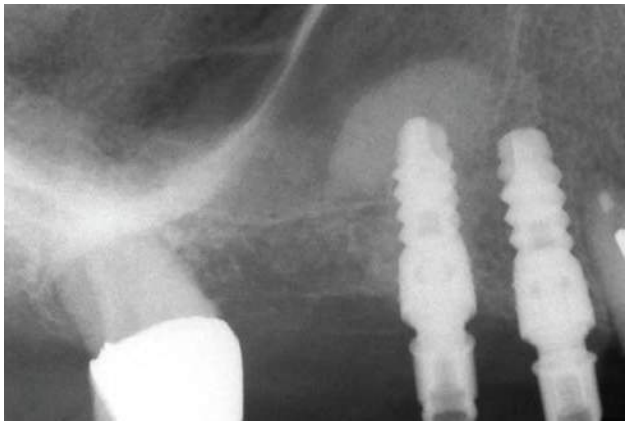


Fig. 5

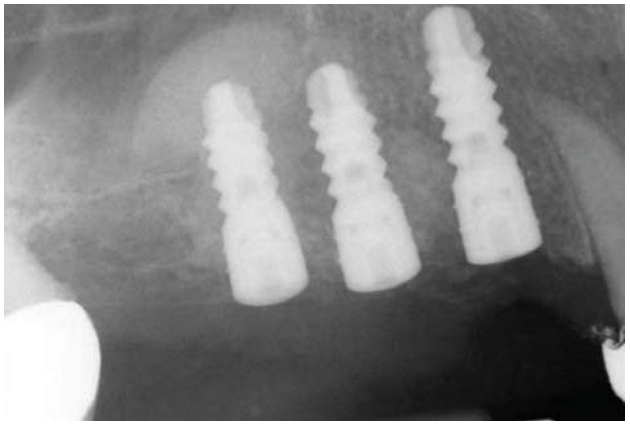


Fig. 6

CRESTAL ACCESS SINUS LIFT

Sex: **female** | Age: **43**

Fig. 1 Initial x-ray

Fig. 2 Control x-ray before osteotomy

Fig. 3 Measuring before osteotomy

Fig. 4 Maxillary sinus lifted with OsteoBiol® *Putty*

Fig. 5 Implant placed in the grafted site: final x-ray

Fig. 6 Implant placed in the grafted site: final x-ray

Documentation provided by
Dr **Roberto Rossi**
M.Sc.D. in Periodontology, Genova, Italy
e-mail: drrossi@mac.com

Bone substitute: **OsteoBiol® *Putty***
For more information on OsteoBiol® *Putty* see page 36

Case report Sinus floor elevation with lateral approach

Sex: **male** | Age: **52**

Fig. 1 Initial x-ray. Teeth 2.5 and 2.6 missing for 2 years, residual bone height is 3-5 mm below the maxillary sinus

Fig. 2 Flap opening

Fig. 3 Antrostomy opening and lifting

Fig. 4 Antrostomy opening and lifting

Fig. 5 Lifting of the intact Schneider membrane

Fig. 6 Direction indicators

Fig. 7 Sinus grafting with OsteoBiol® *mp3*®

Fig. 8 Implants in situ

Fig. 9 Bone packing

Fig. 10 Graft protection with OsteoBiol® *Evolution*

Fig. 11 Sutures

Fig. 12 Final x-ray

Documentation provided by
Dr **Irfan Abas**
Private practitioner in Amsterdam, Netherlands
e-mail: irfan.abas@gmail.com

Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 32

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 58

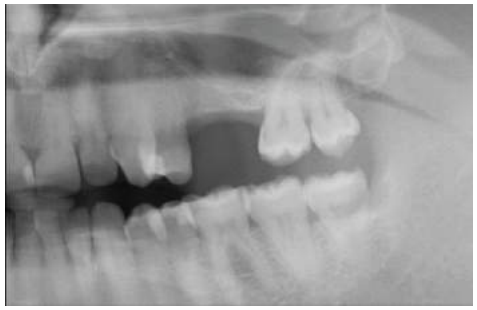


Fig. 1

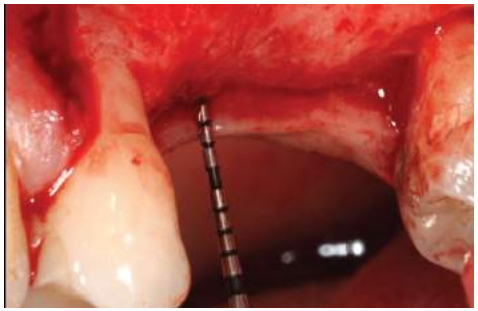


Fig. 2

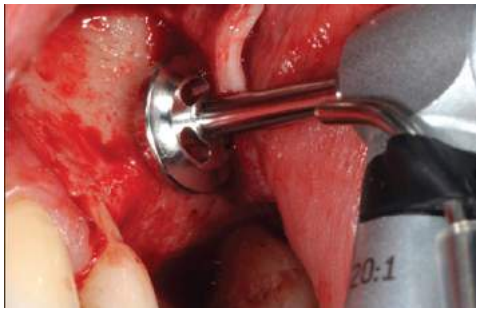


Fig. 3

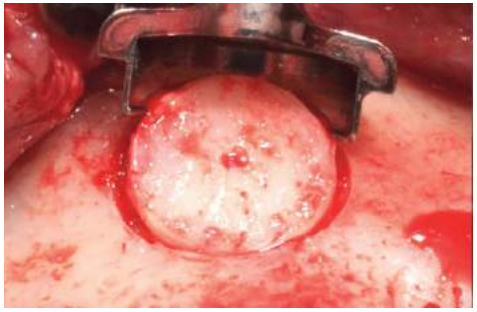


Fig. 4

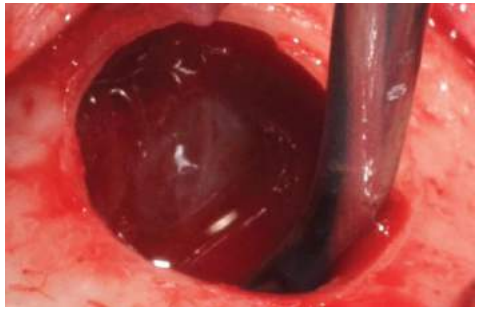


Fig. 5

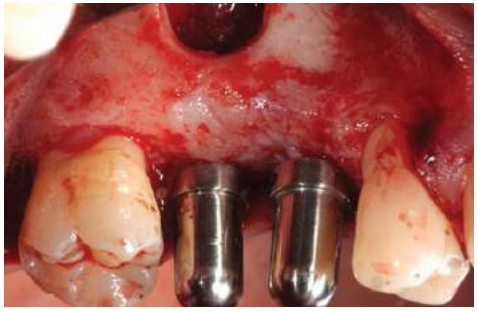


Fig. 6

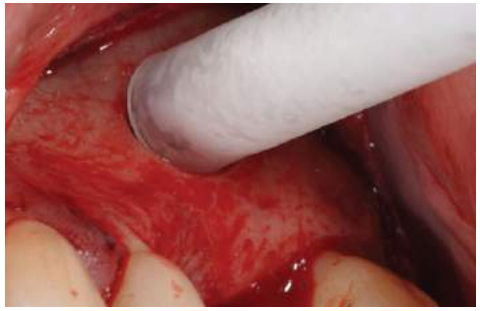


Fig. 7

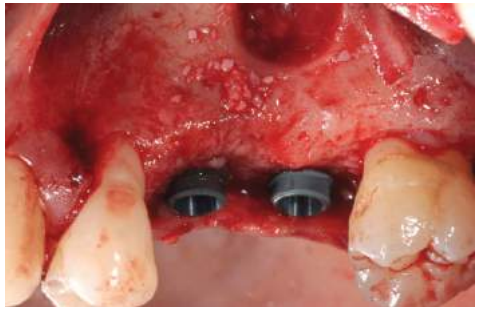


Fig. 8

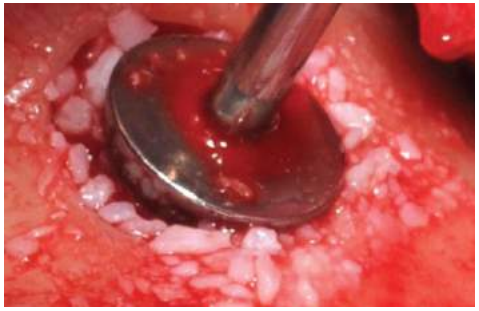


Fig. 9

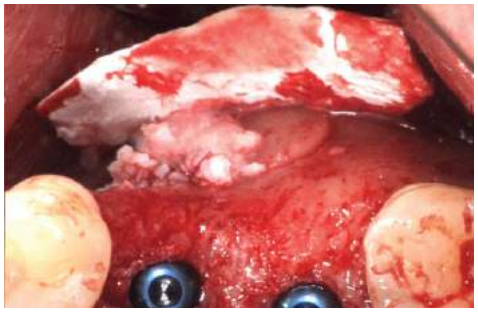


Fig. 10

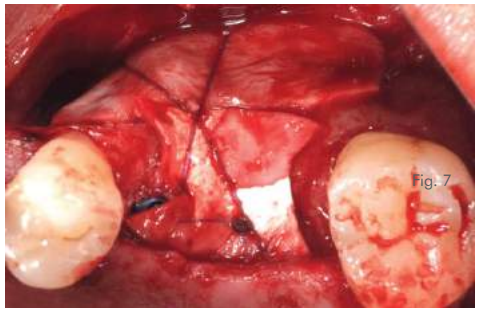


Fig. 11

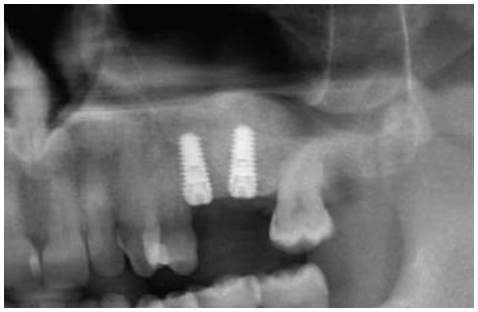


Fig. 12

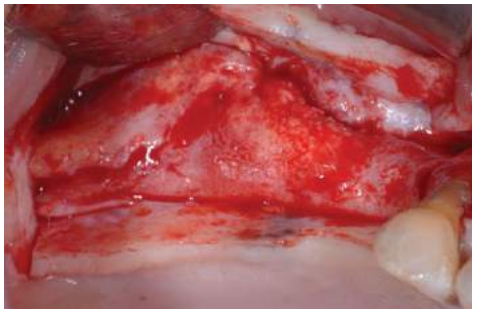


Fig. 1

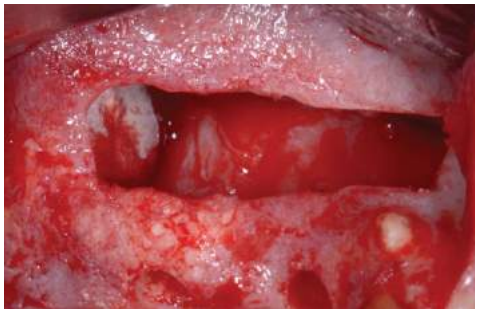


Fig. 2

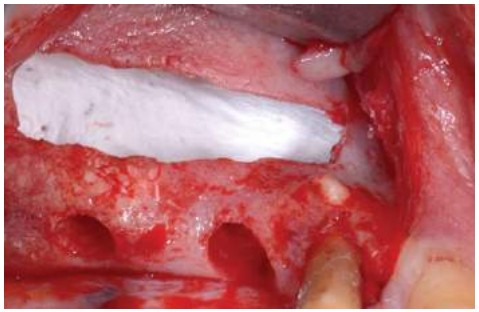


Fig. 3

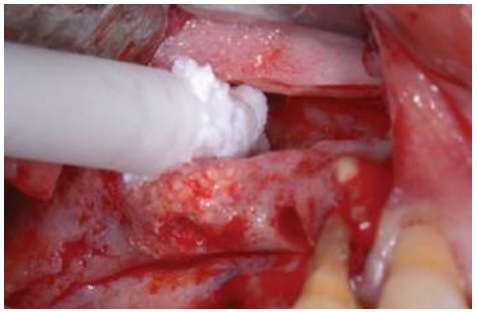


Fig. 4

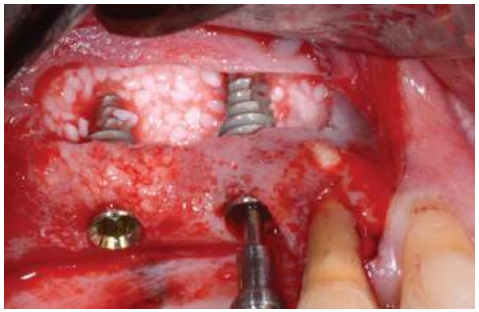


Fig. 5

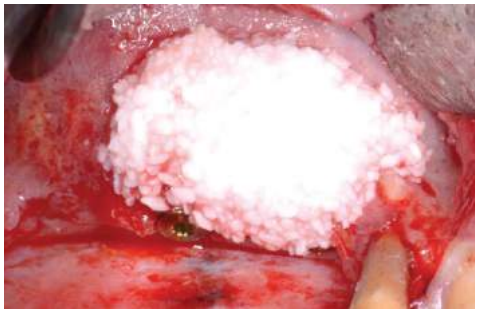


Fig. 6

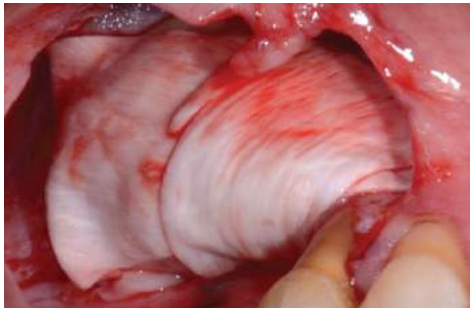


Fig. 7

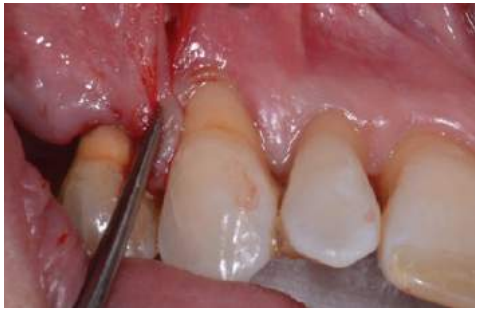


Fig. 8

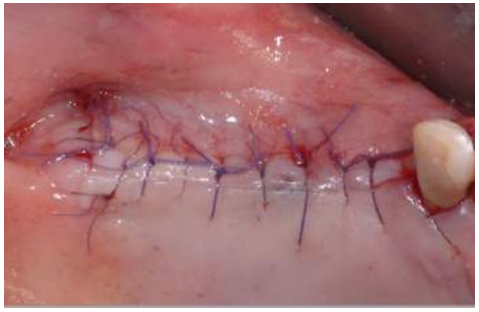


Fig. 9

LATERAL ACCESS SINUS LIFT

Sex: **male**

Fig. 1 Flap opening

Fig. 2 Osteotomy

Fig. 3 Schneider membrane protection with OsteoBiol® *Evolution* (fine model)

Fig. 4 OsteoBiol® *mp3*® grafting inside the maxillary sinus

Fig. 5 Implant insertion

Fig. 6 Grafting and packing of OsteoBiol® *mp3*® to support the maxillary contour

Fig. 7 OsteoBiol® *Evolution* to protect the bone graft

Fig. 8 Flap closure

Fig. 9 Sutures

Documentation provided by
Prof **Tiziano Testori**
MD, DDS, FICD
Como, Italy
e-mail: info@tiziano-testori.it

Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 32

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 58

Case report Lateral access sinus lift with simultaneous implant and horizontal augmentation

Sex: **female** | Age: **42**

Fig. 1 Initial x-ray showing a 3 mm in height residual bone

Fig. 2 Flap opening, a substantial vestibular bone resorption can be determined

Fig. 3 Antrostomy performed with Piezosurgery technique

Fig. 4 A OsteoBiol® *Evolution* membrane is inserted through the antrostomy to protect the Schneider membrane from the grafting material

Fig. 5 Maxillary sinus grafted with OsteoBiol® *mp3*®

Fig. 6 Immediate implant placement

Fig. 7 An OsteoBiol® *Evolution* membrane is stabilized with osteosynthesis screws above the antrostomy

Fig. 8 Cortical bone stimulation

Fig. 9 OsteoBiol® *mp3*® is grafted on the vestibular side of the defect for horizontal augmentation

Fig. 10 The OsteoBiol® *Evolution* membrane is stabilised into position with a transpalatal suture

Fig. 11 Final situation

Fig. 12 Post-operative x-ray

Documentation provided by
Dr **Rosario Sentineri**
Private practitioner in Genova, Italy
e-mail: rosario.sentineri@gmail.com

Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 32

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 58

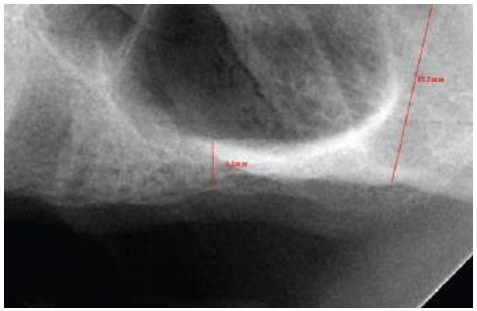


Fig. 1

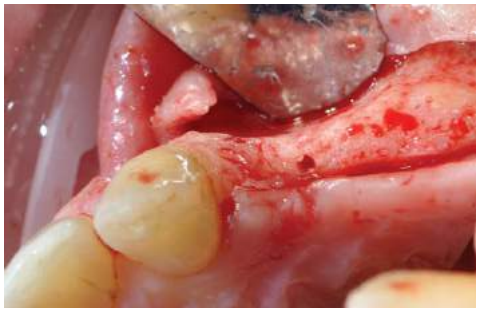


Fig. 2

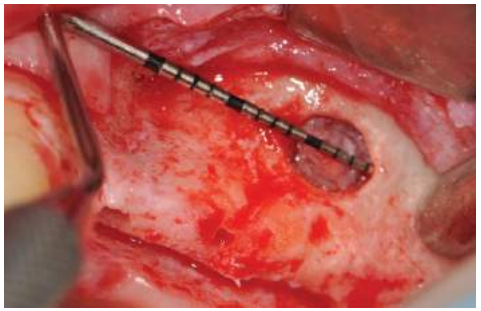


Fig. 3

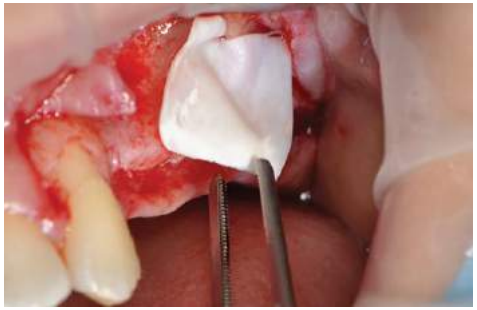


Fig. 4

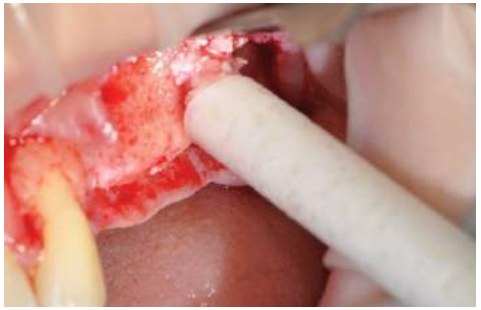


Fig. 5

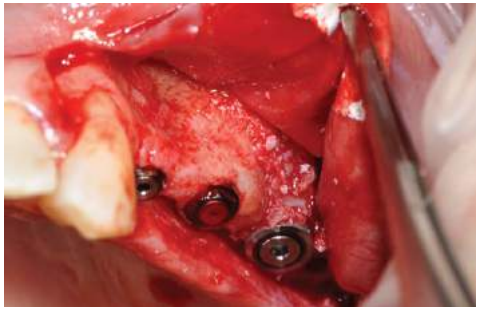


Fig. 6

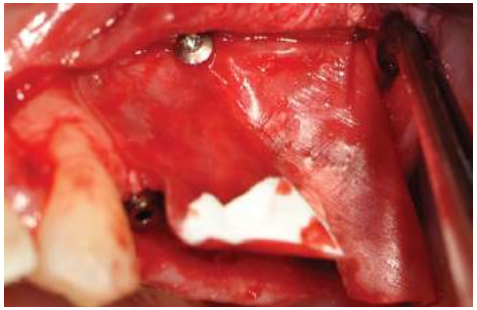


Fig. 7

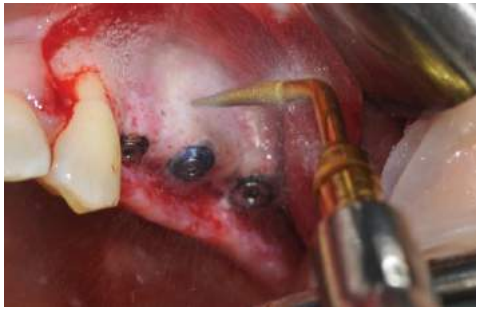


Fig. 8

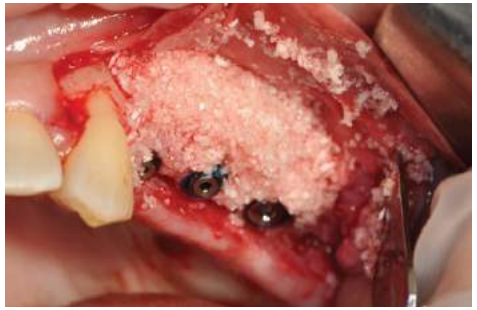


Fig. 9

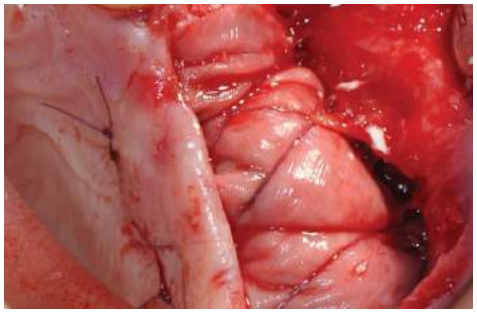


Fig. 10

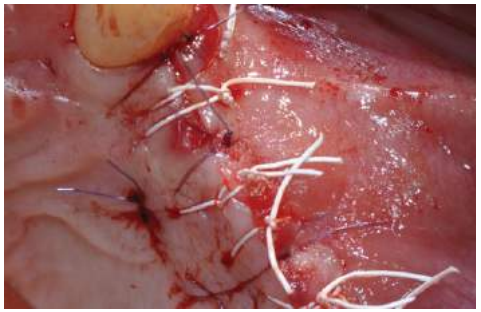


Fig. 11

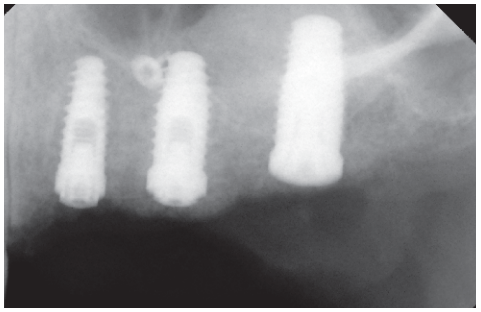


Fig. 12

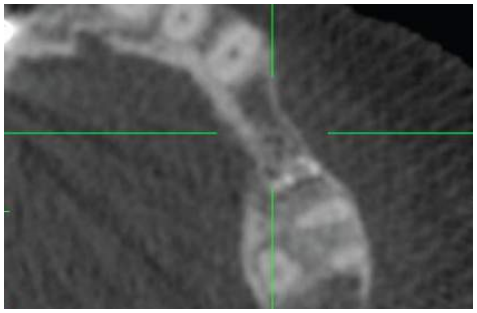


Fig. 1

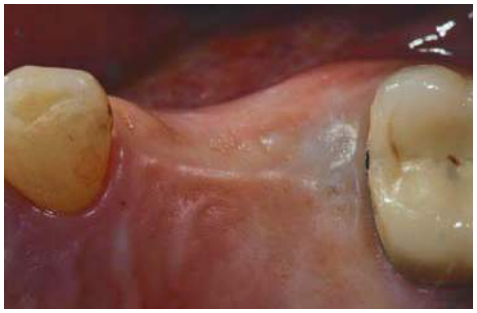


Fig. 2

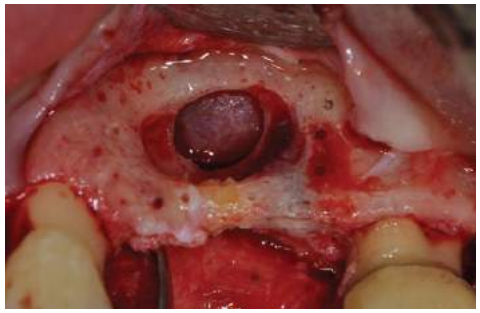


Fig. 3

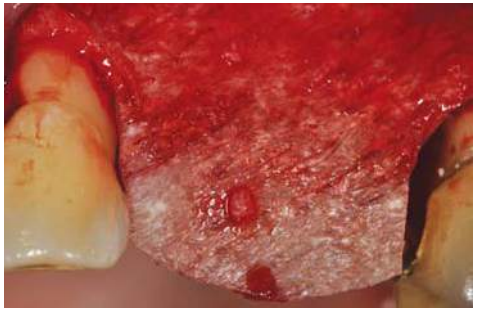


Fig. 4

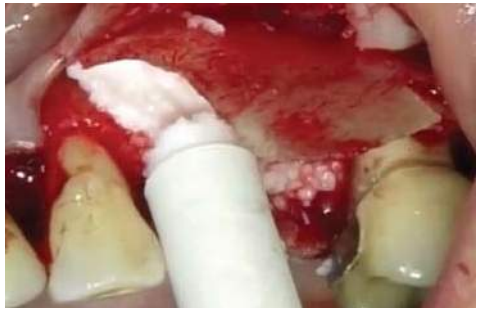


Fig. 5

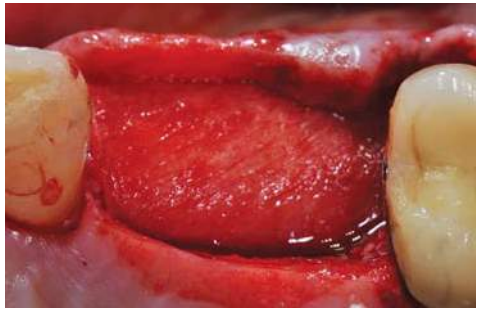


Fig. 6


Fig. 7

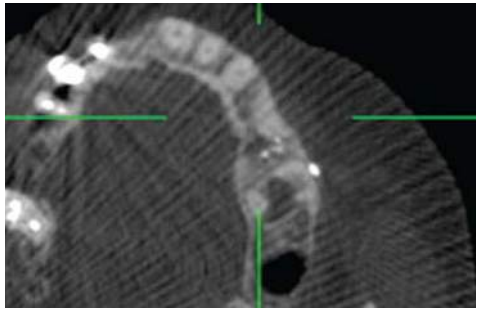


Fig. 8

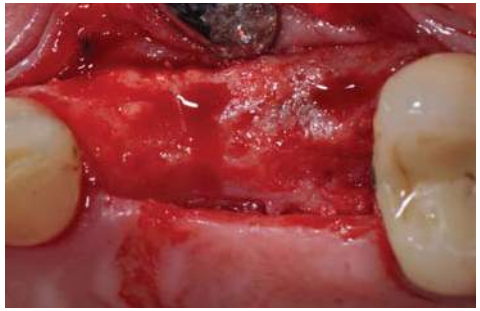


Fig. 9

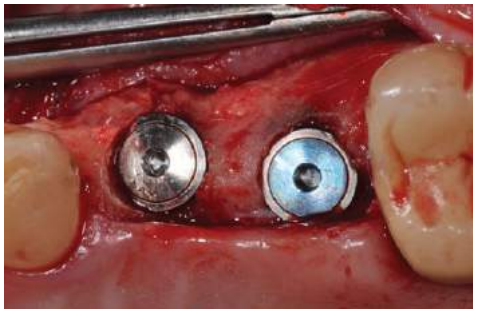


Fig. 10

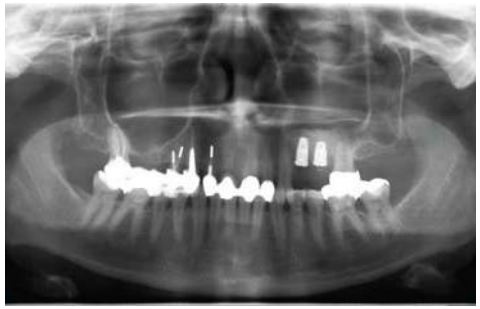


Fig. 11

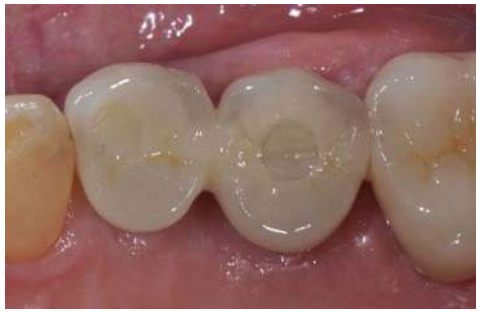


Fig. 12

Sex: **female** | Age: **45**

Fig. 1 Preoperative cone beam scan

Fig. 2 Alveolar ridge presenting an inadequate width for implant placement

Fig. 3 Intraoperative view demonstrating the alveolar defect. Due to the limited vertical and horizontal dimension the elevation of the sinus has been performed

Fig. 4 Fixation of OsteoBiol® *Cortical Lamina* with titanium pins performed prior to ridge augmentation

Fig. 5 Reconstruction of the alveolar ridge with OsteoBiol® *mp3*®

Fig. 6 Covering the augmented area with OsteoBiol® *Lamina*

Fig. 7 Primary flap closure was achieved

Fig. 8 Digital volume tomography 6 months after augmentation procedure demonstrates the amount of new bone

Fig. 9 Intraoperative view of the augmented area six months after augmentation procedure

Fig. 10 Placement of two implants

Fig. 11 Postoperative radiograph

Fig. 12 Final prosthetic reconstruction

Documentation provided by
Prof Dr **Hannes Wachtel**
Dr **Tobias Thalmair**
Private Institute for Periodontology and Implantology, Munich, Germany
Email: hannes@wachtel.biz

Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 32

Barrier: **OsteoBiol® *Lamina***
For more information on OsteoBiol® *Lamina* see page 66

Case report Extensive horizontal augmentation with *mp3*® graft and *Lamina*

Sex: **female** | Age: **33**

Fig. 1-2 At preoperative planning with a DVT the thin alveolar ridge in the area 1.2 is visible

Fig. 3 Pre-operative clinical view of the buccal alveolar atrophy

Fig. 4 Intra-operative view of a 3,4 mm implant with a "bone bridge" in the area of the implant head and the main part of the implant body outside of the bony envelope

Fig. 5 GBR Type covering of the exposed implant area with a OsteoBiol® *Lamina* and *mp3*®; the *Lamina* is fixated with pins

Fig. 6 View of the augmented area 6 months post augmentation

Fig. 7-8 Healing abutment, uncovering with partially inverted CTG procedure to additionally augment the buccal soft tissue

Fig. 9 Final result with cemented full porcelain crowns on the neighboring teeth and a full porcelain screwed on crown on 1.2

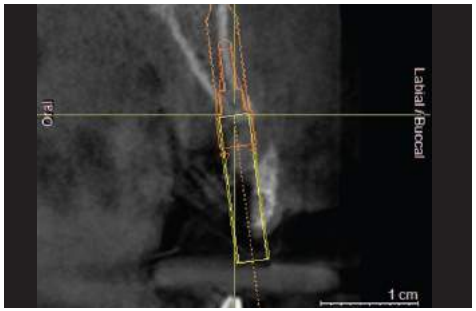


Fig. 1

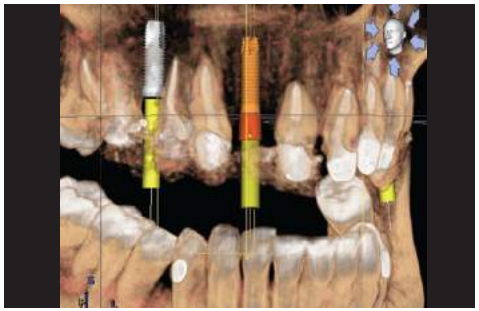


Fig. 2

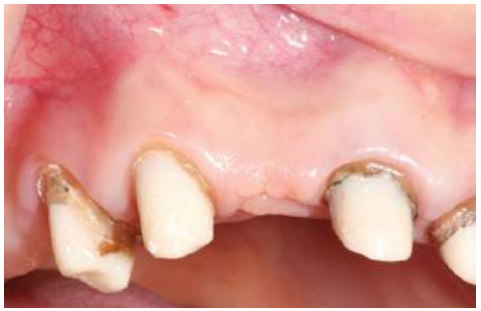


Fig. 3

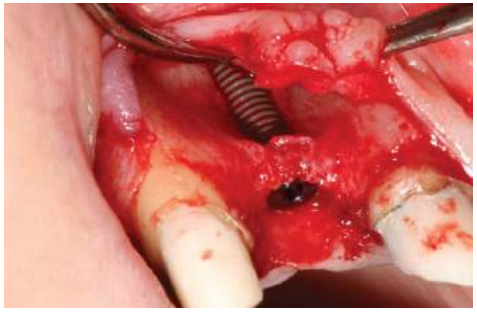


Fig. 4

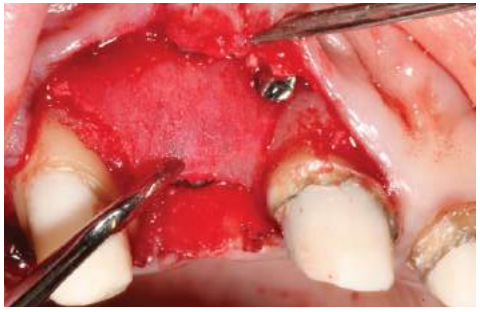


Fig. 5


Fig. 6


Fig. 7

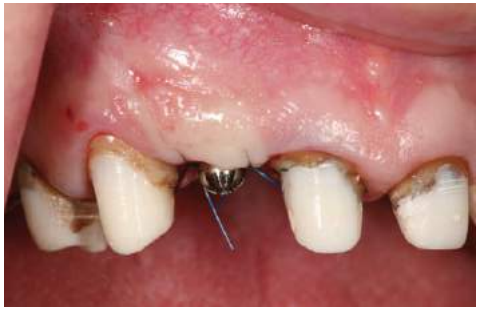


Fig. 8

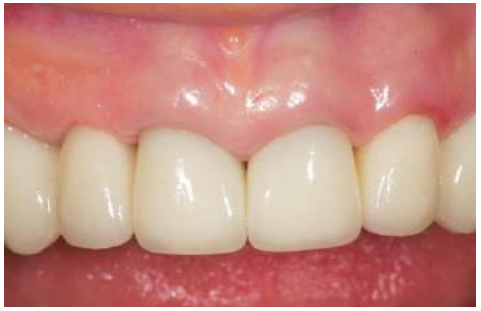


Fig. 9

Documentation provided by
Prof **Michael Weinländer**
Wien, Austria
e-mail: office@drweinlaender.at

Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 32

Barrier: **OsteoBiol® *Lamina***
For more information on OsteoBiol® *Lamina* see page 66

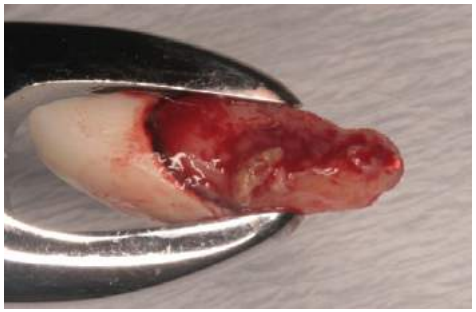


Fig. 1

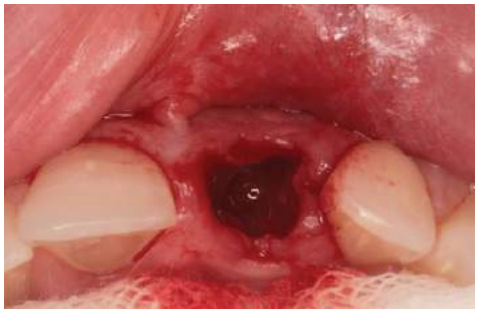


Fig. 2

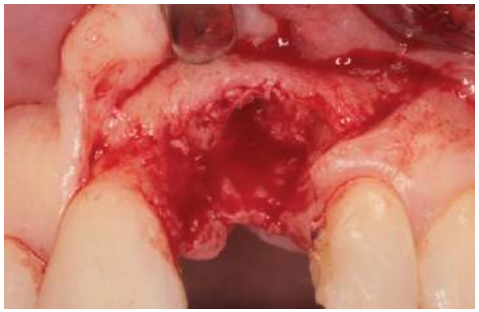


Fig. 3

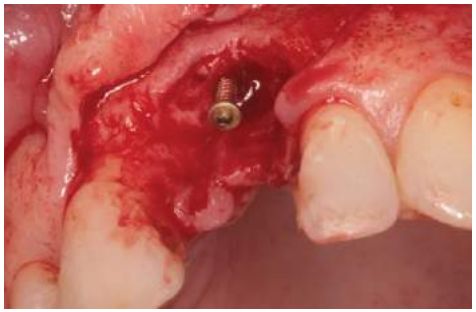


Fig. 4

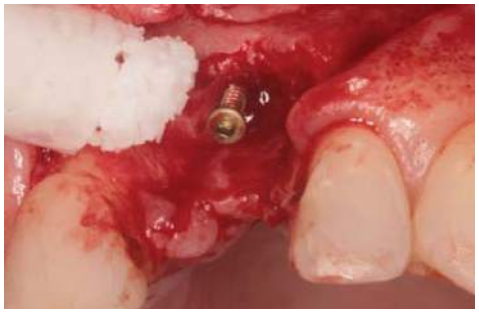


Fig. 5

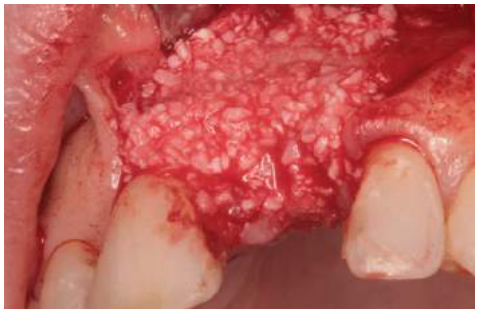


Fig. 6

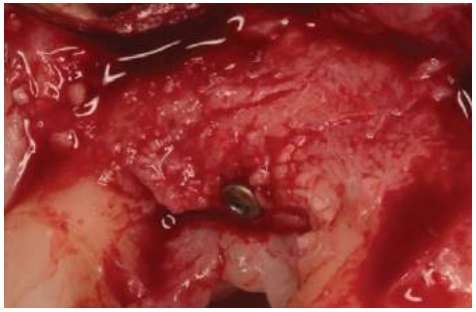


Fig. 7

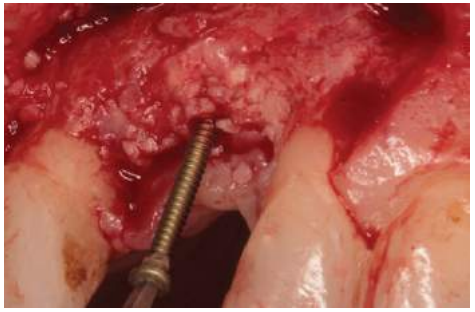


Fig. 8

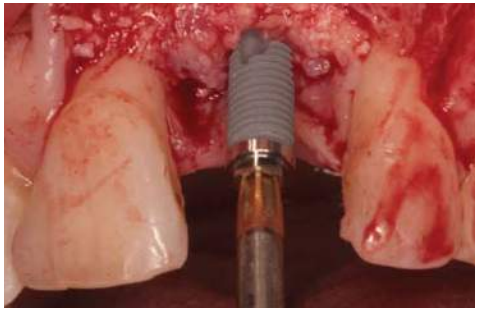


Fig. 9

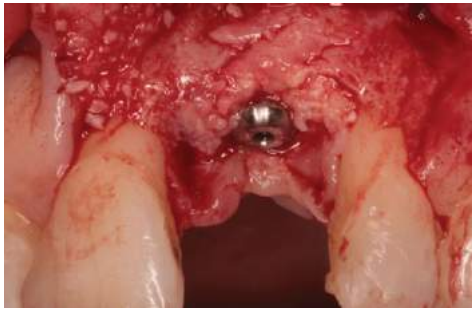


Fig. 10

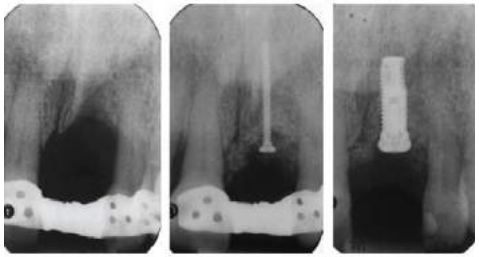


Fig. 11

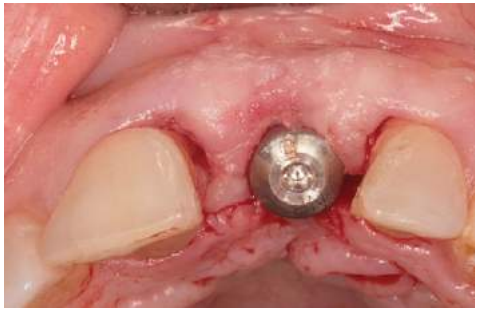


Fig. 12

HORIZONTAL / VERTICAL AUGMENTATION

Sex: **female** | Age: **46**

Fig. 1 Infected upper central incisor being extracted

Fig. 2 Inflamed tissues and major bone loss

Fig. 3 A flap is elevated, horizontal vertical ridge loss

Fig. 4 A fixation screw is vertically placed in the alveolus

Fig. 5 OsteoBiol® *mp3®* is compacted around the screw

Fig. 6 Ridge is recreated, compacting the *mp3®*. A collagen membrane is placed above the *mp3®* reconstruction

Fig. 7 Clinical view 4 months later. Dense bone recreated

Fig. 8 Fixation screw is removed

Fig. 9 A Brånemark implant NP is inserted

Fig. 10 See the bone level allowing optimal implant positioning

Fig. 11 Radiographs before the fixation screw, implant in place

Fig. 12 4 months later: second step surgery healing abutment is placed

Documentation provided by
Dr **Patrick Palacci**
Brånemark Osseointegration Center
Marseille, France
e-mail: patrick@palacci.com

Bone substitute: **OsteoBiol® *mp3®***
For more information on OsteoBiol® *mp3®* see page 32

Case report Vertical bone regeneration of the frontal mandible

Sex: **female** | Age: **58**

Fig. 1 Seriously resorbed alveolar ridge at the time of first surgical intervention

Fig. 2 Semicircular osteotomy performed with diamond circular saw in general anesthesia

Fig. 3 Osteotomy of lingual compact bone completed with chisel in order to avoid damaging of lingual periostium. The mobile segment of residual ridge was covered with soft tissue to give appropriate blood supply

Fig. 4 OsteoBiol® *Sp-Block* reshaped and inserted between mobile and stable segment of mandible

Fig. 5 Mobile segment fixed with two mini plates. Gaps were also filled with *Sp-Block* particles, obtained by mincing

Fig. 6 Uneventfully healed wound 10 days after surgical intervention

Fig. 7 Re-entry due to implantation 6 months after augmentation with *Sp-Block* under local anesthesia. Vital bone with incorporated xenograft was found. Mini-plates with all screws were on the same place

Fig. 8 Insertion of two implants (regions 4.2, 3.2). Minimal dehiscence was detected at region 4.2

Fig. 9 Dehiscence at region 4.2 grafted with OsteoBiol® *Gen-Os*® and covered with OsteoBiol® *Evolution*

Fig. 10 Suprastructures for supporting denture with stable mucosa 7 months after implantation and 3 months after healing abutment positioning

Fig. 11 Rehabilitation with removable denture on both jaws

Fig. 12 OPT 13 months after augmentation and 7 months after implantation. Both implants with prosthetical suprastructure show stable peri-implant bone

Documentation provided by
Dr **Miha Kočar**
Ljubljana, Slovenia
e-mail: mihakocar@yahoo.com

Bone substitute: **OsteoBiol® *Sp-Block***
For more information on OsteoBiol® *Sp-Block* see page 50

Bone substitute: **OsteoBiol® *Gen-Os*®**
For more information on OsteoBiol® *Gen-Os*® see page 24

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 58

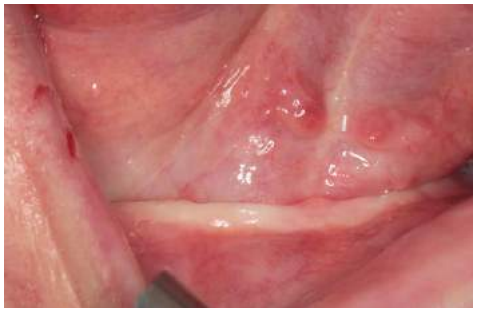


Fig. 1

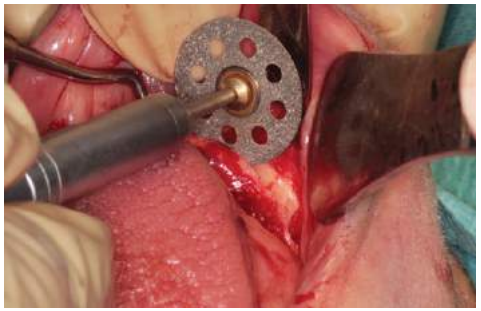


Fig. 2

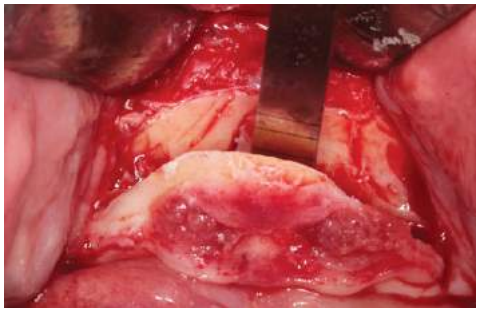


Fig. 3

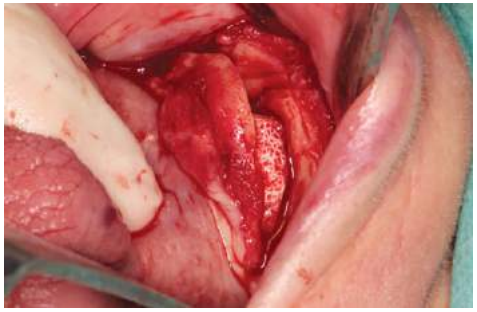


Fig. 4

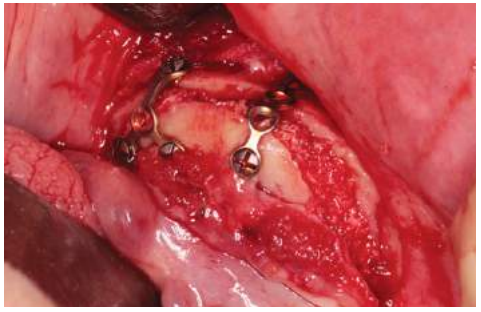


Fig. 5

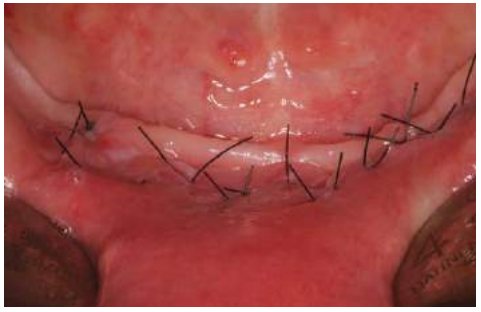


Fig. 6

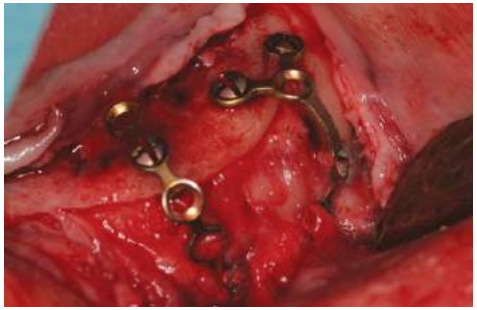


Fig. 7


Fig. 8

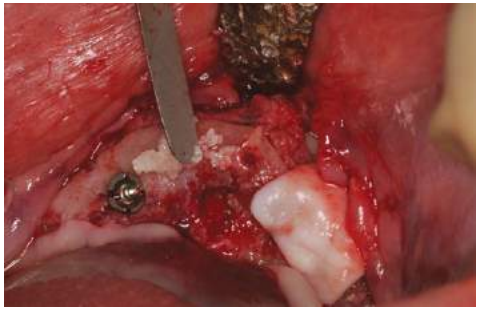


Fig. 9

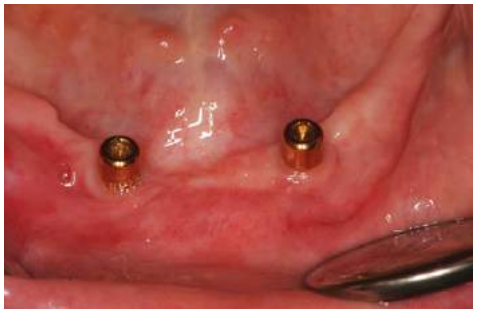


Fig. 10

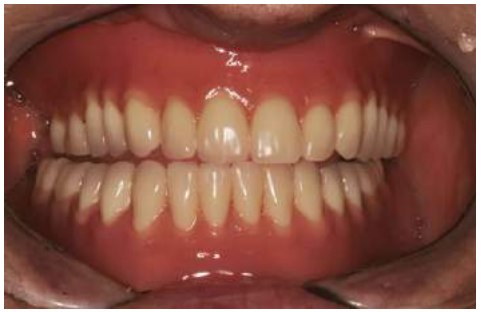


Fig. 11

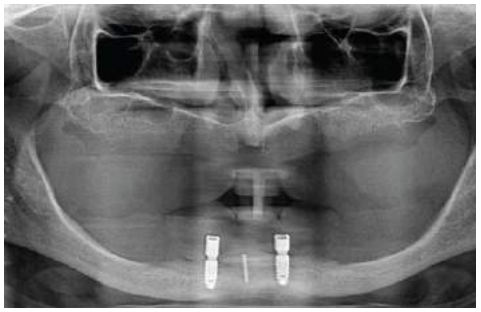


Fig. 12

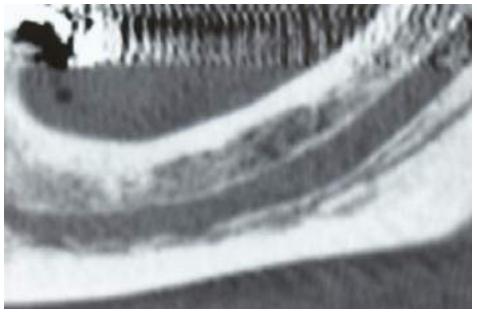


Fig. 1

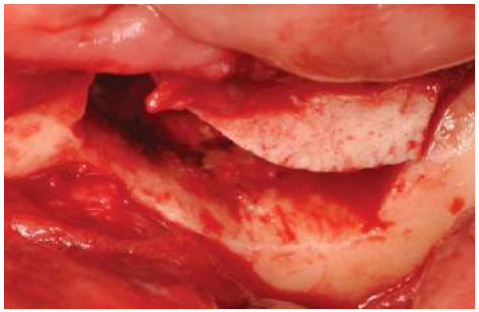


Fig. 2

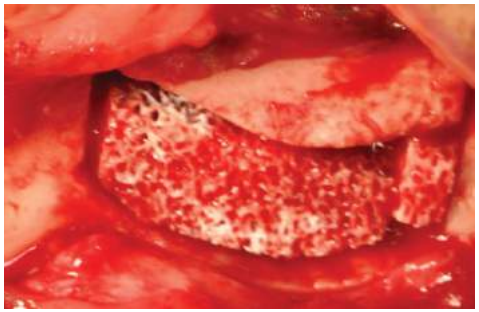


Fig. 3

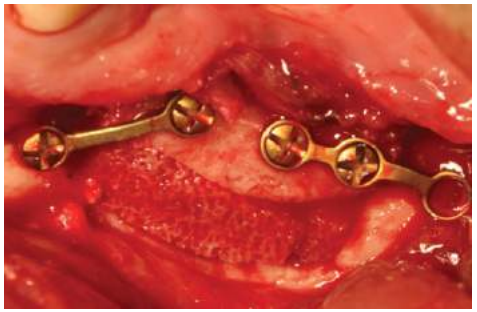


Fig. 4

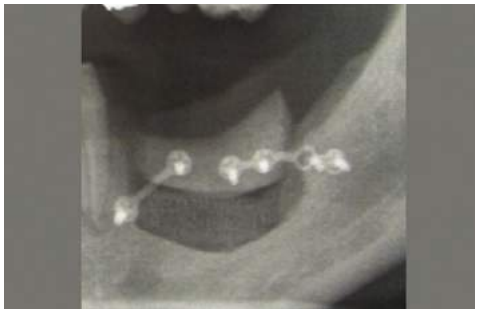


Fig. 5

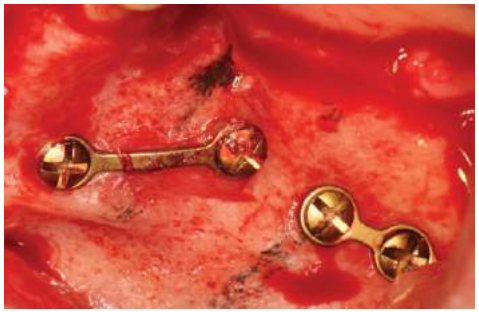


Fig. 6

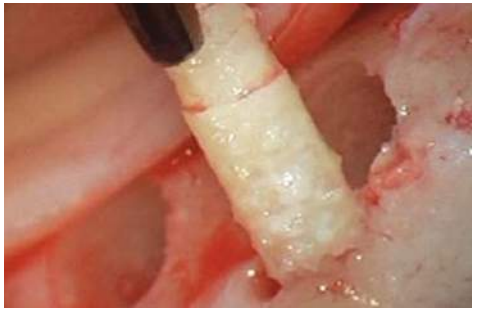


Fig. 7

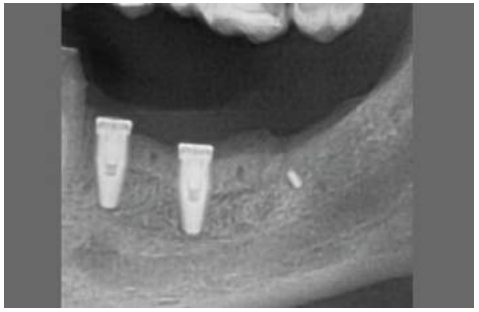


Fig. 8

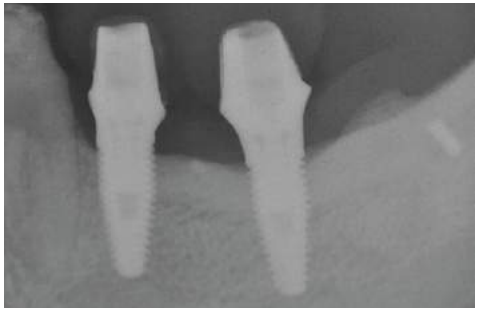


Fig. 9

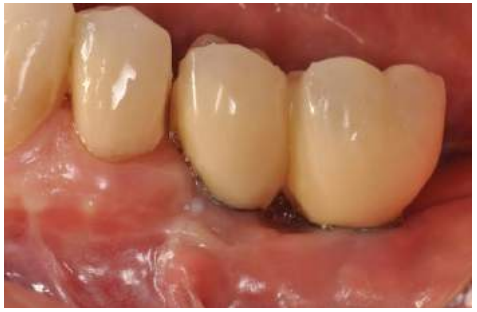


Fig. 10

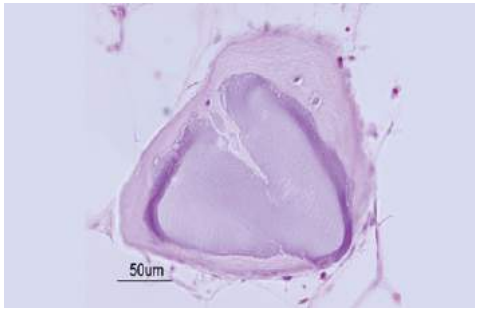


Fig. 11

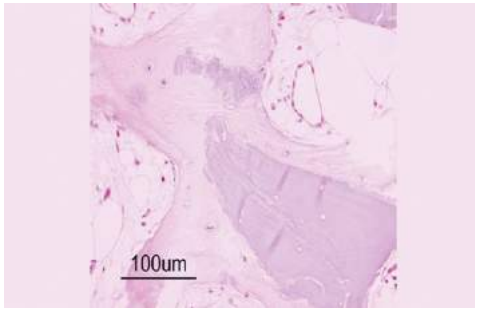


Fig. 12

Sex: **female** | Age: **60**

Fig. 1 Computed tomography scans taken before the augmentation procedure

Fig. 2 The cranial segment is moved upward and raised to the level of the alveolar crest

Fig. 3 Placement of a cancellous equine bone block as an interpositional graft

Fig. 4 Fixation of the graft with miniplates

Fig. 5 Postoperative panoramic radiographs showing the interpositional bone graft in the mandible

Fig. 6 Reopening during second-stage surgery after 3 months of healing

Fig. 7 Bone core retrieved for histological evaluation using a trephine with a 2 mm internal diameter

Fig. 8-9 Panoramic and intraoral x-rays taken 4 months after implant placement

Fig. 10 The provisional prosthesis delivered 4 months after implant placement

Fig. 11-12 Histology detail*. It is possible to notice the tight connection between biomaterial and the newly formed bone

Documentation provided by
Dr **Pietro Felice**
Prof **Roberto Pistilli**
University of Bologna, Italy
E-mail: pietro.felice@unibo.it

*Prof **Ulf Nannmark**
University of Göteborg, Sweden

Bone substitute: **OsteoBiol® *Sp-Block***
For more information on OsteoBiol® *Sp-Block* see page 50

Case report Localized aggressive periodontitis

Sex: **male** | Age: **39**

Fig. 1 Pre-op clinical situation

Fig. 2 Periodontal defect

Fig. 3 Occlusal view of the defect

Fig. 4 PrefGel conditioning

Fig. 5-6 OsteoBiol® *mp3*® grafting

Fig. 7 OsteoBiol® Lamina to protect the graft

Fig. 8 Occlusal view

Fig. 9 Preparation for a soft tissue graft after 4 months

Fig. 10 Connective tissue graft

Fig. 11 Pre-op and post-op x-rays at 20 months

Fig. 12 Clinical result at 20 months

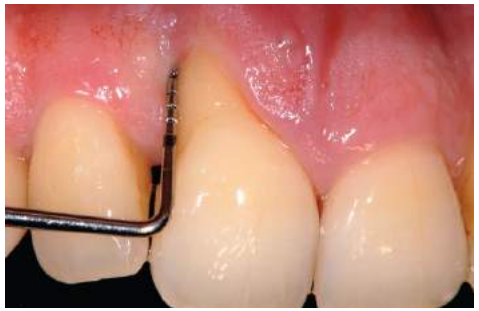


Fig. 1

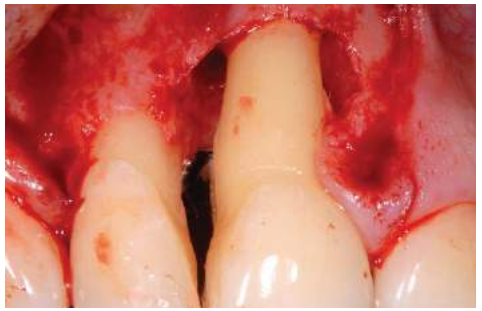


Fig. 2

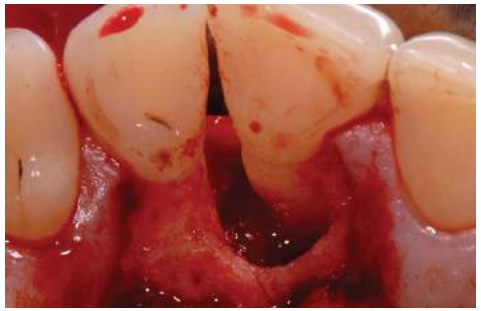


Fig. 3

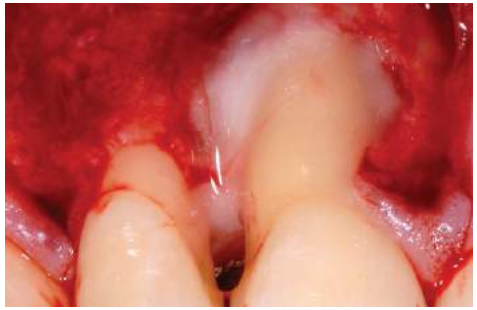


Fig. 4

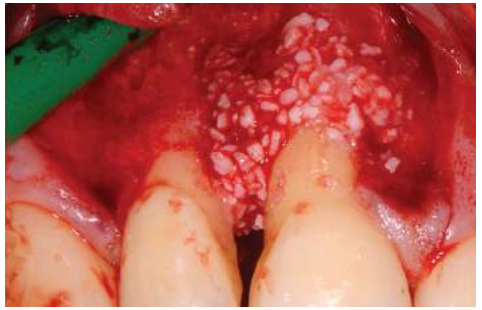


Fig. 5

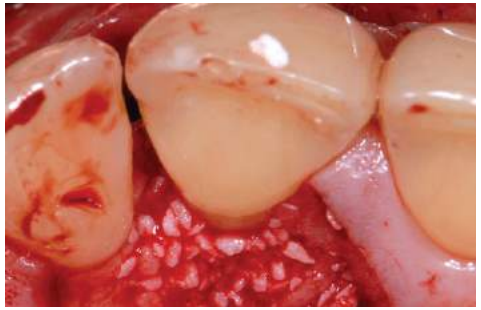


Fig. 6

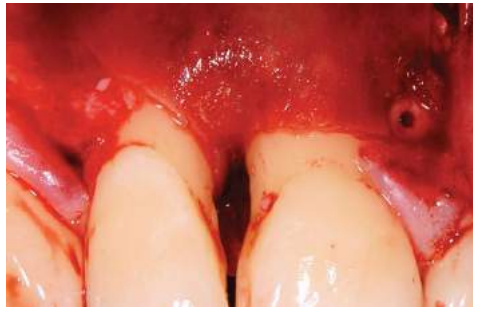


Fig. 7

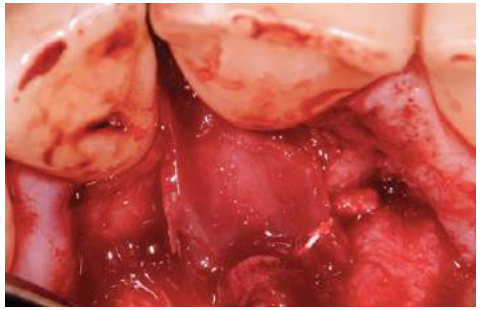


Fig. 8

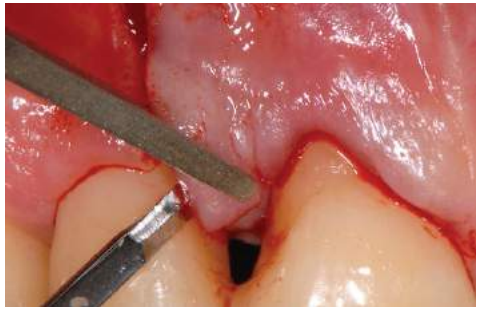


Fig. 9

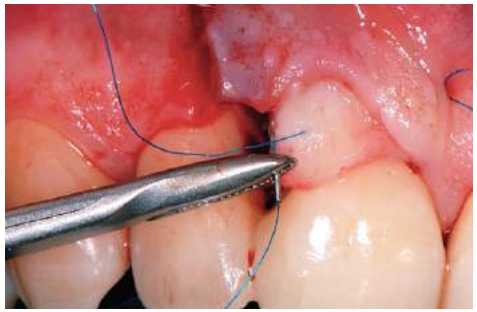


Fig. 10

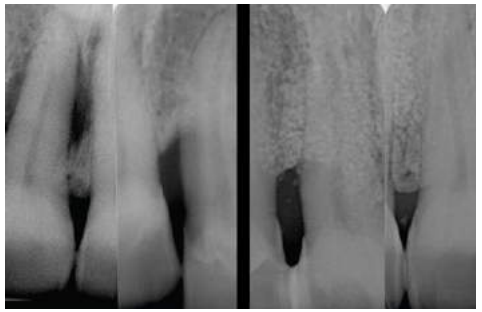


Fig. 11

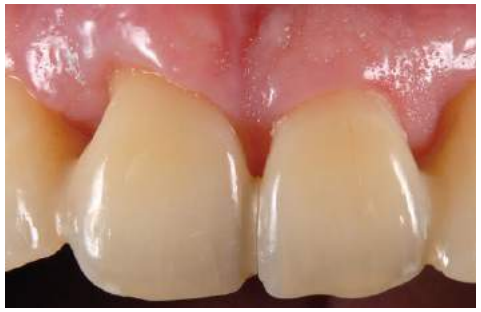


Fig. 12

Documentation provided by
Dr **Gerd Körner**
Bielefeld, Germany
e-mail: gerd.koerner@paroplant.com

Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 32

Membrane: **OsteoBiol® *Lamina***
For more information on OsteoBiol® *Lamina* see page 66

Case report Treatment of a periodontal defect in the anterior mandible

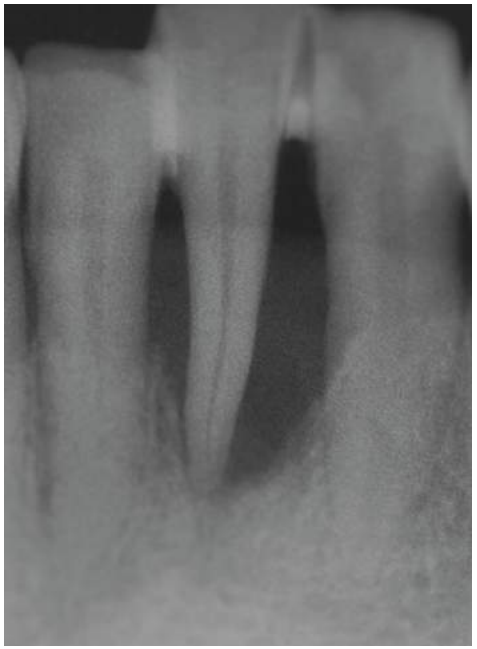


Fig. 1

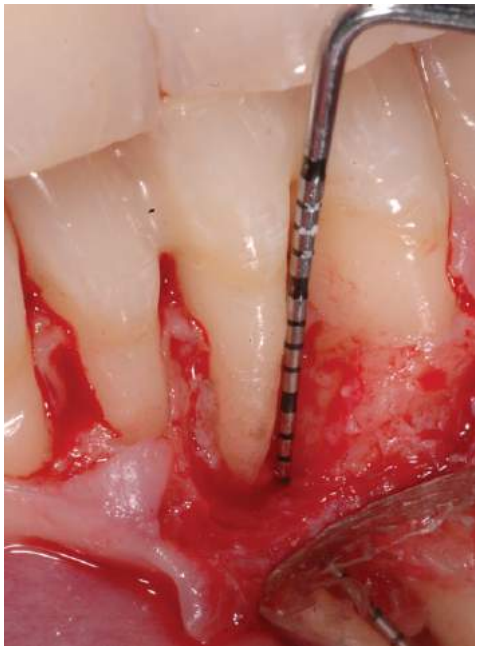


Fig. 2

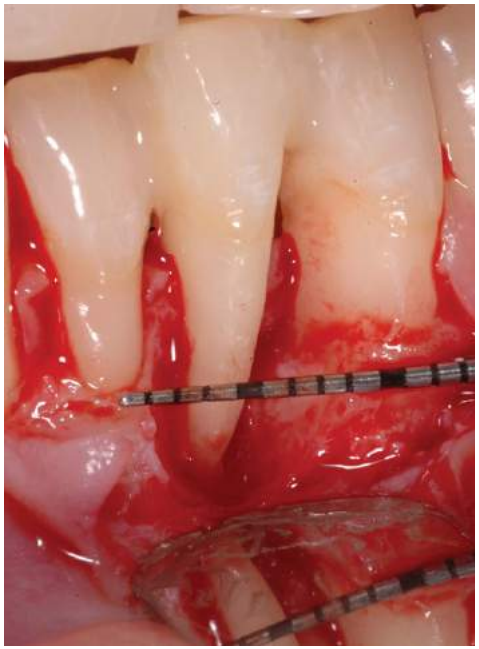


Fig. 3

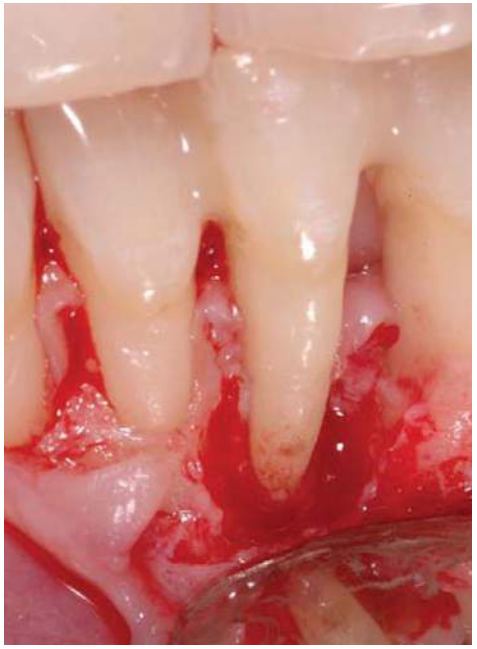


Fig. 4

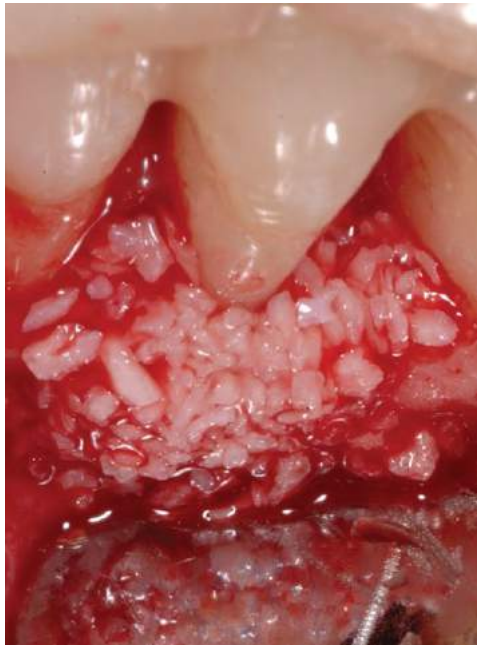


Fig. 5

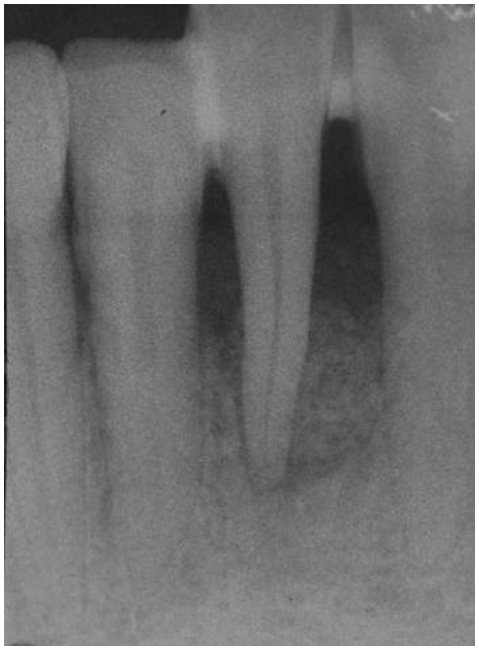


Fig. 6

Sex: **female** | Age: **34**

Fig. 1 Severe loss of attachment

Fig. 2 Pocket probing depth (PPD) 10 mm

Fig. 3-4 Intrabony defect

Fig. 5 Defect grafted with OsteoBiol® *Gen-Os®*, later covered with OsteoBiol® *Evolution*

Fig. 6 Attachment gain of 5 mm and regeneration of the intrabony defect after 12 months

Documentation provided by
Dr **Roberto Rossi**
M.Sc.D. in Periodontology, Genova, Italy
e-mail: drrossi@mac.com

Bone substitute: **OsteoBiol® *Gen-Os®***
For more information on OsteoBiol® *Gen-Os®* see page 24

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 58

Case report Gingival recession grafted with *Derma*

Sex: **female** | Age: **55**

Fig. 1-2 Multiple recessions and erosions in the lower arch

Fig. 3-5 Correction of the enamel defects

Fig. 6 Split flap

Fig. 7-9 Suturing of the OsteoBiol® *Derma* membrane

Fig. 10 Flap closure and healing

Fig. 11 Two weeks

Fig. 12 Three months

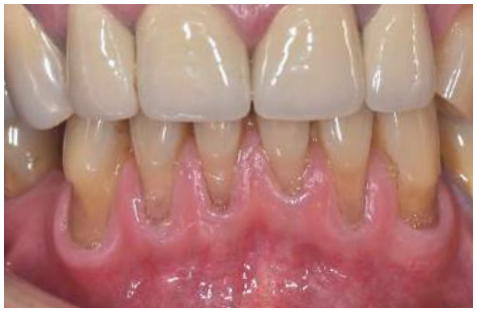


Fig. 1

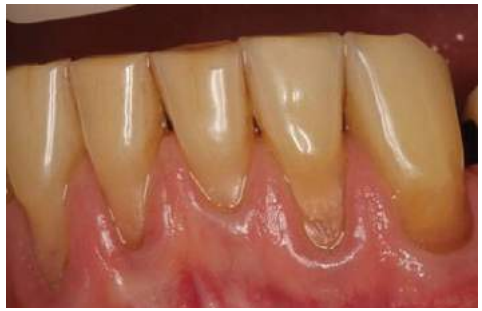


Fig. 2

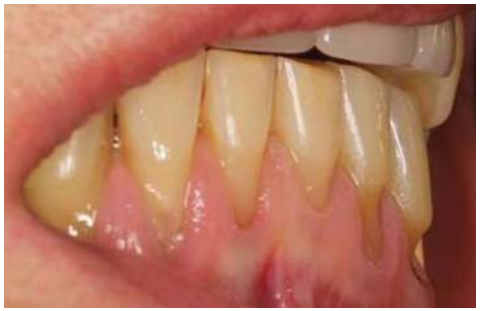


Fig. 3

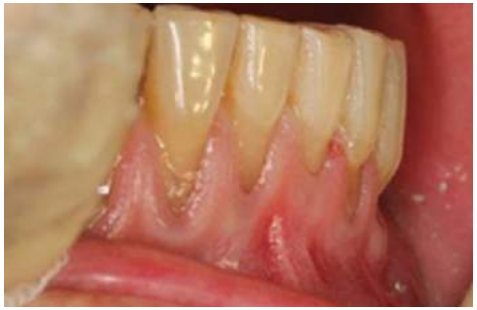


Fig. 4

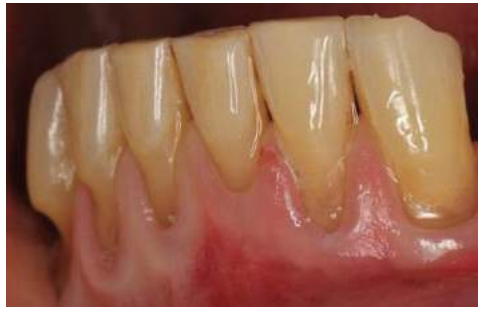


Fig. 5

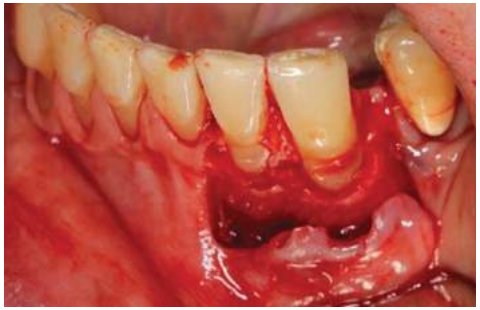


Fig. 6

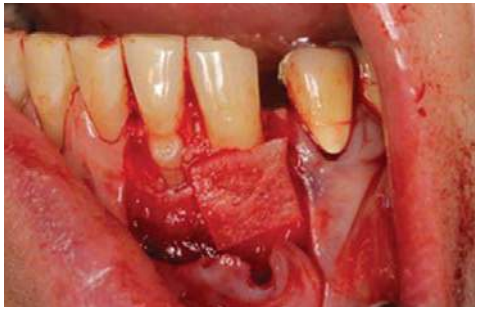


Fig. 7


Fig. 8

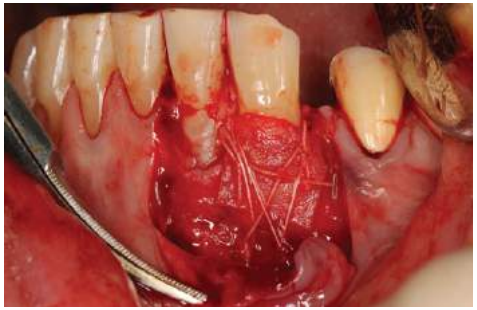


Fig. 9

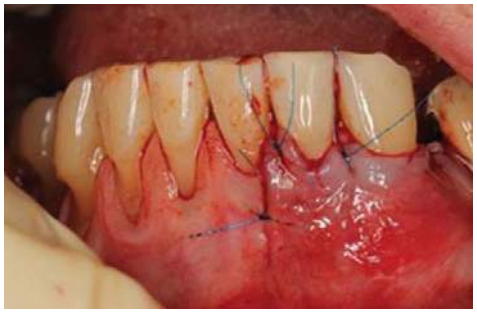


Fig. 10

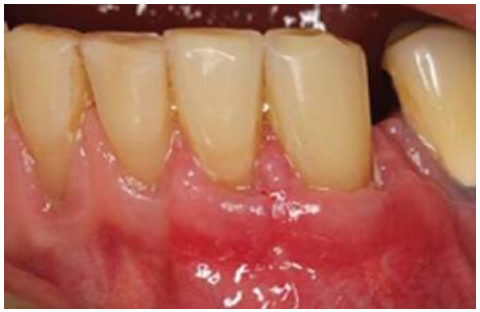


Fig. 11

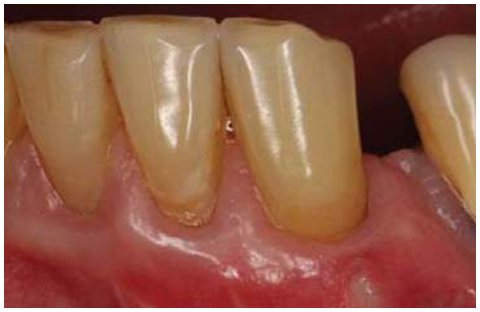


Fig. 12

Documentation provided by
Assist Prof **Rok Gašperšič**
Ljubljana, Slovenia
e-mail: rok.gaspersic@mf.uni-lj.si

Soft tissue: **OsteoBiol® *Derma***

For more information on OsteoBiol® *Derma* see page 62

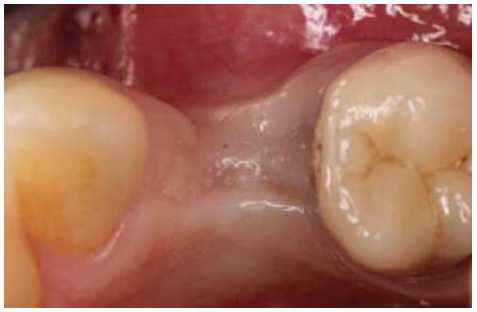


Fig. 1

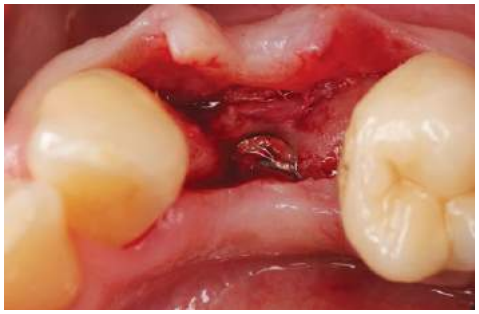


Fig. 2

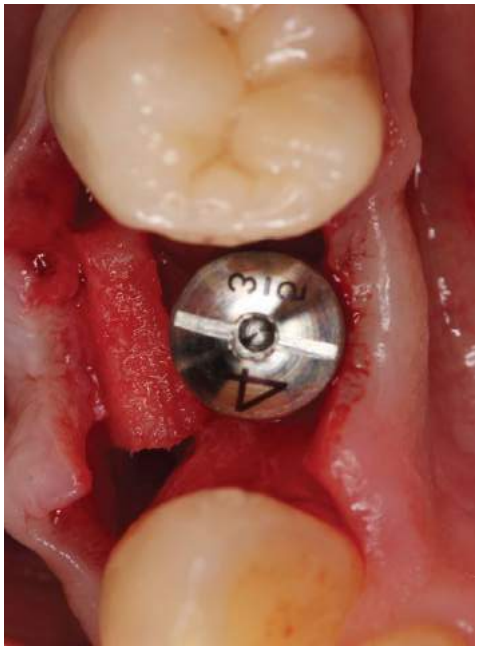


Fig. 3

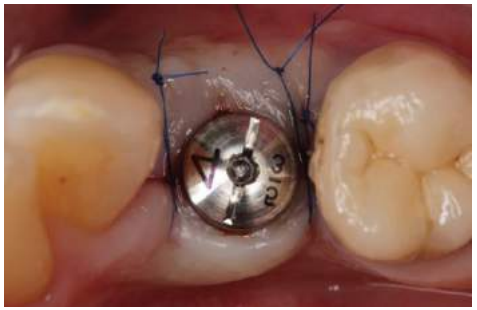


Fig. 4

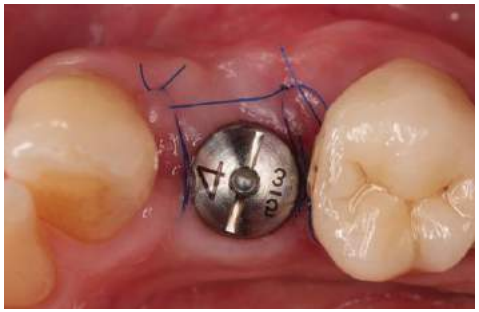


Fig. 5

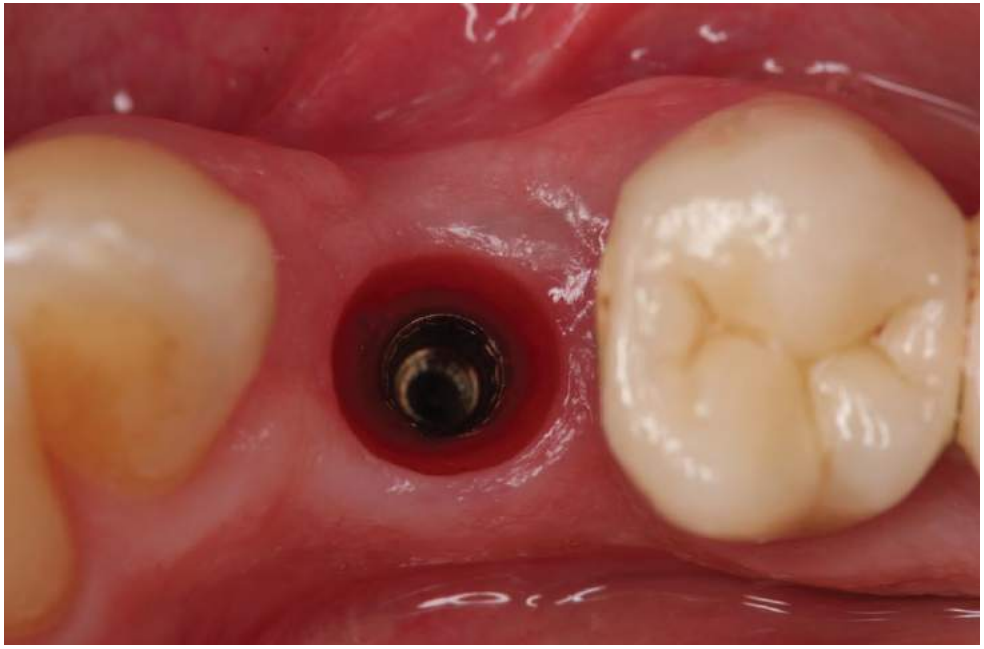


Fig. 6

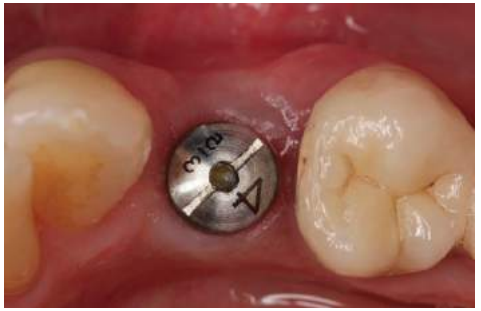


Fig. 7

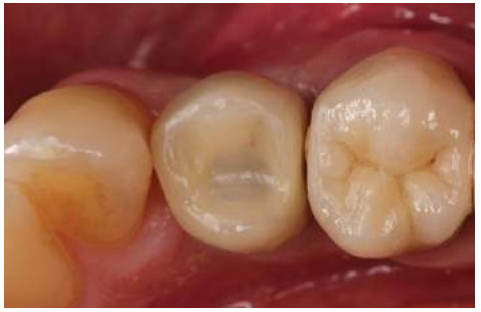


Fig. 8

Sex: **female** | Age: **65**

Fig. 1 At time of second stage a volume deficit is clearly visible

Fig. 2 Following a crestal incision, the implant is exposed

Fig. 3 A pouch is obtained on the buccal aspect and OsteoBiol® *Derma* is placed

Fig. 4 Two double interrupted sutures are used to close the tissue around the healing abutment

Fig. 5 Healing after 7 days presents uneventful

Fig. 6 At time of final impression an increase of tissue volume is visible

Fig. 7 Occlusal view showing that the dermal matrix is clinically fully integrated into the surrounding tissue

Fig. 8 Final reconstruction with a screw retained prosthesis

Documentation provided by
Prof **Stefan Fickl**
Associate Professor
Department of Periodontology,
Julius-Maximilians-University, Würzburg,
Germany
email: fickl_s@ukw.de

Soft tissue: **OsteoBiol® *Derma***
For more information on OsteoBiol® *Derma* see page 62

Bone, Biomaterials & Beyond

Prof Antonio Barone, Prof Ulf Nannmark

CONTENTS

The introduction of osseointegrated dental implants soon 50 years ago has indeed revolutionized dentistry.

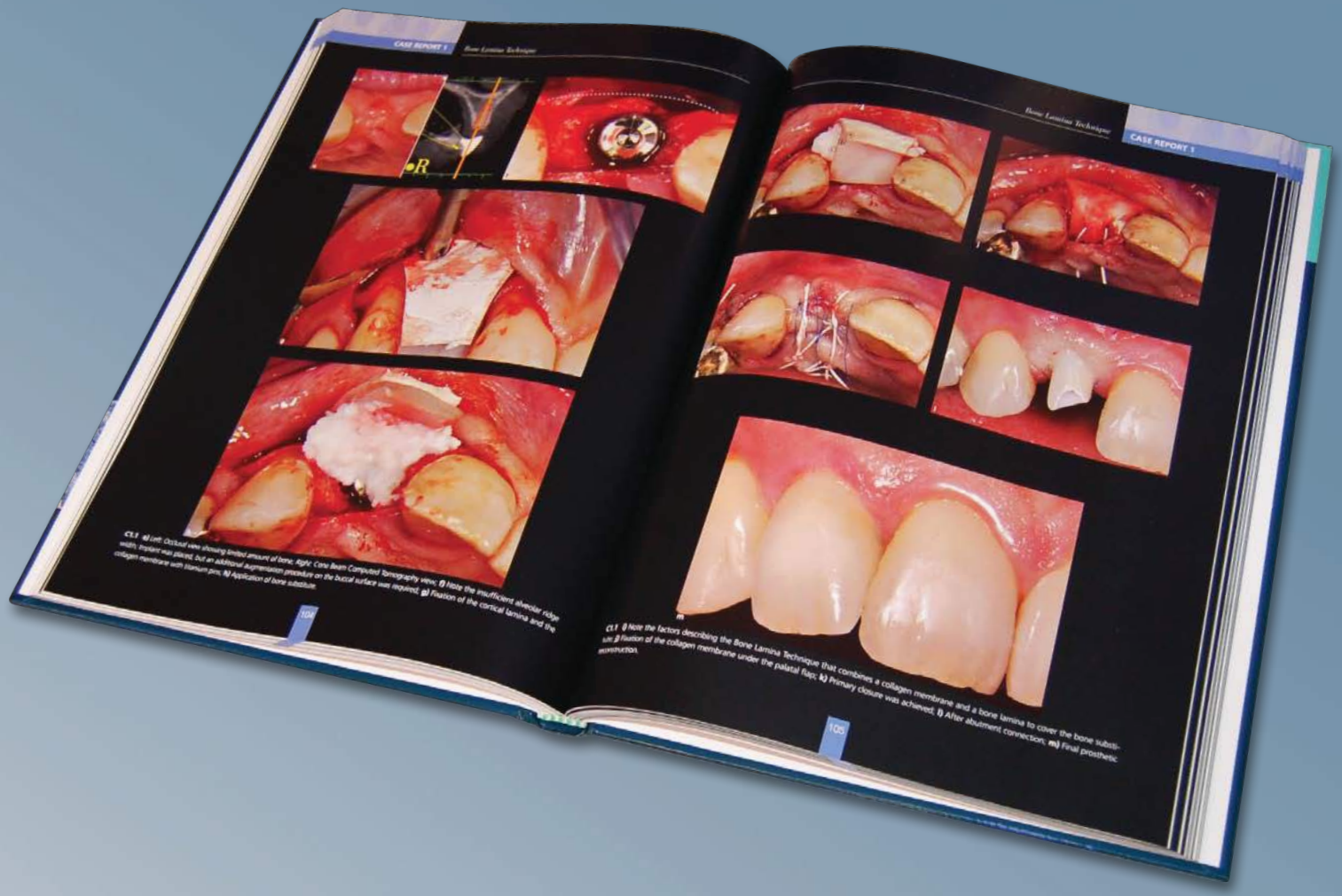
The scientific evaluation of their use has shown good and increasingly successful treatment outcomes.

A prerequisite though is the availability of sufficient bone volumes to ensure integration and acceptable aesthetic results.

In this book various surgical techniques, using different augmentation materials, are described and explained.

The aim has been to highlight minimally invasive surgical techniques, which lead to less risk of morbidity and reduce treatment time.

Readers will enjoy a comprehensive atlas providing some practical advise for every day surgical practice based on solid scientific evidence.



CHAPTERS

CHAPTER 1
An Introduction to Guided Bone Regeneration
Ugo Covani, Massimiliano Ricci, Simone Marconcini

CHAPTER 2
Bone Tissue Reactions to Bone Substitutes
Lars Sennerby, Ulf Nannmark

CHAPTER 3
Periodontal Regeneration
Roberto Rossi, Maria Gabriella Grusovin, Tobias Thalmair, Hannes Wachtel

CHAPTER 4
Fresh Extraction Socket Management
Antonio Barone, Adriano Piattelli, José Luis Calvo-Guirado, Fortunato Alfonsi, Bruno Negri, Giovanna Iezzi

CHAPTER 5
Maxillary Sinus Augmentation
Paolo Martegani, Ferdinando D'Avenia, Maurizio Silvestri, Sanjiv Kanagaraja

CHAPTER 6
The Bone Lamina Technique: A Novel Approach To Bone Augmentation
Hannes Wachtel, Christian Helf, Tobias Thalmair

CHAPTER 7
Reconstruction of Horizontal Ridge Defects
Arndt Happe, Christer Slotte

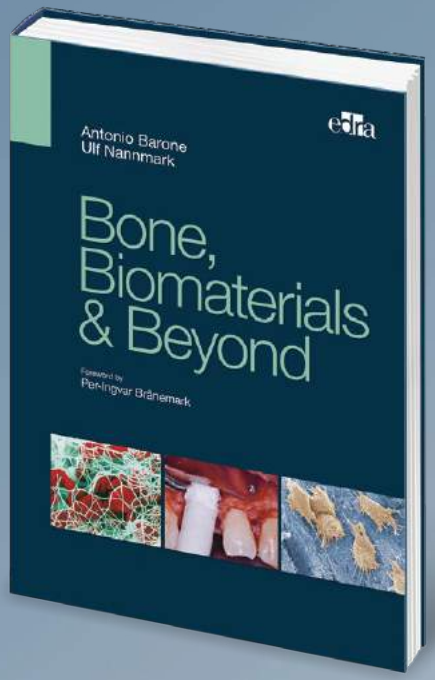
CHAPTER 8
The Inlay Technique in the Treatment of Posterior Mandibular Atrophy
Pietro Felice, Roberto Pistilli, Carlo Barausse

CHAPTER 9
Soft Tissue Augmentation
Stefan Fickl

CHAPTER 10
Surgical Treatment of Peri-Implant Bone Lesions
Christer Slotte

CHAPTER 11
Treatment of Extreme Cases
Patrick Palacci

Conclusions
Antonio Barone, Ulf Nannmark



EDRA Editions

Publication: March 2014
Pages: 200
Images: 786 color
Binding: hardcover
Size: 21x29,7 cm
Euro: 59,00
ISBN 978.88.214.3758.8

For information and orders please contact: ordini@lswr.it

Avallaible in the following languages:

Italian
German
French
Spanish
Russian
Korean


INNOVATION

Tecnoss® bone vs human bone

Studies and researches have demonstrated that gold standard in bone regeneration is autologous bone[1,2].
It is also well known, though, what disadvantages are related to the harvesting and grafting of autogenous bone[2-4].
The goal of bone regeneration is to heal bone deficits with newly-formed quality tissue, in order to achieve a functional recovery and esthetics. To obtain these results, hundreds of studies have been conducted about the clinical performance of biomaterials.
The examination of clinical results and the commercial diffusion of various kinds of products developed by the biomedical industry show a clear superiority of products of natural origin over those of synthetic derivation.
The structure of animal bone is morphologically more similar to human bone than any synthesized product, the latter presenting a morphological pattern and properties artificially created, which differ in various ways from the structure of natural bone[5].
Over the last thirty years several processes have been developed to allow the grafting of heterologous origin products in the human body without adverse reaction[6-8].
The first products developed through these technologies have shown encouraging clinical results, even if made of bone mineral matrix only.
The OsteoBiol® new generation of biomaterials, thanks to a revolutionary technology, goes beyond the simple role of aiding natural bone regrowth by stimulating and accelerating contact osteogenesis, with a behaviour similar to that of autogenous bone[9,10].

BIBLIOGRAPHY

(1) ORSINI G, SCARANO A, PIATTELLI M, PICCIRILLI M, CAPUTI S, PIATTELLI A
HISTOLOGIC AND ULTRASTRUCTURAL ANALYSIS OF REGENERATED BONE IN MAXILLARY SINUS AUGMENTATION USING A PORCINE BONE-DERIVED BIOMATERIAL
J PERIODONTOL, 2006 DEC;77(12):1984-90

(2) BARONE A, ALFONSI F, BORGIA V, IEZZI G, PIATTELLI A, COVANI U, TONELLI P
MOLECULAR, CELLULAR AND PHARMACEUTICAL ASPECTS OF FILLING BIOMATERIALS DURING THE MANAGEMENT OF EXTRACTION SOCKETS
CURR PHARM BIOTECHNOL, 2017;18(1):64-75

(3) IEZZI G, PIATTELLI A, GIULIANI A, MANGANO C, BARONE A, MANZON L, DEGIDI M, SCARANO A, FILIPPONE A, PERROTTI V
MOLECULAR, CELLULAR AND PHARMACEUTICAL ASPECTS OF FILLING BIOMATERIALS DURING MAXILLARY SINUS-LIFT PROCEDCURES. PART 2: DETAILED CHARACTERISTICS OF THE MATERIALS
CURR PHARM BIOTECHNOL, 2017, 18, 33-44

(4) BARONE A, CRESPI R, ALDINI NN, FINI M, GIARDINO R, COVANI U
MAXILLARY SINUS AUGMENTATION: HISTOLOGIC AND HISTOMORPHOMETRIC ANALYSIS
INT J ORAL MAXILLOFAC IMPLANTS, 2005 JUL-AUG; 20(4):519-25

(5) FIGUEIREDO A, COIMBRA P, CABRITA A, GUERRA F, FIGUEIREDO M
COMPARISON OF A XENOGENEIC AND AN ALLOPLASTIC MATERIAL USED IN DENTAL IMPLANTS IN TERMS OF PHYSICO-CHEMICAL CHARACTERISTICS AND IN VIVO INFLAMMATORY RESPONSE
MATER SCI ENG C MATER BIOL APPL, 2013 AUG 1;33(6):3506-13

(6) SCARANO A, PIATTELLI A, ASSENZA B, QUARANTA A, PERROTTI V, PIATTELLI M, IEZZI G
PORCINE BONE USED IN SINUS AUGMENTATION PROCEDURES: A 5-YEAR RETROSPECTIVE CLINICAL EVALUATION
J ORAL MAXILLOFAC SURG, 2010 AUG; 68(8):1869-73

(7) RAMIREZ FERNANDEZ MP, CALVO GUIRADO JL, MATÉ SANCHEZ DE VAL JE, DELGADO RUIZ RA, NEGRI B, BARONA DORADO C
ULTRASTRUCTURAL STUDY BY BACKSCATTERED ELECTRON IMAGING AND ELEMENTAL MICROANALYSIS OF BONE-TO-BIOMATERIAL INTERFACE AND MINERAL DEGRADATION OF PORCINE XENOGRAFTS USED IN MAXILLARY SINUS FLOOR ELEVATION
CLIN ORAL IMPLANTS RES, 2013 MAY;24(5):523-30

(8) ROSSI R, RANCITELLI D, POLI PP, RASIA DAL POLO M, NANNMARK U, MAIORANA C
THE USE OF A COLLAGENATED PORCINE CORTICAL LAMINA IN THE RECONSTRUCTION OF ALVEOLAR RIDGE DEFECTS. A CLINICAL AND HISTOLOGICAL STUDY
MINERVA STOMATOL, 2016 OCT;65(5):257-68

(9) CASSETTA M, RICCI L, IEZZI G, DELL'AQUILA D, PIATTELLI A, PERROTTI V
RESONANCE FREQUENCY ANALYSIS OF IMPLANTS INSERTED WITH A SIMULTANEOUS GRAFTING PROCEDURE: A 5-YEAR FOLLOW-UP STUDY IN MAN
INT J PERIODONTICS RESTORATIVE DENT, 2012 OCT;32(5):581-9

(10) CASSETTA M, PERROTTI V, CALASSO S, PIATTELLI A, SINJARI B, IEZZI G
BONE FORMATION IN SINUS AUGMENTATION PROCEDURES USING AUTOLOGOUS BONE, PORCINE BONE, AND A 50 : 50 MIXTURE: A HUMAN CLINICAL AND HISTOLOGICAL EVALUATION AT 2 MONTHS
CLIN ORAL IMPLANTS RES, 2015 OCT;26(10):1180-4

Why xenografts?

"The ideal bone substitute should be easy to handle and should not be resorbed too fast via an inflammatory process or induce adverse reactions"

Marco Esposito DDS, PhD
Associate Professor in Biomaterials,
University of Göteborg, Sweden

Xenografts are the most used biomaterials worldwide.

This is because:

- tissues of origin are extremely safe and available in unlimited quantities
- xenogenic bone surface and porosity are extremely similar to autogenous bone
- there is no need to harvest autogenous bone in extraoral sites, with the related risk of morbidity and post-operatory complications
- sterile xenografts are completely biocompatible and safe
- no adverse reactions after grafting deriving from biomaterial degradation
- easy to handle, quick learning curve
- collagenated xenografts enhance osteoblasts and osteoclasts activity
- wide scientific documentation
- excellent clinical performance
- storage can be done at room temperature
- long shelf life (5 years from production date)
- excellent price/quality ratio

"Xenografts offer a reliable if not better alternative to autogenous bone in practically all indications when used in conjunction with dental implants or in periodontal therapy. There is more evidence supporting the use of xenografts than other types of bone substitutes"

Marco Esposito DDS, PhD
Associate Professor in Biomaterials,
University of Göteborg, Sweden

Characteristics of Tecnoss® process

Tecnoss® has developed treatment manufacturing processes of tissues from various animal species, allowing to obtain the biocompatibility of these tissues, preserving at the same time their collagen matrix[1].
The protein components of animal tissues are determinant to make every individual unique. They activate the cells of the immune system of the receiving organism by interacting with receptors of the Major Histocompatibility Complex (MHC).
Their neutralization/denaturation allows collagen mineral bone matrix to be transferred from animal to man without any dangerous adverse reaction outbreak.
Successful Guided Bone Regeneration (GBR) depends both on stimulation of tissues involved in new bone formation and on the characteristics of grafted biomaterials, which can determine the quality of bone/graft interface. The basic research for development of OsteoBiol® product line has thus been driven by the ideal biomaterial concept: a material with the highest affinity to the new endogenous bone.
To pursue this aim, Tecnoss® developed a biotechnology able to preserve the structure of the natural hydroxyapatite by avoiding the high temperature ceramization phase, therefore allowing a bone turnover time of the grafted site similar to the one of the physiologic natural process[2].
Thanks to this innovative technology, the OsteoBiol® line has the following important characteristics:

1. Cell growth support and differentiation[3]
2. Absence of a foreign body response[4,5]
3. Gradual resorption over time[2,6]
4. Stimulation of the physiological tissue regeneration process[7]
5. Protection of the grafting site from infection (membranes)[5,8]
6. Capability of carrying medication to the surgical site[9]
7. Absorption and release over time of growth factors [10]

BIBLIOGRAPHY

(1) FIGUEIREDO M, HENRIQUES J, MARTINS G, GUERRA F, JUDAS F, FIGUEIREDO H
PHYSICOCHEMICAL CHARACTERIZATION OF BIOMATERIALS COMMONLY USED IN DENTISTRY AS BONE SUBSTITUTES - COMPARISON WITH HUMAN BONE
J BIOMED MATER RES B APPL BIOMATER, 2010 FEB; 92(2):409-19

(2) NANNMARK U, SENNERBY L
THE BONE TISSUE RESPONSES TO PREHYDRATED AND COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS: A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2008 DEC;10(4):264-70

(3) TRUBIANI O, SCARANO A, ORSINI G, DI IORIO D, D'ARCANGELO C, PICCIRILLI M, SIGISMONDO M, CAPUTI S
THE PERFORMANCE OF HUMAN PERIODONTAL LIGAMENT MESENCHYMAL STEM CELLS ON XENOGENIC BIOMATERIALS
INT J IMMUNOPATHOL PHARMACOL, 2007 JAN-MAR; 20(1 SUPPL 1):87-91

(4) BARONE A, RICCI M, GRASSI RF, NANNMARK U, QUARANTA A, COVANI U
A 6-MONTH HISTOLOGICAL ANALYSIS ON MAXILLARY SINUS AUGMENTATION WITH AND WITHOUT USE OF COLLAGEN MEMBRANES OVER THE OSTEOTOMY WINDOW: RANDOMIZED CLINICAL TRIAL
CLIN ORAL IMPLANTS RES, 2013 JAN;24(1):1-6

(5) BARONE A, BORGIA V, COVANI U, RICCI M, PIATTELLI A, IEZZI G
FLAP VERSUS FLAPLESS PROCEDURE FOR RIDGE PRESERVATION IN ALVEOLAR EXTRACTION SOCKETS: A HISTOLOGICAL EVALUATION IN A RANDOMIZED CLINICAL TRIAL
CLIN ORAL IMPLANTS RES, 2015 JUL;26(7):806-13

6) BARONE A, RICCI M, COVANI U, NANNMARK U, AZARMEHR I, CALVO GUIRADO JL
MAXILLARY SINUS AUGMENTATION USING PREHYDRATED CORTICOCANCELLOUS PORCINE BONE: HYSTOMORPHOMETRIC EVALUATION AFTER 6 MONTHS
CLIN IMPLANT DENT RELAT RES, 2012 JUN:14(3):373-9

(7) ROMBOUTS C, JEANNEAU C, CAMILLERI J, LAURENT P, ABOUT I
CHARACTERIZATION AND ANGIOGENIC POTENTIAL OF XENOGENEIC BONE GRAFTING MATERIALS: ROLE OF PERIODONTAL LIGAMENT CELLS
DENT MATER J, 2016 DEC 1;35(6):900-907

(8) BARONE A, RICCI M, TONELLI P, SANTINI S, COVANI U
TISSUE CHANGES OF EXTRACTION SOCKETS IN HUMANS: A COMPARISON OF SPONTANEOUS HEALING VS. RIDGE PRESERVATION WITH SECONDARY SOFT TISSUE HEALING
CLIN ORAL IMPLANTS RES, 2013 NOV;24(11):1231-7

(9) FISCHER KR, STAVROPOULOS A, CALVO GUIRADO JL, SCHNEIDER D, FICKL S
INFLUENCE OF LOCAL ADMINISTRATION OF PAMIDRONATE ON EXTRACTION SOCKET HEALING – A HISTOMORPHOMETRIC PROOF-OF-PRINCIPLE PRE-CLINICAL IN VIVO EVALUATION
CLIN ORAL IMPLANTS RES, 2015 OCT;26(10):1135-42

(10) MIJIRITSKY E, FERRONI L, GARDIN C, BRESSAN E, ZANETTE G, PIATTELLI A, ZAVAN B
PORCINE BONE SCAFFOLDS ADSORB GROWTH FACTORS SECRETED BY MSCS AND IMPROVE BONE TISSUE REPAIR
MATERIALS, 2017 SEP 8;10(9)

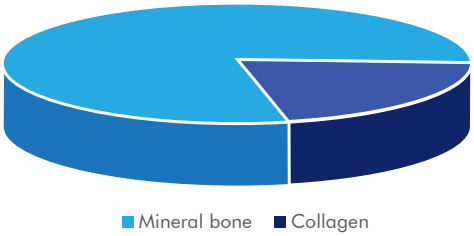
Collagen: a key factor for clinical success

Tecnoss® exclusive manufacturing process is able to neutralize the antigenic components present in heterologous bone with achievement of biocompatibility and preservation of the collagen matrix inside the granules of biomaterial.
Moreover, the molecular structure of natural hydroxyapatite is not significantly altered thanks to the limited maximum process temperature[1].
These characteristics of OsteoBiol® products allow a consistent bone neo-formation and a close contact between mature neo-formed bone and biomaterial granules[2-5].
Collagen has a key role in bone regeneration process in that:

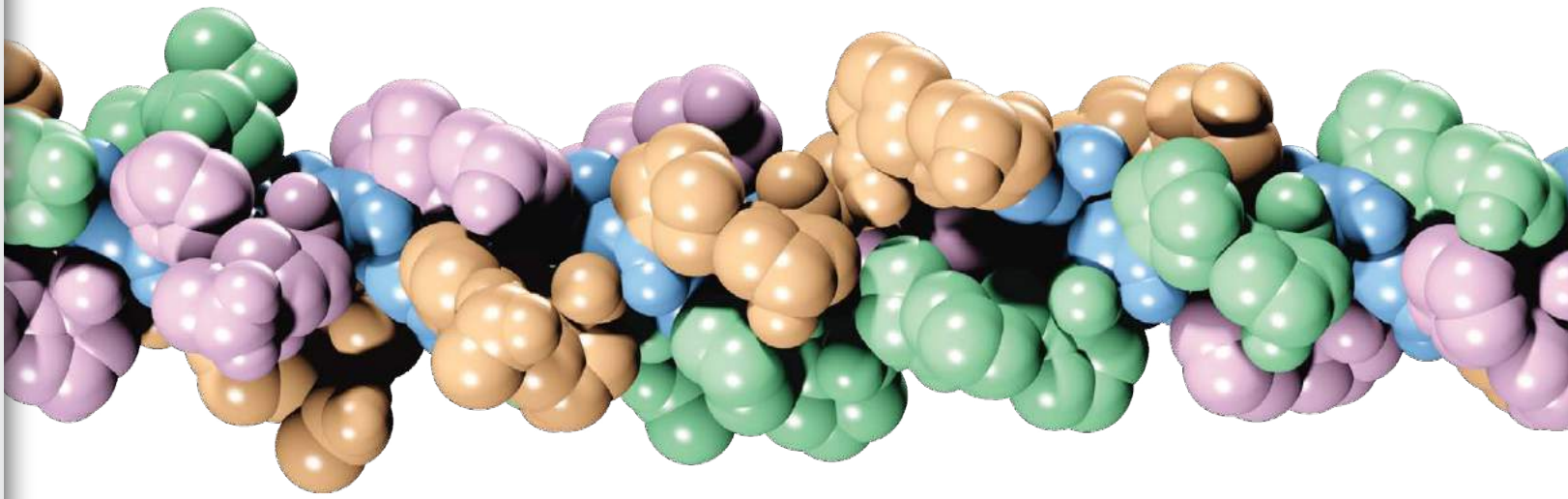
- it acts as a valid substrate for platelet activation and aggregation
- it serves to attract and differentiate the mesenchymal stem cells present in the bone marrow[6]
- it increases the proliferation rate of the osteoblasts up to 2/3 times[7]
- it stimulates the activation of the platelets, osteoblasts and osteoclasts in the bone healing process[8].

The presence of collagen inside each granule makes OsteoBiol® *Gen-Os*® hydrophilic and facilitates further mixing with collagen gel.
This technology has permitted the development of three versatile and innovative products: OsteoBiol® *mp3*®, OsteoBiol® *Putty* and OsteoBiol® *Gel 40*. Their consistency allows an ideal filling of bone defects and guarantees simple handling and fast application.
The OsteoBiol® new generation of biomaterials, thanks to a revolutionary technology, goes beyond the simple role of aiding natural bone regrowth by stimulating and accelerating this vital physiological process.

Composition of **OsteoBiol® *Gen-Os*®**



Source: University of Duisburg-Essen, Germany



BIBLIOGRAPHY

(1) FIGUEIREDO M, HENRIQUES J, MARTINS G, GUERRA F, JUDAS F, FIGUEIREDO H
PHYSICOCHEMICAL CHARACTERIZATION OF BIOMATERIALS COMMONLY USED IN DENTISTRY AS BONE SUBSTITUTES - COMPARISON WITH HUMAN BONE
J BIOMED MATER RES B APPL BIOMATER, 2010 FEB; 92(2):409-19

(2) ORSINI G, SCARANO A, PIATTELLI M, PICCIRILLI M, CAPUTI S, PIATTELLI A
HISTOLOGIC AND ULTRASTRUCTURAL ANALYSIS OF REGENERATED BONE IN MAXILLARY SINUS AUGMENTATION USING A PORCINE BONE-DERIVED BIOMATERIAL
J PERIODONTOL, 2006 DEC;77(12):1984-90

(3) RAMIREZ FERNANDEZ MP, CALVO GUIRADO JL, MATÉ SANCHEZ DE VAL JE, DELGADO RUIZ RA, NEGRI B, BARONA DORADO C
ULTRASTRUCTURAL STUDY BY BACKSCATTERED ELECTRON IMAGING AND ELEMENTAL MICROANALYSIS OF BONE-TO-BIOMATERIAL INTERFACE AND MINERAL DEGRADATION OF PORCINE XENOGRAFTS USED IN MAXILLARY SINUS FLOOR ELEVATION
CLIN ORAL IMPLANTS RES, 2013 MAY;24(5):523-30

(4) FELICE P, PIANA L, CHECCHI L, CORVINO V, NANNMARK U, PIATTELLI M
VERTICAL RIDGE AUGMENTATION OF ATROPHIC POSTERIOR MANDIBLE WITH AN INLAY TECHNIQUE AND CANCELLOUS EQUINE BONE BLOCK: A CASE REPORT
INT J PERIODONTICS RESTORATIVE DENT, 2013 MAR-APR;33(2):159-66

(5) IEZZI G, PIATTELLI A, GIULIANI A, MANGANO C, BARONE A, MANZON L, DEGIDI M, SCARANO A, FILIPPONE A, PERROTTI V
MOLECULAR, CELLULAR AND PHARMACEUTICAL ASPECTS OF FILLING BIOMATERIALS DURING MAXILLARY SINUS-LIFT PROCEDCURES. PART 2: DETAILED CHARACTERISTICS OF THE MATERIALS
CURR PHARM BIOTECHNOL, 2017,18,33-44

(6) MIZUNO M, FUJISAWA R, KUBOKI Y
TYPE I COLLAGEN-INDUCED OSTEOBLASTIC DIFFERENTIATION OF BONE-MARROW CELLS MEDIATED BY COLLAGEN-A2B1 INTEGRIN INTERACTION
J CELL PHYSIOL. 2000 AUG;184(2):207-13

(7) HSU FY, CHUEH SC, WANG YJ
MICROSPHERES OF HYDROXYAPATITE/RECONSTITUTED COLLAGEN AS SUPPORTS FOR OSTEOBLAST CELL GROWTH
BIOMATERIALS 1999, 20:1931-1936

(8) ABDELGAWAD ME, SØE K, ANDERSEN TL, MERRILD DM, CHRISTIANSEN P, KJÆRSGAARD-ANDERSEN P, DELAISSE JM
DOES COLLAGEN TRIGGER THE RECRUITMENT OF OSTEOBLASTS INTO VACATED BONE RESORPTION LACUNAE DURING BONE REMODELING?
BONE, 2014 OCT;67:181-8

Collagen and bone regeneration

Guided bone regeneration (GBR) is necessary to treat bone deficits due to lesions or bacterial infections.
The bone defect recovery occurs through the general mechanisms of tissue healing, that is, by complex dynamic mechanisms directed towards the repair of tissue function and anatomic integrity.
The discovery of the events pathway leading to tissue healing has helped to clearly identify the main actors in bone healing process; the concomitant presence of the following three components is necessary for the formation of "*de novo*" bone tissue:

- the platelets represent the principal actors during the first phase of the healing process, when, subsequent to a lesion, an initial deposition of fibrin and the formation of blood clot take place. This phase is characterized by significant activation of the chemical signals mediated by cytokines and growth factors.
In fact, the primary post-haemorrhagic clot formation process through platelet aggregation and lysis causes the release of both the coagulation cascade factors and growth factors, such as PDGF, IGF 1, IGF 2 and VEGF which are known for their activating effect on osteoblasts and osteoclasts, and TGF-β (Bone Morphogenetic Proteins belong to this superfamily) which starts bony callus formation.

- the osteoblastic precursors deriving from bone marrow mesenchymal stem cells are responsible, after cell differentiation in osteoblasts, for the second phase of the healing process (enchondral and/or intramembranous ossification) thanks to the synthesis of collagen and other components of the extracellular matrix.

- an insoluble substrate, suitable carrier for osteoinductive signal and able to support and guide new bone tissue formation. Sampath and Reddi (1980) demonstrated crosslinked type I collagen to be the most appropriate carrier for promoting osteoinductive signal activity.
The continuous progresses in comprehension of biological mechanisms regulating bone tissue morphogenesis can be exploited also for elaboration of natural or artificial products able to restore or maintain the function of damaged tissues and organs (tissue engineering)[1-3].
In vitro studies demonstrated that heterologous collagen is able to induce differentiation of mesenchymal osteoprogenitor stem cells into osteoblasts[4], and that association of collagen type I with a scaffold of hydroxyapatite significantly enhances osteoblasts proliferation rate.
This important scientific evidence provides the rationale behind OsteoBiol® product line: a complete series of biomaterials with collagen base.
Collagen, in addition to its well-known structural action carried on connective tissues, is endowed with the following important properties, useful in tissue reparation processes:

1. Haemostasis
Collagen is able to activate the receptors present on cellular membranes of platelets, responsible for their aggregation and lysis process; moreover, during the first week, it reinforces the action of fibrin in the formation of the primary clot, and then, in the second week, it replaces the function of fibrin.

2. Debridement
Collagen has a chemotactic action on monocyte/macrophage cell lines, from which osteoclasts derive; these cells, through their action on mineral component resorption of both bone tissue and OsteoBiol® biomaterials, can draw, activate and collaborate with osteoblasts in bone rearranging and remodeling.

3. Angiogenesis
The drawn monocytes/macrophages, in their turn, stimulate both osteoblastic activity and angiogenesis process in grafting site.

4. Osteoblastic activity
Collagen, binding to fibronectin, promotes the anchorage of mesenchymal stem progenitors, on which it exerts its chemotactic action, and induces differentiation into osteoblasts[4,5].

5. Receiving site remodeling
Exogenous collagen grafting can contribute in decreasing remodeling times of immature bone tissue.

6. Osteoconduction and guided regeneration
Naturally integrated with mineral component, collagen is able to increase osteoblasts proliferation rate while as a resorbable membrane it is able to guide connective tissue regeneration.

BIBLIOGRAPHY

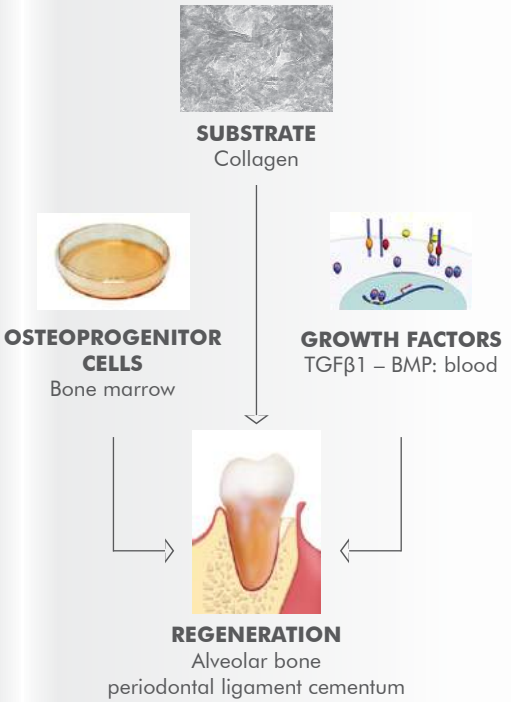
(1) GRIFFITH LG, NAUGHTON G
TISSUE ENGINEERING-CURRENT CHALLENGES AND EXPANDING OPPORTUNITIES
SCIENCE 2002, 295:1009-14

(2) REDDI AH
MORPHOGENESIS AND TISSUE ENGINEERING OF BONE AND CARTILAGE: INDUCTIVE SIGNALS, STEM CELLS, AND BIOMIMETIC BIOMATERIALS
TISSUE ENG 2000, 6(4):351-59

(3) NAKASHIMA N, REDDI AH
THE APPLICATION OF BONE MORPHOGENETIC PROTEINS TO DENTAL TISSUE ENGINEERING
NAT BIOTECHNOL 2003, 9:1025-32

(4) SALASZNYK RM, WILLIAMS WA, BOSKEY A, BATORSKY A, PLOPPER GE
ADHESION TO VITRONECTIN AND COLLAGEN I PROMOTES OSTEOGENIC DIFFERENTIATION OF HUMAN MESENCHYMAL STEM CELLS
J BIOMED BIOTECHNOL 2004, 1:24-34

(5) BRUNELLI G, SOLLAZZO V, CARINCI F, PALMIERI A, GIRARDI A, MONGUZZI R
OSTEOBIOL® INFLUENCES OSTEOGENIC DIFFERENTIATION OF ADIPOSE DERIVED STEM CELLS
EUR J INFLAMMAT, 2011, VOL. 9, NO. 3(S), 103-107



From heterologous bone to biomaterial

RESULTS OF INORGANIC CHEMICAL ANALYSES PERFORMED ON OSTEOBIOL® GEN-OS®

Chemical element	OsteoBiol® *Gen-Os*® (% in weight)
Ca	25.7%
PO_4^{3-}	35.2%
C	13.6%
H	2.2%
N	2.9%
O (not in PO_4^{3-})	20.4%
TOTAL	**100.0%**
Ca/P (n:n)	1.73

Mineral component 73.6%

Organic matrix 22.4%

Water 4.0%

Inorganic chemical analyses results
Source: University of Duisburg-Essen, Germany

RESULTS OF ORGANIC CHEMICAL ANALYSES PERFORMED ON OSTEOBIOL® GEN-OS®

"The separated proteins (one lane) were fractionated in ten portions and analysed with nano-LC-ESI MS/MS. In the fractions 1-5 in the range from 20-200kDa we found ONLY COLLAGEN. In the fractions 6-10 we identify NO PROTEIN"

Organic chemical analyses results
Source: Proteome Factory, Germany

A biomaterial for the reconstruction of bone defects must be biocompatible and have good handling and modeling properties; in specific clinical situations, it must also provide sufficient resistance to loading. Tecnoss® laboratories are specialized in processing heterologous bony and collagenic tissues. OsteoBiol® bone process, in particular, has been developed to modify but maintain the original collagen matrix of heterologous tissue, in order to preserve its positive biological functions, obtaining at the same time complete biocompatibility[1,2]. Most biomaterials are inert products that do not interfere, or rather, do not take part in the physiology of bone remodeling: since they have been developed according to the sole concept of biocompatibility, their function is limited only to preservation of the graft volume (scaffold). The concept of biocompatibility by itself has an essential purpose in the implant of permanent prosthetic elements inside the human body, but it is extremely restrictive in case of materials used for bone reconstruction.
OsteoBiol® biomaterials, being gradually resorbed and replaced by abundant newly formed bone over time, create the ideal conditions for the osseointegration of dental implants at re-entry.

(1) FIGUEIREDO M, HENRIQUES J, MARTINS G, GUERRA F, JUDAS F, FIGUEIREDO H
PHYSICOCHEMICAL CHARACTERIZATION OF BIOMATERIALS COMMONLY USED IN DENTISTRY AS BONE SUBSTITUTES - COMPARISON WITH HUMAN BONE
J BIOMED MATER RES B APPL BIOMATER, 2010 FEB; 92(2):409-19

(2) NANNMARK U, SENNERBY L
THE BONE TISSUE RESPONSES TO PREHYDRATED AND COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS: A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2008 DEC;10(4):264-70.

OsteoBiol®: the most complete products range

The extensive OsteoBiol® range of products are engineered to help surgeons making the right decision when it comes to choose the perfect product for a specific clinical indication, both in dental and maxillofacial surgery.

Tecnoss® development of new products or improvement of existing ones, have a focus on supporting the technical capabilities of the practitioner to improve both intraoperative techniques and clinical results.

Specialists and researchers share their experience, blending clinical background and hands-on experience with the most advanced bio-technologies: the main goal is to obtain a specific solution to satisfy each clinical need.

OsteoBiol® collagenated grafting materials contribute to mineral deposition, vascular ingrowth and growth factor binding, thus providing a favourable enviroment for bone regeneration. The scientific literature has demostrated that OsteoBiol® bone matrix is similar to human bone, and it has been reported in humans to be osteoconductive, well integrated in the host site and partially resorbed after 5-6 months, with no signs of adverse reaction.

CERTIFICATIONS

Certifications CE certificates

Organismo Notificato 0373
Notified Body 0373

Istituto Superiore di Sanità

Certificato n° EPG-0009-16 Addendum n° 01-16

ESAME CE DELLA PROGETTAZIONE DEL PRODOTTO

EC DESIGN-EXAMINATION CERTIFICATE

Matrice ossea e collagenica- OsteoBiol, sterile / Collagenated bone matrix- OsteoBiol, sterile

fabbricato da / manufactured by

TECNOSS S.r.l.

Sede Legale/ Registered Offices: Via Morgheu, 34- 10100 Torino (TO) ITALIA

Annex II | Porcine and Equine Bone Matrix
Source: Tecnoss® s.r.l.

Organismo Notificato 0373
Notified Body 0373

Istituto Superiore di Sanità

Certificato n° EPG-0008-16 Addendum n° 03-16

ESAME CE DELLA PROGETTAZIONE DEL PRODOTTO

EC DESIGN-EXAMINATION CERTIFICATE

Membrane essiccate- OsteoBiol, steriti / Membranes- OsteoBiol, sterile

fabbricato da / manufactured by

TECNOSS S.r.l.

Sede Legale/ Registered Offices: Via Morgheu, 34- 10100 Torino (TO) ITALIA

Annex II | Porcine and Equine Membranes
Source: Tecnoss® s.r.l.

Organismo Notificato 0373
Notified Body 0373

Istituto Superiore di Sanità

Certificato n° EPG-0007-16 Addendum n° 01-16

ESAME CE DELLA PROGETTAZIONE DEL PRODOTTO

EC DESIGN-EXAMINATION CERTIFICATE

Feltri e Membrane di collagene equino, sterili – OsteoBiol, sterili/ Equine lyophilized collagen felt and membrane, sterile – OsteoBiol, sterile

fabbricato da / manufactured by

TECNOSS S.r.l.

Sede Legale/ Registered Offices: Via Morgheu, 34- 10100 Torino (TO) ITALIA

Annex II | Equine Felts
Source: Tecnoss® s.r.l.

Organismo Notificato 0373
Notified Body 0373

Istituto Superiore di Sanità

Certificato n° QCT-0017-16 Addendum n° 01-16

DICHIARAZIONE CE DI CONFORMITA' SISTEMA COMPLETO DI GARANZIA DI QUALITA'

EC DECLARATION OF CONFORMITY FULL QUALITY ASSURANCE SYSTEM

TECNOSS S.r.l.

Sede Legale/ Registered Offices: Via Morgheu, 34- 10100 Torino (TO) ITALIA

per il dispositivo/ for the device(s)

Annex II | Full Quality Assurance System
Source: Tecnoss® s.r.l.

Biocompatibility test *Gen-Os®*

In order to analyze the biocompatibility of OsteoBiol® grafting materials, a battery of in vitro and animal tests was performed at Biolab S.p.A laboratory (Vimodrone, Milano, Italy), in conformity with Good Laboratory Practice (GLP – certification number 158/245/05; Ministry of Health Decree 10th March 2005).

DIRECT CONTACT CYTOTOXICITY

AIM: cytotoxic potential evaluation of OsteoBiol® *Gen-Os®* grafting material

MATERIALS AND METHODS

The direct contact cytotoxicity test was performed on a culture at confluence of murine fibroblasts belonging to NCTC L929 clone (Lgc Promochem, Teddington, Middlesex, UK) in exponential growth phase. An eluate with culture Medium was prepared, by dipping the study material in culture Medium to obtain a 0,2g/ml weight/volume ratio. The assay sample was incubated for 72 hours at 37°C ±1°C temperature. Then, 2ml extract was incubated with cultured NCTC L929 cells for a period of 48 hours in incubator at 37°C ±1°C temperature, with CO_2 atmosphere in air.

RESULTS

After 24 hours of incubation, no cytotoxic reaction is detectable in cultured treated cells; in fact there is no presence of both cells lacking intra-cytoplasmatic granulations and areas characterized by wide cellular lysis (reactivity grade: 0.00).

CONCLUSIONS

As stated in UNI EN ISO 10993: 5, 2000 rule, OsteoBiol® Gen-Os® study material must be considered as NON CYTOTOXIC.

INTRACUTANEOUS REACTIVITY

AIM: local toxic effects evaluation of OsteoBiol® *Gen-Os®* grafting material

MATERIALS AND METHODS

A intracutaneous reactivity assay on rabbit was performed. 2 eluates of study material were prepared using as extraction liquids vegetable oil or saline. The extracts were obtained under static conditions by dipping the study material in saline or vegetable oil to reach a 0.2g/ml weight/volume ratio. Each assay sample was incubated for 72 hours at 37°C ±1°C temperature. 0.2ml of each extract was subcutaneously injected in 3 rabbits to evaluate macroscopic signs of cutaneous irritation such as erythema, oedema and eschars.

RESULTS

During all observation period, no signs of erythema, oedema and eschars were detected in treated rabbits.

CONCLUSIONS

OsteoBiol® *Gen-Os®* study material satisfies the assay conditions, in fact all LOCAL TOXIC EFFECTS were ABSENT, as stated in UNI EN ISO 10993-10:2004 rule.

SYSTEMIC TOXICITY

AIM: toxic systemic effects evaluation of OsteoBiol® *Gen-Os®* grafting material

MATERIALS AND METHODS

2 eluates of study material were prepared using as extraction liquids vegetable oil or saline. The extracts were obtained under static conditions by dipping the study material in saline or vegetable oil to reach a 0.2g/ml weight/volume ratio. Each assay sample was incubated for 72 hours at 37°C ±1°C temperature. 50mg/Kg of saline extract was subcutaneously injected in a group of 5 mice and 50mg/Kg of vegetable oil extract was intra-peritoneally administered to a group of 5 mice. All noticed symptoms in treated animals during the following 72 hours of observation were surveyed and registered.

RESULTS

None of mice treated with saline or vegetable oil extracts from study material showed toxic symptoms.

CONCLUSIONS

On the base of results obtained, interpreted as stated in UNI EN ISO 10993-11:1997 rule, OsteoBiol® Gen-Os® grafting material can be considered as NON TOXIC.

DELAYED HYPERSENSITIVITY

AIM: sensitizing effects analysis of OsteoBiol® *Gen-Os®* grafting material

MATERIALS AND METHODS

2 eluates of study material were prepared using as extraction liquids vegetable oil or saline. The extracts were obtained under static conditions by dipping the study material in saline or vegetable oil to reach a 0.2g/ml weight/volume ratio. Each assay sample was incubated for 72 hours at 37°C ±1°C temperature. 15 guinea-pigs were used for each eluate analysis, whom 10 were treated with each study material extract and 5 as controls. Cutaneous sensitization assay is characterized by an induction phase and by a challenge phase.

Induction phase | During induction phase the group of 10 treated guinea-pigs was inoculated with 3 couples (0,1ml each) of intradermal injections as follows:

1°: Complete Freund Adjuvant (FCA) in deionized water (1:1 ratio)

2°: study material eluate

3°: study material eluate + FCA (1:1 ratio).

5 control guinea-pigs received the same injection couples as treated group, but in the 2nd injection only extraction liquid was inoculated (vegetable oil and saline) and in the 3rd injection extraction liquid + FCA (1:1 ratio). After 6 days from intradermal injection in both treated and control animals, a topical application through massage of 0.5ml Sodium Lauryl Sulfate at 10%. After 7 days from intradermal injection, on the skin of 10 treated animals the study material extract was applied in a volume of 0.5ml/animal for a incubation period of 48 hours. The same treatment was performed in the control group, using the respective extraction liquid.

Challenge phase | After 21 days from the beginning of treatment, on all treated and control animals the challenge phase was induced, by applying on the right side of their back 0.5ml of study material extract and on their left side the respective extraction liquid (vegetable oil or saline). The bandages were left in site for 24 hours. After 24 and 48 hours from bandages removal all reactions of both treated and control animals were evaluated.

RESULTS

No reactions of erythema and/or oedema were detectable in both treated and control animals.

CONCLUSIONS

On the base of results obtained, interpreted as stated in UNI EN ISO 10993-10:2002 rule, OsteoBiol® Gen-Os® study material must be defined as NON SENSITIZING.

SALMONELLA TYPHIMURIUM REVERSION

AIM: mutagenesis effects analysis of OsteoBiol® *Gen-Os®* grafting material

MATERIALS AND METHODS

Salmonella typhimurium assay (reversion of mutation) was performed on 5 mutant strains of Salmonella typhimurium (TA1535, TA1537, TA98, TA100, TA102). The mutagenic activity of study material was defined by the computation of revertant colonies of test cultures in comparison with the number of revertant colonies of control cultures. This activity was evaluated both in presence or absence of an enzymatic system of metabolic activation with the method of direct incorporation into plate. For the assay, 2 eluates of study material were prepared using saline or DMSO as extraction liquids. The extracts were obtained under static conditions by dipping the study material in saline or DMSO to reach a 0.2g/ml weight/volume ratio. Each assay sample was incubated for 72 hours at 37°C ±1°C temperature.

RESULTS

The analysis performed on test strains (incubation with study material eluates) about genetic characteristics demonstrated the maintenance of required genetic characters. Moreover, the study material extracts were both non toxic nor harmful on bacteria used for assays.

CONCLUSIONS

As stated in ISO 10993-11:1993 rule, OsteoBiol® Gen-Os® study material was NON MUTAGENIC, both in presence or absence of metabolic activation.

Biocompatibility test *Evolution*

DIRECT CONTACT CYTOTOXICITY

AIM: cytotoxic potential evaluation of OsteoBiol® *Evolution* resorbable membrane

MATERIALS AND METHODS

The direct contact cytotoxicity test was performed on a culture at confluence of murine fibroblasts belonging to NCTC L929 clone (Lgc Promochem) in exponential growth phase. The study material was incubated with cultured NCTC L929 cells in monolayer for a period of 24 hours in incubator at 37°C ±1°C temperature, with CO_2 atmosphere in air. After 24 hours incubation, the cell culture was observed to evaluate biological reactivity.

RESULTS

After 24 hours of direct contact in cultured treated cells, no areas, under or surrounding the material, was deformed and/or degenerated (reactivity grade: 0.00).

CONCLUSIONS

As stated in UNI EN ISO 10993: 5, 2000 rule, OsteoBiol® Evolution resorbable membrane must be considered as NON CYTOTOXIC.

INTRACUTANEOUS REACTIVITY TEST

AIM: local toxic effects evaluation of OsteoBiol® *Evolution* resorbable membrane

MATERIALS AND METHODS

A intracutaneous reactivity assay on rabbit was performed. 2 eluates of study material were prepared using as extraction liquids vegetable oil or saline. The extracts were obtained under static conditions by dipping the study material in saline or vegetable oil to reach a 6cm²/ml surface/volume ratio. Each assay sample was incubated for 72 hours at 37°C ±1°C temperature. 0.2ml of each extract were subcutaneously injected in 3 rabbits to evaluate macroscopic signs of cutaneous irritation such as erythema, oedema and eschars.

RESULTS

During all observation period, no signs of erythema, oedema and eschars were detected in treated rabbits.

CONCLUSIONS

OsteoBiol® Evolution resorbable membrane satisfies the assay conditions, in fact all LOCAL TOXIC EFFECTS were ABSENT, as stated in UNI EN ISO 10993-10:2004 rule.

SYSTEMIC TOXICITY TEST

AIM: systemic toxicity effects evaluation of OsteoBiol® *Evolution* resorbable membrane

MATERIALS AND METHODS

2 eluates of study material were prepared using as extraction liquids vegetable oil or saline. The extracts were obtained under static conditions by dipping the study material in saline or vegetable oil to reach a 6cm²/ml surface/volume ratio. Each assay sample was incubated for 72 hours at 37°C ±1°C temperature. 50mg/Kg of saline extract was subcutaneously injected in a group of 5 mice and 50mg/Kg of vegetable oil extract was intra-peritoneally administered to a group of 5 mice. All noticed symptoms in treated animals during the following 72 hours of observation were surveyed and registered.

RESULTS

None of mice treated with saline or vegetable oil extracts from study membrane showed toxic symptoms.

CONCLUSIONS

On the base of results obtained, interpreted as stated in UNI EN ISO 10993-11:1997 rule, OsteoBiol® Evolution resorbable membrane can be considered as NON TOXIC.

DELAYED HYPERSENSITIVITY

AIM: sensitizing effects analysis of OsteoBiol® *Evolution* resorbable membrane

MATERIALS AND METHODS

2 eluates of study material were prepared using as extraction liquids vegetable oil or saline. The extracts were obtained under static conditions by dipping the study material in saline or vegetable oil to reach a 6cm²/ml surface/volume ratio. Each assay sample was incubated for 72 hours at 37°C ±1°C temperature. 15 guinea-pigs were used for each eluate analysis, whom 10 were treated with each study material extract and 5 as controls. Cutaneous sensitization assay is characterized by an induction phase and by a challenge phase.

Induction phase | During induction phase the group of 10 treated guinea-pigs was inoculated with 3 couples (0.1ml each) of intradermal injections as follows:

1°: Complete Freund Adjuvant (FCA) in deionized water (1:1 ratio)

2°: study material eluate

3°: study material eluate + FCA (1:1 ratio)

5 control guinea-pigs received the same injection couples as treated group, but in the 2nd injection only extraction liquid was inoculated (vegetable oil and saline) and in the 3rd injection extraction liquid + FCA (1:1 ratio). After 6 days from intradermal injection in both treated and control animals, a topical application through massage of 0.5ml Sodium Lauryl Sulfate at 10%. After 7 days from intradermal injection, on the skin of 10 treated animals the study material extract was applied in a volume of 0.5ml/animal for a incubation period of 48 hours. The same treatment was performed in the control group, using the respective extraction liquid.

Challenge phase | After 21 days from the beginning of treatment, on all treated and control animals the challenge phase was induced, by applying on the right side of their back 0.5ml of study material extract and on their left side the respective extraction liquid (vegetable oil or saline). The bandages were left in site for 24 hours. After 24 and 48 hours from bandages removal all reactions of both treated and control animals were evaluated.

RESULTS

No reactions of erythema and/or oedema were detectable in both treated and control animals.

CONCLUSIONS

On the base of results obtained, interpreted as stated in UNI EN ISO 10993-10:2002 rule, OsteoBiol® Evolution resorbable membrane must be defined as NON SENSITIZING.

SALMONELLA TYPHIMURIUM REVERSION

AIM: mutagenesis effects analysis of OsteoBiol® *Evolution* resorbable membrane

MATERIALS AND METHODS

Salmonella typhimurium assay (reversion of mutation) was performed on 5 mutant strains of Salmonella typhimurium (TA1535, TA1537, TA98, TA100, TA102). The mutagenic activity of study material was defined by the computation of revertant colonies of test cultures in comparison with the number of revertant colonies of control cultures. This activity was evaluated both in presence or absence of an enzymatic system of metabolic activation with the method of direct incorporation into plate. For the assay, 2 eluates of study material were prepared using saline or DMSO as extraction liquids. The extracts were obtained under static conditions by dipping the study material in saline or DMSO to reach a 6cm²/ml surface/volume ratio. Each assay sample was incubated for 72 hours at 37°C ±1°C temperature.

RESULTS

The analysis performed on test strains (incubation with study material eluates) about genetic characteristics demonstrated the maintenance of required genetic characters. Moreover, the study material extracts were both non toxic nor harmful on bacteria used for assays.

CONCLUSIONS

As stated in ISO 10993-11:1993 rule, OsteoBiol® Evolution resorbable membrane was NON MUTAGENIC, both in presence or absence of metabolic activation.

Biocompatibility test *mp3®*

DIRECT CONTACT CYTOTOXICITY

AIM: cytotoxic potential evaluation of OsteoBiol® *mp3®* grafting material

MATERIALS AND METHODS

The cytotoxicity direct contact test was performed on a confluent NCTC L929 (Mammal fibroblasts ATCC CCL1 NCTC Clone L929) cell culture in exponential phase of growth.
The test product was applied to the monolayer of NCTC L929 and was incubated at 37°C ±1°C in CO_2 atmosphere for 24 hours. After 24 hours of incubation the cells cultures were observed to evaluate the biological reactivity (cell degeneration and malformations).

RESULTS

After 24hrs of contact, in the cells treated with test product no detectable malformed or degenerated zone around or under specimen was observed (reactivity grade 0).

CONCLUSIONS

On the basis of the results, interpreted according to EN ISO 10993-5:2009, the test product must be considered NOT CYTOTOXIC.

DELAYED HYPERSENSITIVITY

AIM: hypersensitivity effects evaluation of OsteoBiol® *mp3®* grafting material

MATERIALS AND METHODS

Two extracts of the test product were prepared both in vegetable oil and in physiological solution in order to perform the tests for delayed-type hypersensivity. The extracts of the test product were performed by submerging the test sample into both solvents. Then the test sample was incubated for 72 hours at temperature of 37°C ±1°C in dynamic conditions. For each extract guinea pigs were used. The test is characterized by an induction phase and challenge phase. In induction phase, the guinea pigs were treated with intradermal injections. 6 days after the beginning of treatment on the all animals, a topical application was performed. After 7 days from the intradermal injections, the extracts of test product were applied. The application lasted 48 hours. The same treatment was performed on control guinea pigs using only extraction liquid. The challenge phase, 21 days after the beginning of treatment, was performed applying by an occlusive patch on all the animals about 1ml of the extract on the left side and about 1ml of the solvent on the right side. The patch was left on for 24 hours. 48 and 72 hours after the beginning of this phase, the tested animals and the control animals were observed. No abnormalities were observed in the animals used as treated and as control. On the basis of the results, interpreted according to EN ISO 10993-10:2002, the test product can be considered NON SENSITIZING.

RESULTS

No abnormalities were observed in the animals used as treated and as control.

CONCLUSIONS

On the basis of the results, interpreted according to EN ISO 10993-10:2002, the test product can be considered NON SENSITIZING.

INTRACUTANEOUS REACTIVITY

AIM: local toxic effects evaluation of OsteoBiol® *mp3®* grafting material

MATERIALS AND METHODS

An intracutaneous reactivity assay on albino rabbit was performed. Two extracts of test product were prepared using physiological solution and vegetable oil as liquid of extraction. The extracts of the test product were performed by submerging the test sample into both solvents. Then the test sample was incubated for 72 hours at temperature of 37°C ±1°C in dynamic conditions. Each extract were intracutaneously injected in albino rabbits. All animals have been observed at 24, 48 and 72 hours for injection for evaluated each toxic symptom and macroscopical skin reactions, as erythema, oedema and eschar.

RESULTS

During the study, all the treated sites showed no sign of erythema nor sign of oedema. All the control sites showed no sign of erythema nor sign of oedema.

CONCLUSIONS

On the basis of the results, interpreted according to EN ISO 10993-10:2002, the test product SATISFIES the requirements of the test.

SALMONELLA TYPHIMURIUM REVERSE MUTATION

AIM: mutagenesis effects evaluation of OsteoBiol® *mp3®* grafting material

MATERIALS AND METHODS

The test was performed on five mutant strains of Salmonella typhimurium (TA1535, TA1537, TA98, TA100, TA102). The mutagenic activity of the test sample was determined by comparing number of reverting colonies with the number of the reverting organisms in the control cultures. The extracts of the test product were performed by submerging the test sample into physiological solution and DMSO. Then the sample was incubated for 72 hours at temperature of 37°C ±1°C in dynamic conditions.

RESULTS

No increase in the number of revertant colonies per plate in any strain with or without metabolic activation system was detected.

CONCLUSIONS

On the basis of results, evaluated according to EN ISO 10993-3:2003, the test product, undergone to Ames test, is NON-MUTAGENIC either in the presence or absence of metabolic activation.

SYSTEMIC TOXICITY

AIM: systemic toxic effects evaluation of OsteoBiol® *mp3®* grafting material

MATERIALS AND METHODS

In the acute systemic toxicity test two extracts of test device were prepared using physiological solution and vegetable oil as liquid of extraction. The extracts of the test product were performed by submerging the test sample into both solvents. Then the test sample was incubated for 72 hours at temperature of 37°C ±1°C in dynamic conditions. An extract of test device in physiological solution was intravenous injected in a group of mice and other extract in vegetable oil was intraperitoneally injected in other group of mice. All animals were observed immediately after injection and after 4, 24, 48 and 72 hours for evaluated each symptom as tremors, convulsions, tachycardia, etc.

RESULTS

In none of the treated animals toxic signs or symptoms were observed.

CONCLUSIONS

On the basis of the results, interpreted according to EN ISO 10993-11:2006, the test product must be considered NON TOXIC.

IN BONE IMPLANT

AIM: osteogenesis activity evaluation of OsteoBiol® *mp3®* grafting material

MATERIALS AND METHODS

In bone implant test, the test samples were implanted in three sites of right femur of 4 white rabbits; USP Reference Standard Negative Control Plastic were implanted in three sites of the controlateral side. Animals were sacrificed after 4 and 12 weeks. At the end of the study, histopathology of the implanted sites (for each animal 1 treated site and 1 control site) were performed.

RESULTS

After 4 weeks the bone holes treated with the test sample showed an active neo-osteogenesis. After 12 weeks the treated bone holes were completely closed.

UNI EN ISO 13485 KIWA CERMET quality certificate

Certificate

kiwa
Partner for progress

Reg. Number 10776 - M
Issuing date 2007-01-15 Last modification date 2015-12-23
Following renewal date 2019-01-14

Quality Management System Certificate
ISO 13485:2012

We certify that the Quality Management System of the Organization:

TECNOSS S.r.l.

Is in compliance with the standard UNI CEI EN ISO 13485:2012 for the following products/services:

Manufacturing of bone substitutes, membranes and collagen felts for bone and tissue regeneration.

Chief Operating Officer
Giampiero Belcredi

Maintenance of the certification is subject to annual survey and dependent upon the observance of Kiwa Cermet Italia contractual requirements.

This certificate consists of 1 page.

TECNOSS S.r.l.
Piazza Papa Giovanni XXIII, 2
10094 Giaveno TO Italia

- *Via Monte Nero 13 10050 Coazze (TO) Italia*

Kiwa Cermet Italia S.p.A.
Società con socio unico, soggetta all'attività di direzione e coordinamento di Kiwa Italia Holding Srl
Via Cadriano, 23
40057 Granarolo dell'Emilia (BO)
Tel +39.051.459.3.111
Fax +39.051.753.382
E-mail: info@kiwacermet.it
www.kiwacermet.it

CERMET

IAF

ACCREDIA
SGQ N° 007A SSI N° 006G
SGA N° 010D FSM N° 004I
PRD N° 069B

REGULATIONS ON MANUFACTURING PROCESS

UNI EN ISO 13485:2012
Medical devices – Quality management systems – Requirements for regulatory purposes

DIRECTIVE 93/42/CEE and relative amendments

UNI CEI EN ISO 14971:2012
"Application of risk management to medical devices"

UNI EN ISO 10993-1:2010
"Biological evaluation to medical devices. Part 1: Evaluation and testing"

UNI EN ISO 22442-3:2007
"Animal tissues and their derivatives utilized in the manufacture of medical devices"

UNI EN ISO 22442-2:2007
Medical devices utilizing animal tissues and their derivatives - Part 2: Controls on sourcing, collection and handling

UNI EN ISO 22442-1:2007
Medical devices utilizing animal tissues and their derivatives - Part 1: Application of risk management

UNI EN ISO 11137-1:2015
"Sterilization of health care products - Radiation - Part 1: Requirements for development, validation and routine control of a sterilization process for medical devices"

UNI EN ISO 11137-2:2015
"Sterilization of health care products - Radiation - Part 2: Establishing the sterilization dose"

UNI EN 556-1:2006
"Sterilization of medical devices. Requirements for medical devices to be designated "STERILE". Requirements for terminally sterilized medical devices"

NEW FREE APP
for smartphone, iPhone, tablet and iPad including:

8 animations to show your patients the main GBR techniques

Information about the full range of OsteoBiol® biomaterials

Direct access to the database of clinical videos and cases on osteobiol.com

Available on the App Store

Get it on Google play

This App may be too large to download over a mobile connection, or may exceed data usage limits. Wi-Fi connection recommended.

• international distributors

Collagenated biomaterials

OsteoBiol®
by Tecnoss

Distributed in 80 countries
120 international scientific publications
18 years of clinical success
Over 500.000 surgeries performed

Available on the App Store

Get it on Google play

REGENERATION SCIENCE

INSPIRED BY NATURE

LITERATURE


OsteoBiol®
by Tecnoss
SCIENTIFIC ABSTRACTS
REGENERATION SCIENCE
INSPIRED BY NATURE
LATERAL ACCESS SINUS LIFT
LASL
LAS
ALR

COVANI U, AMERI S, CRESPI R, BARONE A
PRESERVAZIONE DEL PROCESSO ALVEOLARE CON OSSO ETEROLOGO. CONSIDERAZIONI ISTOLOGICHE
ITALIAN ORAL SURGERY, 2004, VOL 3, 1: 17-23

CASSETTA M, CALASSO S, VOZZA I, DELL'AQUILA D
REHABILITATION OF ATROPHIC ALVEOLAR CRESTS WITH CYLINDRICAL SANDBLASTED AND ACID ETCHED IMPLANTS: A PILOT STUDY
EUR J IMPLANT PROSTHODONTICS, 2005;(3)1:133-144

ARCURI C, CECCHETTI F, GERMANO F, MOTTA A, SANTACROCE C
CLINICAL AND HISTOLOGICAL STUDY OF A XENOGENIC BONE SUBSTITUTE USED AS A FILLER IN POSTEXTRACTIVE ALVEOLUS
MINERVA STOMATOL, 2005 JUN;54(6):351-62

BARONE A, CRESPI R, ALDINI NN, FINI M, GIARDINO R, COVANI U
MAXILLARY SINUS AUGMENTATION: HISTOLOGIC AND HISTOMORPHOMETRIC ANALYSIS
INT J ORAL MAXILLOFAC IMPLANTS, 2005 JUL-AUG; 20(4):519-25

RINNA C, UNGARI C, SALTAREL A, CASSONI A, REALE G
ORBITAL FLOOR RESTORATION
J CRANIOFAC SURG, 2005 NOV; 16(6):968-72

BARONE A, AMERI S, COVANI U
IMMEDIATE POSTEXTRACTION IMPLANTS: TREATMENT OF RESIDUAL PERI-IMPLANT DEFECTS. A RETROSPECTIVE ANALYSIS
EUR J IMPLANT PROSTHODONTICS, 2006,2: 99-106

BARONE A, SANTINI S, SBORDONE L, CRESPI R, COVANI U
A CLINICAL STUDY OF THE OUTCOMES AND COMPLICATIONS ASSOCIATED WITH MAXILLARY SINUS AUGMENTATION
INT J ORAL MAXILLOFAC IMPLANTS, 2006 JAN-FEB; 21(1):81-5

COVANI U, BARONE A, CORNELINI R, CRESPI R
CLINICAL OUTCOME OF IMPLANTS PLACED IMMEDIATELY AFTER IMPLANT REMOVAL
J PERIODONTOL, 2006 APR;77(4):722-7

ORSINI G, SCARANO A, PIATTELLI M, PICCIRILLI M, CAPUTI S, PIATTELLI A
HISTOLOGIC AND ULTRASTRUCTURAL ANALYSIS OF REGENERATED BONE IN MAXILLARY SINUS AUGMENTATION USING A PORCINE BONE-DERIVED BIOMATERIAL
J PERIODONTOL, 2006 DEC;77(12):1984-90

TRUBIANI O, SCARANO A, ORSINI G, DI IORIO D, D'ARCANGELO C, PICCIRILLI M, SIGISMONDO M, CAPUTI S
THE PERFORMANCE OF HUMAN PERIODONTAL LIGAMENT MESENCHYMAL STEM CELLS ON XENOGENIC BIOMATERIALS
INT J IMMUNOPATHOL PHARMACOL, 2007 JAN-MAR; 20 (1 SUPPL 1):87-91

BARONE A, COVANI U
MAXILLARY ALVEOLAR RIDGE RECONSTRUCTION WITH NON- VASCULARIZED AUTOGENOUS BLOCK BONE: CLINICAL RESULTS
J ORAL MAXILLOFAC SURG, 2007 OCT;65(10):2039-46

DEL CORSO M
SOFT TISSUE RESPONSE TO PLATELET RICH FIBRIN: CLINICAL EVIDENCES
COSMETIC DENTISTRY, 2008, 3:16-20

BARONE A, SANTINI S, MARCONCINI S, GIACOMELLI L, GHERLONE E, COVANI U
OSTEOTOMY AND MEMBRANE ELEVATION DURING THE MAXILLARY SINUS AUGMENTATION PROCEDURE. A COMPARATIVE STUDY: PIEZOELECTRIC DEVICE VS. CONVENTIONAL ROTATIVE INSTRUMENTS
CLIN ORAL IMPLANTS RES, 2008 MAY;19(5):511-5

BARONE A, CORNELINI R, CIAGLIA R, COVANI U
IMPLANT PLACEMENT IN FRESH EXTRACTION SOCKETS AND SIMULTANEOUS OSTEOTOME SINUS FLOOR ELEVATION: A CASE SERIES
INT J PERIODONTICS RESTORATIVE DENT, 2008 JUN; 28(3):283-9

BARONE A, ALDINI NN, FINI M, GIARDINO R, CALVO GUIRADO JL, COVANI U
XENOGRAFT VERSUS EXTRACTION ALONE FOR RIDGE PRESERVATION AFTER TOOTH REMOVAL: A CLINICAL AND HISTOMORPHOMETRIC STUDY
J PERIODONTOL, 2008 AUG;79(8):1370-7

COVANI U, CORNELINI R, BARONE A
BUCCAL BONE AUGMENTATION AROUND IMMEDIATE IMPLANTS WITH AND WITHOUT FLAP ELEVATION: A MODIFIED APPROACH
INT J ORAL MAXILLOFAC IMPLANTS, 2008 SEP-OCT; 23(5):841-6

CARDAROPOLI D, CARDAROPOLI G
PRESERVATION OF THE POSTEXTRACTION ALVEOLAR RIDGE: A CLINICAL AND HISTOLOGIC STUDY
INT J PERIODONTICS RESTORATIVE DENT, 2008 OCT; 28(5):469-77

NANNMARK U, SENNERBY L
THE BONE TISSUE RESPONSES TO PREHYDRATED AND COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS: A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2008 DEC;10(4):264-70

SCARANO A, PIATTELLI M, CARINCI F, PERROTTI V
REMOVAL, AFTER 7 YEARS, OF AN IMPLANT DISPLACED INTO THE MAXILLARY SINUS. A CLINICAL AND HISTOLOGIC CASE REPORT
J OSSEOINTEGR, 2009;1(1):35-40

COVANI U, MARCONCINI S, CRESPI R, BARONE A
IMMEDIATE IMPLANT PLACEMENT AFTER REMOVAL OF A FAILED IMPLANT: A CLINICAL AND HISTOLOGICAL CASE REPORT
J ORAL IMPLANTOL, 2009; 35(4):189-95

FIGUEIREDO M, HENRIQUES J, MARTINS G, GUERRA F, JUDAS F, FIGUEIREDO H
PHYSICOCHEMICAL CHARACTERIZATION OF BIOMATERIALS COMMONLY USED IN DENTISTRY AS BONE SUBSTITUTES - COMPARISON WITH HUMAN BONE
J BIOMED MATER RES B APPL BIOMATER, 2010FEB; 92(2):409-19

GRENGA PL, REALE G, COFONE C, MEDURI A, CERUTI P, GRENGA R
HESS AREA RATIO AND DIPLOPIA: EVALUATION OF 30 PATIENTS UNDERGOING SURGICAL REPAIR FOR ORBITAL BLOW-OUT FRACTURE
OPHTHAL PLAST RECONSTR SURG, 2009 MAR-APR; 25(2):123-5

CRESPI R, CAPPARÈ P, GHERLONE E
DENTAL IMPLANTS PLACED IN EXTRACTION SITES GRAFTED WITH DIFFERENT BONE SUBSTITUTES: RADIOGRAPHIC EVALUATION AT 24 MONTHS
J PERIODONTOL, 2009 OCT; 80(10):1616-1621

RINNA C, REALE G, FORESTA E, MUSTAZZA MC
MEDIAL ORBITAL WALL RECONSTRUCTION WITH SWINE BONE CORTEX
J CRANIOFAC SURG, 2009 MAY; 20(3): 881-4

CARDAROPOLI D, CARDAROPOLI G
HEALING OF GINGIVAL RECESSIONS USING A COLLAGEN MEMBRANE WITH A THE MINERALIZED XENOGRAFT: A RANDOMIZED CONTROLLED CLINICAL TRIAL
INT J PERIODONTICS RESTORATIVE DENT, 2009 FEB; 29(1):59-67

NANNMARK U, AZARMEHR I
SHORT COMMUNICATION: COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS. A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2010 JUN 1; 12(2):161-3

SCARANO A, PIATTELLI A, ASSENZA B, QUARANTA A, PERROTTI V, PIATTELLI M, IEZZI G
PORCINE BONE USED IN SINUS AUGMENTATION PROCEDURES: A 5-YEAR RETROSPECTIVE CLINICAL EVALUATION
J ORAL MAXILLOFAC SURG, 2010 AUG; 68(8):1869-73

ROSSI R, MORALES RS, FRASCARIA M, BENZI R, SQUADRITO N
PLANNING IMPLANTS IN THE ESTHETIC ZONE USING A NEW IMPLANT 3D NAVIGATION SYSTEM
EUR J ESTHETIC DENT, 2010 SUMMER; 5(2):172-88

SCARANO A, CARINCI F, ASSENZA B, PIATTELLI M, MURMURA G, PIATTELLI A
VERTICAL RIDGE AUGMENTATION OF ATROPHIC POSTERIOR MANDIBLE USING AN INLAY TECHNIQUE WITH A XENOGRAFT WITHOUT MINISCREWS AND MINIPLATES: CASE SERIES
CLIN ORAL IMPLANTS RES, 2011 OCT;22(10):1125-30

PAGLIANI L, ANDERSSON P, LANZA M, NAPPO A, VERROCCHI D, VOLPE S, SENNERBY L
A COLLAGENATED PORCINE BONE SUBSTITUTE FOR AUGMENTATION AT NEOSS IMPLANT SITES: A PROSPECTIVE 1-YEAR MULTICENTER CASE SERIES STUDY WITH HISTOLOGY
CLIN IMPLANT DENT RELAT RES, 2012 OCT;14(5):746-58

SANTAGATA M, GUARINIELLO L, TARTARO G
A MODIFIED EDENTULOUS RIDGE EXPANSION (MERE) TECHNIQUE FOR IMMEDIATE PLACEMENT OF IMPLANTS. A CASE REPORT
J ORAL IMPLANTOL, 2011 MAR;37 SPEC N°:114-9

BARONE A, RICCI M, CALVO GUIRADO JL, COVANI U
BONE REMODELLING AFTER REGENERATIVE PROCEDURES AROUND IMPLANTS PLACED IN FRESH EXTRACTION SOCKETS: AN EXPERIMENTAL STUDY IN BEAGLE DOGS
CLIN ORAL IMPLANTS RES, 2011 OCT; 22(10):1131-7

SCARANO A, PIATTELLI A, PERROTTI V, MANZON L, IEZZI G
MAXILLARY SINUS AUGMENTATION IN HUMANS USING CORTICAL PORCINE BONE: A HISTOLOGICAL AND HISTOMORPHOMETRICAL EVALUATION AFTER 4 AND 6 MONTHS
CLIN IMPLANT DENT RELAT RES, 2011 MAR;13(1):13-18

CRESPI R, CAPPARÈ P, ROMANOS GE, MARIANI E, BENASCIUTTI E, GHERLONE E
CORTICOCANCELLOUS PORCINE BONE IN THE HEALING OF HUMAN EXTRACTION SOCKETS: COMBINING HISTOMORPHOMETRY WITH OSTEOBLAST GENE EXPRESSION PROFILES IN VIVO
INT J ORAL MAXILLOFAC IMPLANTS, 2011 JUL-AUG; 26(4):866-72

HINZE M, VRIELINCK L, THALMAIR T, WACHTEL H, BOLZ W
ZYGOMATIC IMPLANT PLACEMENT IN CONJUCTION WITH SINUS BONE GRAFTING: THE "EXTENDED SINUS ELEVATION TECHNIQUE". A CASE-COHORT STUDY
ORAL CRANIOFAC TISSUE ENG, 2011; 1:188-197

IEZZI G, DEGIDI M, PIATTELLI A, MANGANO C, SCARANO A, SHIBLI JA, PERROTTI V
COMPARATIVE HISTOLOGICAL RESULTS OF DIFFERENT BIOMATERIALS USED IN SINUS AUGMENTATION PROCEDURES: A HUMAN STUDY AT 6 MONTHS
CLIN ORAL IMPLANTS RES, 2012 DEC;23(12):1369-76

SLOTTE C, LINDFORS N, NANNMARK U
SURGICAL RECONSTRUCTION OF PERI-IMPLANT BONE DEFECTS WITH PREHYDRATED AND COLLAGENATED PORCINE BONE AND COLLAGEN BARRIERS: CASE PRESENTATIONS
CLIN IMPLANT DENT RELAT RES, 2013 OCT;15(5):714-23

BARONE A, RICCI M, GRASSI RF, NANNMARK U, QUARANTA A, COVANI U
A 6-MONTH HISTOLOGICAL ANALYSIS ON MAXILLARY SINUS AUGMENTATION WITH AND WITHOUT USE OF COLLAGEN MEMBRANES OVER THE OSTEOTOMY WINDOW: RANDOMIZED CLINICAL TRIAL
CLIN ORAL IMPLANTS RES, 2013 JAN; 24(1):1-6

SANTAGATA M, GUARINIELLO L, RAUSO R, TARTARO G
IMMEDIATE LOADING OF DENTAL IMPLANT AFTER SINUS FLOOR ELEVATION WITH OSTEOTOME TECHNIQUE: A CLINICAL REPORT AND PRELIMINARY RADIOGRAPHIC RESULTS
J ORAL IMPLANTOL, 2010 DEC; 36(6):485-489

FESTA VM, ADDABBO F, LAINO L, FEMIANO F, RULLO R
PORCINE-DERIVED XENOGRAFT COMBINED WITH A SOFT CORTICAL MEMBRANE VERSUS EXTRACTION ALONE FOR IMPLANT SITE DEVELOPMENT: A CLINICAL STUDY IN HUMANS
CLIN IMPLANT DENT RELAT RES, 2013 OCT;15(5):707-13

RAMIREZ FERNANDEZ MP, CALVO GUIRADO JL, MATÉ SANCHEZ DE VAL JE, DELGADO RUIZ RA, NEGRI B, BARONA DORADO C
ULTRASTRUCTURAL STUDY BY BACKSCATTERED ELECTRON IMAGING AND ELEMENTAL MICROANALYSIS OF BONE-TO-BIOMATERIAL INTERFACE AND MINERAL DEGRADATION OF PORCINE XENOGRAFTS USED IN MAXILLARY SINUS FLOOR ELEVATION
CLIN ORAL IMPLANTS RES, 2013 MAY;24(5):523-30

CASSETTA M, RICCI L, IEZZI G, DELL'AQUILA D, PIATTELLI A, PERROTTI V
RESONANCE FREQUENCY ANALYSIS OF IMPLANTS INSERTED WITH A SIMULTANEOUS GRAFTING PROCEDURE: A 5-YEAR FOLLOW-UP STUDY IN MAN
INT J PERIODONTICS RESTORATIVE DENT, 2012 OCT;32(5):581-9

BARONE A, ORLANDO B, CINGANO L, MARCONCINI S, DERCHI G, COVANI U
A RANDOMIZED CLINICAL TRIAL TO EVALUATE AND COMPARE IMPLANTS PLACED IN AUGMENTED VS. NON-AUGMENTED EXTRACTION SOCKETS. A 3-YEAR EVALUATION
J PERIODONTOL, 2012 JUL;83(7):836-46

ESPOSITO M, CANNIZZARO G, SOARDI E, PISTILLI R, PIATTELLI M, CORVINO V, FELICE P
POSTERIOR ATROPHIC JAWS REHABILITATED WITH PROSTHESES SUPPORTED BY 6 MM-LONG, 4 MM-WIDE IMPLANTS OR BY LONGER IMPLANTS IN AUGMENTED BONE. PRELIMINARY RESULTS FROM A PILOT RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2012 SPRING;5(1):19-33

FELICE P, PIANA L, CHECCHI L, PISTILLI R, PELLEGRINO G
VERTICAL RIDGE AUGMENTATION OF THE ATROPHIC POSTERIOR MANDIBLE WITH A 2-STAGE INLAY TECHNIQUE: A CASE REPORT
IMPLANT DENT, 2012 JUN;21(3):190-5

BARONE A, RICCI M, TONELLI P, SANTINI S, COVANI U
TISSUE CHANGES OF EXTRACTION SOCKETS IN HUMANS: A COMPARISON OF SPONTANEOUS HEALING VS. RIDGE PRESERVATION WITH SECONDARY SOFT TISSUE HEALING
CLIN ORAL IMPLANTS RES, 2013 NOV;24(11):1231-7

CASSETTA M, RICCI L, IEZZI G, CALASSO S, PIATTELLI A, PERROTTI V
USE OF PIEZOSURGERY DURING MAXILLARY SINUS ELEVATION: CLINICAL RESULTS OF 40 CONSECUTIVE CASES
INT J PERIODONTICS RESTORATIVE DENT, 2012 DEC;32(6):E182-8

BRUNELLI G, SOLLAZZO V, CARINCI F, PALMIERI A, GIRARDI A, MONGUZZI R
OSTEOBIOL® INFLUENCES OSTEOGENIC DIFFERENTIATION OF ADIPOSE DERIVED STEM CELLS
EUR J INFLAMMAT, 2011, VOL. 9, NO. 3 (S), 103-107

FELICE P, PIANA L, CHECCHI L, CORVINO V, NANNMARK U, PIATTELLI M
VERTICAL RIDGE AUGMENTATION OF ATROPHIC POSTERIOR MANDIBLE WITH AN INLAY TECHNIQUE AND CANCELLOUS EQUINE BONE BLOCK: A CASE REPORT
INT J PERIODONTICS RESTORATIVE DENT, 2013 MAR;33(2):159-66

FICKL S, JOCKEL-SCHNEIDER Y, LINCKE T, BECHTOLD M, FISCHER KR, SCHLAGENHAUF U
PORCINE DERMAL MATRIX FOR COVERING OF RECESSION TYPE DEFECTS: A CASE SERIES
QUINTESSENCE INT, 2013;44(3):243-6

SILVESTRI M, MARTEGANI P, D'AVENIA F, FARNETI M, CAPRI D, PAOLANTONI G, LANDI L
SIMULTANEOUS SINUS AUGMENTATION WITH IMPLANT PLACEMENT: HISTOMORPHOMETRIC COMPARISON OF TWO DIFFERENT GRAFTING MATERIALS. A MULTICENTER DOUBLE-BLIND PROSPECTIVE RANDOMIZED CONTROLLED CLINICAL TRIAL
INT J ORAL MAXILLOFAC IMPLANTS, 2013 MAR-APR;28(2):543-9

WACHTEL H, FICKL S, HINZE M, BOLZ W, THALMAIR T
THE BONE LAMINA TECHNIQUE: A NOVEL APPROACH FOR LATERAL RIDGE AUGMENTATION - A CASE SERIES
INT J PERIODONTICS RESTORATIVE DENT, 2013 JUL-AUG;33(4):491-7

RODRIGUEZ JG, ELDIBANY RM
VERTICAL SPLITTING OF THE MANDIBULAR BODY AS AN ALTERNATIVE TO INFERIOR ALVEOLAR NERVE LATERALIZATION
INT J ORAL MAXILLOFAC SURG, 2013 SEP;42(9):1060-6

FIGUEIREDO A, COIMBRA P, CABRITA A, GUERRA F, FIGUEIREDO M
COMPARISON OF A XENOGENEIC AND AN ALLOPLASTIC MATERIAL USED IN DENTAL IMPLANTS IN TERMS OF PHYSICO-CHEMICAL CHARACTERISTICS AND IN VIVO INFLAMMATORY RESPONSE
MATER SCI ENG C, MATER BIOL APP, 2013 AUG 1;33(6):3506-13

FELICE P, PISTILLI R, PIATTELLI M, SOARDI E, CORVINO V, ESPOSITO M
POSTERIOR ATROPHIC JAWS REHABILITATED WITH PROSTHESES SUPPORTED BY 5 X 5 MM IMPLANTS WITH A NOVEL NANOSTRUCTURED CALCIUM-INCORPORATED TITANIUM SURFACE OR BY LONGER IMPLANTS IN AUGMENTED BONE. PRELIMINARY RESULTS FROM A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, SUMMER;5(2):149-61

TRAINI T, PIATTELLI A, CAPUTI S, DEGIDI M, MANGANO C, SCARANO A, PERROTTI V, IEZZI G
REGENERATION OF HUMAN BONE USING DIFFERENT BONE SUBSTITUTE BIOMATERIALS
CLIN IMPLANT DENT RELAT RES, 2015 FEB;17(1):150-62

KOLMAS J, SZWAJA M, KOLODZIEJSKI W
SOLID-STATE NMR AND IR CHARACTERIZATION OF COMMERCIAL XENOGENEIC BIOMATERIALS USED AS BONE SUBSTITUTES
J PHARM BIOMED ANAL, 2012 MAR 5;61:136-41

PISTILLI R, FELICE P, PIATTELLI M, GESSAROLI M, SOARDI E, BARAUSSE C, BUTI J, CORVINO V, ESPOSITO M
POSTERIOR ATROPHIC JAWS REHABILITATED WITH PROSTHESES SUPPORTED BY 5 X 5 MM IMPLANTS WITH A NOVEL NANOSTRUCTURED CALCIUM-INCORPORATED TITANIUM SURFACE OR BY LONGER IMPLANTS IN AUGMENTED BONE. ONE-YEAR RESULTS FROM A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2013 WINTER;6(4):343-357

FICKL S, NANNMARK U, SCHLAGENHAUF U, HÜRZELER M, KEBSCHULL M
PORCINE DERMAL MATRIX IN THE TREATMENT OF DEHISCENCE-TYPE DEFECTS - AN EXPERIMENTAL SPLIT-MOUTH ANIMAL TRIAL
CLIN ORAL IMPLANTS RES, 2015 JUL;26(7):799-805

BARONE A, BORGIA V, COVANI U, RICCI M, PIATTELLI A, IEZZI G
FLAP VERSUS FLAPLESS PROCEDURE FOR RIDGE PRESERVATION IN ALVEOLAR EXTRACTION SOCKETS: A HISTOLOGICAL EVALUATION IN A RANDOMIZED CLINICAL TRIAL
CLIN ORAL IMPLANTS RES, 2015 JUL;26(7):806-13

BARONE A, RICCI M, ROMANOS GE, TONELLI P, ALFONSI F, COVANI U
BUCCAL BONE DEFICIENCY IN FRESH EXTRACTION SOCKETS: A PROSPECTIVE SINGLE COHORT STUDY
CLIN ORAL IMPLANTS RES, 2015 JUL;26(7):823-30

BARONE A, TOTI P, QUARANTA A, DERCHI G, COVANI U
THE CLINICAL OUTCOMES OF IMMEDIATE VERSUS DELAYED RESTORATION PROCEDURES ON IMMEDIATE IMPLANTS: A COMPARATIVE COHORT STUDY FOR SINGLE-TOOTH REPLACEMENT
CLIN IMPLANT DENT RELAT RES, 2015 DEC;17(6):1114-26

CASSETTA M, PERROTTI V, CALASSO S, PIATTELLI A, SINJARI B, IEZZI G
BONE FORMATION IN SINUS AUGMENTATION PROCEDURES USING AUTOLOGOUS BONE, PORCINE BONE, AND A 50 : 50 MIXTURE: A HUMAN CLINICAL AND HISTOLOGICAL EVALUATION AT 2 MONTHS
CLIN ORAL IMPLANTS RES, 2015 OCT;26(10):1180-4

GHENO E, PALERMO A, BUFFOLI B, RODELLA LF
THE EFFECTIVENESS OF THE USE OF XENOGENEIC BONE BLOCKS MIXED WITH AUTOLOGOUS CONCENTRATED GROWTH FACTORS (CGF) IN BONE REGENERATION TECHNIQUES
J OSSEOINTEGRATION 2014;6(2):37-42

FALISI G, GALLI M, VITTORINI-VELASQUEZ P, GALLEGOS-RIVERA JC, MINASI R, DE BIASE A, DI PAOLO C
USE OF 3D CARTILAGE SCAFFOLDS FOR THE STABILIZATION OF IMPLANTS AND BONE REGENERATION WITH THE FIT-LOCK TECHNIQUE
ACTA ODONTOL LATINOAM 2013;26(3):167-172

FISCHER KR, FICKL S, MARDAS N, BOZEC L, DONOS N
STAGE-TWO SURGERY USING COLLAGEN SOFT TISSUE GRAFTS: CLINICAL CASES AND ULTRASTRUCTURAL ANALYSIS
QUINTESSENCE INT, 2014 NOV-DEC; 45(10):853-60

FISCHER KR, STAVROPOULOS A, CALVO GUIRADO JL, SCHNEIDER D, FICKL S
INFLUENCE OF LOCAL ADMINISTRATION OF PAMIDRONATE ON EXTRACTION SOCKET HEALING - A HISTOMORPHOMETRIC PROOF-OF-PRINCIPLE PRE-CLINICAL IN VIVO EVALUATION
CLIN ORAL IMPLANTS RES, 2015 OCT;26(10):1135-42

SCARANO A, MURMURA G, SINJIARI B, ASSENZA B, SOLLAZZO V, SPINELLI G, CARINCI F
EXPANSION OF THE ALVEOLAR BONE CREST WITH ULTRASONIC SURGERY DEVICE: CLINICAL STUDY IN MANDIBLE
INT J IMMUNOPATHOL PHARMACOL, 2011 APR-JUN; 24(2 SUPPL):71-5

SCARANO A, PIATTELLI A, MURMURA G, IEZZI G, ASSENZA B, MANCINO C
DELAYED EXPANSION OF THE ATROPHIC MANDIBLE BY ULTRASONIC SURGERY: A CLINICAL AND HISTOLOGIC CASE SERIES
INT J ORAL MAXILLOFAC IMPLANTS, 2015 JAN-FEB:30(1):144-9

LORENZON G, BUTTARELLO GM, CHESSA G
CASE REPORT: IMPLANT PLACEMENT AND IMMEDIATE LOADING WITH SIMULTANEOUS BONE REGENERATION FOLLOWING JAW ODONTOGENIC CYST ENUCLEATION
DENTISTRY, 2015, 5:2

THALMAIR T, FICKL S, SCHNEIDER D, HINZE M, WACHTEL H
DIMENSIONAL ALTERATIONS OF EXTRACTION SITES AFTER DIFFERENT ALVEOLAR RIDGE PRESERVATION TECHNIQUES – A VOLUMETRIC STUDY
J CLIN PERIODONTOL, 2013 JUL;40(7):721-7

MANESCU A, GIULIANI A, MOHAMMADI S, TROMBA G, MAZZONI S, DIOMEDE F, ZINI N, PIATTELLI A, TRUBIANI O
OSTEOGENIC POTENTIAL OF DUAL-BLOCKS CULTURED WITH HUMAN PERIODONTAL LIGAMENT STEM CELLS: IN VITRO AND SYNCHROTRON
J PERIODONTAL RES, 2016 FEB;51(1):112-24

SCARANO A, PIATTELLI A, IEZZI G, VARVARA G
SPONTANEOUS BONE FORMATION ON THE MAXILLARY SINUS FLOOR IN ASSOCIATION WITH SURGERY TO REMOVE A MIGRATED DENTAL IMPLANT: A CASE REPORT
MINERVA STOMATOL, 2014 OCT;63(10):351-9

BARONE A, TOTI P, QUARANTA A, ALFONSI F, CUCCHI A, CALVO GUIRADO JL, NEGRI B, DI FELICE R, COVANI U
VOLUMETRIC ANALYSIS OF REMODELLING PATTERN AFTER RIDGE PRESERVATION COMPARING USE OF TWO TYPES OF XENOGRAFTS. A MULTICENTRE RANDOMIZED CLINICAL TRIAL
CLIN ORAL IMPLANTS RES, 2016 NOV;27(11):E105-E115

ESPOSITO M, GRUSOVIN MG, LAMBERT F, MATOS S, PIETRUSKA M, ROSSI R, SALHI L, BUTI J
THE EFFECTIVENESS OF A RESORBABLE BONE SUBSTITUTE WITH A RESORBABLE MEMBRANE IN THE TREATMENT OF PERIODONTAL INFRABONY DEFECT - A MULTICENTER RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2015;8(3):233-244

OZEL B, FINDIKCIOGLU K, SEZGIN B, GUNEY K, BARUT I, OZMEN S
A NEW OPTION FOR THE RECONSTRUCTION OF ORBITAL FLOOR DEFECTS WITH HETEROLOGOUS CORTICAL BONE
J CRANIOMAXILLOFAC SURG, 2015 OCT;43(8):1583-8

CORBELLA S, TASCHIERI S, WEINSTEIN R, DEL FABBRO M
HISTOMORPHOMETRIC OUTCOMES AFTER LATERAL SINUS FLOOR ELEVATION PROCEDURE: A SYSTEMATIC REVIEW OF THE LITERATURE AND META-ANALYSIS
CLIN ORAL IMPLANTS RES, 2016 SEP;27(9):1106-22

BARONE A, MARCONCINI S, GIAMMARINARO E, MIJIRITSKY E, GELPI F, COVANI U
CLINICAL OUTCOMES OF IMPLANTS PLACED IN EXTRACTION SOCKETS AND IMMEDIATELY RESTORED: A 7-YEAR SINGLE-COHORT PROSPECTIVE STUDY
CLIN IMPLANT DENT RELAT RES, 2016 DEC;18(6):1103-1112.

CAKIR M, KARACA IR, AYŞEGÜL F, KAYMAZ F, BOZKAYA S
EXPERIMENTAL EVALUATION OF THE EFFECTS OF ANKAFERD BLOOD STOPPER AND COLLAGENATED HETEROLOGOUS BONE GRAFT ON BONE HEALING IN SINUS FLOOR AUGMENTATION
CLIN ORAL IMPLANTS RES, 2015 MAR-APR;30(2):279-85

LOPEZ MA, ANDREASI BASSI M, CONFALONE L, CARINCI F
REGENERATION OF ATROPHIC CRESTAL RIDGES WITH RESORBABLE LAMINA: TECHNICAL NOTE
J BIOL REGUL HOMEOST AGENTS 2015 JUL-SEP;29(3 SUPPL 1):97-100

ETTORRE V, DE MARCO P, ZARA S, PERROTTI V, SCARANO A, DI CRESCENZO A, PETRINI M, HADAD C, BOSCO D, ZAVAN B, VALBONETTI L, SPOTO G, IEZZI G, PIATTELLI A, CATALDI A, FONTANA A
IN VITRO AND IN VIVO CHARACTERIZATION OF GRAPHENE OXIDE COATED PORCINE BONE GRANULES
CARBON, JULY 2016, VOLUME 103, PAGES 291–298

ROSSI R, RANCITELLI D, POLI PP, RASIA DAL POLO M, NANNMARK U, MAIORANA C
THE USE OF A COLLAGENATED PORCINE CORTICAL LAMINA IN THE RECONSTRUCTION OF ALVEOLAR RIDGE DEFECTS. A CLINICAL AND HISTOLOGICAL STUDY
MINERVA STOMATOL, 2016 OCT;65(5):257-68

SCARANO A, LORUSSO F, RAVERA L, MORTELLARO C, PIATTELLI A
BONE REGENERATION IN ILIAC CRESTAL DEFECTS: AN EXPERIMENTAL STUDY ON SHEEP
BIOMED RES INT, 2016;2016:4086870

FELICE P, ZUCCHELLI G, CANNIZZARO G, BARAUSSE C, DIAZZI M, TRULLENQUE-ERIKSSON A, ESPOSITO M
IMMEDIATE, IMMEDIATE-DELAYED (6 WEEKS) AND DELAYED (4 MONTHS) POST-EXTRACTIVE SINGLE IMPLANTS: 4-MONTH POST-LOADING DATA FROM A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2016;9(3):233-247

100|ROMBOUTS C, JEANNEAU C, CAMILLERI J, LAURENT P, ABOUT I
CHARACTERIZATION AND ANGIOGENIC POTENTIAL OF XENOGENEIC BONE GRAFTING MATERIALS: ROLE OF PERIODONTAL LIGAMENT CELLS
DENT MATER J, 2016 DEC 1;35(6):900-907

BARONE A, TOTI P, MARCONCINI S, DERCHI G, MARCHIONNI S, COVANI U
ESTHETIC OUTCOME OF IMPLANTS PLACED IN FRESH EXTRACTION SOCKETS BY CLINICIANS WITH OR WITHOUT EXPERIENCE: A MEDIUM-TERM RETROSPECTIVE EVALUATION
INT J ORAL MAXILLOFAC IMPLANTS, 2016;31(6)

TALLARICO M, XHANARI E, PISANO M, DE RIU G, TULLIO A, MELONI SM
SINGLE POST-EXTRACTIVE ULTRA-WIDE 7 MM-DIAMETER IMPLANTS VERSUS IMPLANTS PLACED IN MOLAR HEALED SITES AFTER SOCKET PRESERVATION FOR MOLAR REPLACEMENT: 6-MONTH POST-LOADING RESULTS FROM A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2016;9(3):263-275

LOPEZ MA, MANZULLI N, CASALE M, ORMIANER Z, CARINCI F
THE USE OF RESORBABLE HETEROLOGOUS CORTICAL LAMINA AS A NEW SINUS LIFT FLOOR: A TECHNICAL NOTE
J BIOL REGUL HOMEOST AGENTS, 2016 APR-JUN;30(2 SUPPL 1):75-79

LOPEZ MA, ANDREASI BASSI M, CONFALONE L, CARINCI F, ORMIANER Z, LAURITANO D
THE USE OF RESORBABLE CORTICAL LAMINA AND MICRONIZED COLLAGENATED BONE IN THE REGENERATION OF ATROPHIC CRESTAL RIDGES: A SURGICAL TECHNIQUE. CASE SERIES
J BIOL REGUL HOMEOST AGENTS, 2016 APR-JUN;30(2 SUPPL 1):81-85

ESPOSITO M, ZUCCHELLI G, BARAUSSE C, PISTILLI R, TRULLENQUE-ERIKSSON A, FELICE P
FOUR MM-LONG VERSUS LONGER IMPLANTS IN AUGMENTED BONE IN POSTERIOR ATROPHIC JAWS: 4-MONTH POST-LOADING RESULTS FROM A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2016;9(4):393–409

BARONE A, TOTI P, QUARANTA A, ALFONSI F, CUCCHI A, NEGRI B, DI FELICE R, MARCHIONNI S, CALVO GUIRADO JL, COVANI U, NANNMARK U
CLINICAL AND HISTOLOGICAL CHANGES AFTER RIDGE PRESERVATION WITH TWO XENOGRAFTS: PRELIMINARY RESULTS FROM A MULTICENTER RANDOMIZED CONTROLLED CLINICAL TRIAL
J CLIN PERIODONTOL, 2017 FEB;44(2):204-214

BARONE A, ALFONSI F, BORGIA V, IEZZI G, PIATTELLI A, COVANI U, TONELLI P
MOLECULAR, CELLULAR AND PHARMACEUTICAL ASPECTS OF FILLING BIOMATERIALS DURING THE MANAGEMENT OF EXTRACTION SOCKETS
CURR PHARM BIOTECHNOL, 2017;18(1):64-75

BARONE A, TOTI P, MENCHINI FABRIS GB, MARCHIONNI S, COVANI U
EARLY VOLUMETRIC CHANGES AFTER VERTICAL AUGMENTATION OF THE ATROPHIC POSTERIOR MANDIBLE WITH INTERPOSITIONAL BLOCK GRAFT VERSUS ONLAY BONE GRAFT: A RETROSPECTIVE RADIOLOGICAL STUDY
J CRANIO-MAXILLOFAC, 2017 SEP;45(9):1438-1447

BARONE A, TOTI P, FUNEL N, CAMPANI D, COVANI U
EXPRESSION OF SP7, RUNX1, DLX5, AND CTNNB1 IN HUMAN MESENCHYMAL STEM CELLS CULTURED ON XENOGENEIC BONE SUBSTITUTE AS COMPARED WITH MACHINED TITANIUM
IMPLANT DENT, 2014 AUG;23(4):407-15

ESPOSITO M, ZUCCHELLI G, CANNIZZARO G, CHECCHI L, BARAUSSE C, TRULLENQUE-ERIKSSON, FELICE P
IMMEDIATE, IMMEDIATE-DELAYED (6 WEEKS) AND DELAYED (4 MONTHS) POST-EXTRACTIVE SINGLE IMPLANTS: 1-YEAR POST-LOADING DATA FROM A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2017;10(1):11-26

SCARANO A, CRINCOLI V, DI BENEDETTO A, COZZOLINO V, LORUSSO F, PODALIRI VULPIANI M, GRANO M, KALEMAJ Z, MORI G, GRASSI FR
BONE REGENERATION INDUCED BY BONE PORCINE BLOCK WITH BONE MARROW STROMAL STEM CELLS IN A MINIPIG MODEL OF MANDIBULAR "CRITICAL SIZE" DEFECT
STEM CELLS INT, 2017;2017:9082869

SCARANO A
TRADITIONAL POSTEXTRACTIVE IMPLANT SITE PREPARATION COMPARED WITH PRE-EXTRACTIVE INTERRADICULAR IMPLANT BED PREPARATION IN THE MANDIBULAR MOLAR REGION, USING AN ULTRASONIC DEVICE: A RANDOMAZED PILOT STUDY
INT J ORAL MAXILLOFAC IMPLANTS, 2017 MAY/JUN;32(3):655-660

BARONE A, TOTI P, MENCHINI-FABRIS GB, DERCHI G, MARCONCINI S, COVANI U
EXTRA ORAL DIGITAL SCANNING AND IMAGING SUPERIMPOSITION FOR VOLUME ANALYSIS OF BONE REMODELING AFTER TOOTH EXTRACTION WITH AND WITHOUT 2 TYPES OF PARTICULATE PORCINE MINERAL INSERTION: A RANDOMIZED CONTROLLED TRIAL
CLIN IMPLANT DENT RELAT RES, 2017 AUG;19(4):750-759

GIULIANI A, IEZZI G, MAZZONI S, PIATTELLI A, PERROTTI V, BARONE A
REGENERATIVE PROPERTIES OF COLLAGENATED PORCINE BONE GRAFTS IN HUMAN MAXILLA: DEMONSTRATIVE STUDY OF THE KINETICS BY SYNCHROTRON RADIATION MICROTOMOGRAPHY AND LIGHT MICROSCOPY
CLINICAL ORAL INVESTIGATIONS, 2018 JAN;22(1):505-513

IEZZI G, PIATTELLI A, GIULIANI A, MANGANO C, BARONE A, MANZON L, DEGIDI M, SCARANO A, FILIPPONE A, PERROTTI V
MOLECULAR, CELLULAR AND PHARMACEUTICAL ASPECTS OF FILLING BIOMATERIALS DURING MAXILLARY SINUS-LIFT PROCEDCURES. PART 2: DETAILED CHARACTERISTICS OF THE MATERIALS
CURR PHARM BIOTECHNOL, 2017, 18, 33-44

FELICE P, BARAUSSE C, BARONE A, ZUCCHELLI G, PIATTELLI M, PISTILLI R, IPPOLITO DR, SIMION M
INTERPOSITIONAL AUGMENTATION TECHNIQUE IN THE TREATMENT OF POSTERIOR MANDIBULAR ATROPHIES: A RETROSPECTIVE STUDY COMPARING 129 AUTOGENOUS AND HETEROLOGOUS BONE BLOCKS WITH 2 TO 7 YEARS FOLLOW-UP
INT J PERIODONTICS RESTORATIVE DENT, 2017 JUL/AUG;37(4):469-480

IIDA T, CARNEIRO MARTINS NETO E, BOTTICELLI D, APAZA ALCCAYHUAMAN KA, LANG NP, XAVIER SP
INFLUENCE OF A COLLAGEN MEMBRANE POSITIONED SUBJACENT THE SINUS MUCOSA FOLLOWING THE ELEVATION OF THE MAXILLARY SINUS. A HISTOMORPHOMETRIC STUDY IN RABBITS
CLIN IMPLANT DENT RELAT RES, 2017 JUN 7, EPUB AHEAD OF PRINT

DE MARCO P, ZARA S, DE COLLI M, RADUNOVIC M, LAZOVIC V, ETTORRE V, DI CRESCENZO A, PIATTELLI A, CATALDI A, FONTANA A
GRAPHENE OXIDE IMPROVES THE BIOCOMPATIBILITY OF COLLAGEN MEMBRANES IN AN IN VITRO MODEL OF HUMAN PRIMARY GINGIVAL FIBROBLASTS
BIOMED MATER, 2017 SEP 13;12(5):055005

MIJIRITSKY E, FERRONI L, GARDIN C, BRESSAN E, ZANETTE G, PIATTELLI A, ZAVAN B
PORCINE BONE SCAFFOLDS ADSORB GROWTH FACTORS SECRETED BY MSCS AND IMPROVE BONE TISSUE REPAIR
MATERIALS, 2017 SEP 8;10(9)

ROSSI R, FOCE E, SCOLAVINO S
THE CORTICAL LAMINA TECHNIQUE: A NEW OPTION FOR ALVEOLAR RIDGE AUGMENTATION. PROCEDURE, PROTOCOL, AND CASE REPORT
J LEBANESE DENTAL ASS, 2017 JAN-JUN; 52(1):35-41

CHECCHI V, FELICE P, ZUCCHELLI G, BARAUSSE C, PIATTELLI M, PISTILLI R, GRANDI G, ESPOSITO M
WIDE DIAMETER IMMEDIATE POST-EXTRACTIVE IMPLANTS VS DELAYED PLACEMENT OF NORMAL-DIAMETER IMPLANTS IN PRESERVED SOCKETS IN THE MOLAR REGION: 1-YEAR POST-LOADING OUTCOME OF A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2017;10(3):263-278

CRESPI R, CAPPARÈ P, GHERLONE E
COMPARISON OF MAGNESIUM-ENRICHED HYDROXYAPATITE AND PORCINE BONE IN HUMAN EXTRACTION SOCKET HEALING: A HISTOLOGIC AND HISTOMORPHOMETRIC EVALUATION
INT J ORAL MAXILLOFAC IMPLANTS, 2011 SEP-OCT;26(5):1057-62

CORBELLA S, TASCHIERI S, FRANCETTI L, WEINSTEIN R, DEL FABBRO M
HISTOMORPHOMETRIC RESULTS AFTER POSTEXTRACTION SOCKET HEALING WITH DIFFERENT BIOMATERIALS: A SYSTEMATIC REVIEW OF THE LITERATURE AND META-ANALYSIS
INT J ORAL MAXILLOFAC IMPLANTS, 2017 SEP/OCT;32(5):1001–1017

RADUNOVIC M, DE COLLI M, DE MARCO P, DI NISIO C, FONTANA A, PIATTELLI A, CATALDI A, ZARA S
GRAPHENE OXIDE ENRICHMENT OF COLLAGEN MEMBRANES IMPROVES DPSCS DIFFERENTIATION AND CONTROLS INFLAMMATION OCCURRENCE
J BIOMED MATER RES A, 2017 AUG;105(8):2312-2320

KILINC A, ATAOL M
HOW EFFECTIVE IS COLLAGEN RESORBABLE MEMBRANE PLACEMENT AFTER PARTIALLY IMPACTED MANDIBULAR THIRD MOLAR SURGERY ON POSTOPERATIVE MORBIDITY? A PROSPECTIVE RANDOMIZED COMPARATIVE STUDY
BMC ORAL HEALTH, 2017 OCT 5;17(1):126

TROIANO G, ZHURAKIVSKA K, LO MUZIO L, LAINO L, CICCIÙ M, LO RUSSO L
COMBINATION OF BONE GRAFT AND RESORBABLE MEMBRANE FOR ALVEOLAR RIDGE PRESERVATION: A SYSTEMATIC REVIEW, META-ANALYSIS AND TRIAL SEQUENTIAL ANALYSIS
J PERIODONTOL, 2017 SEP 12:1-17. EPUB AHEAD OF PRINT

ROSSI R, LONGO E, MIJIRITSKY E
A NEW INTERPRETATION OF GUIDED IMPLANT SURGERY TO ACHIEVE AN OPTIMAL RESULT IN THE ESTHETIC ZONES
MEDICAL RESEARCH ARCHIVES, 2017 APRIL, VOL. 5, ISSUE 4

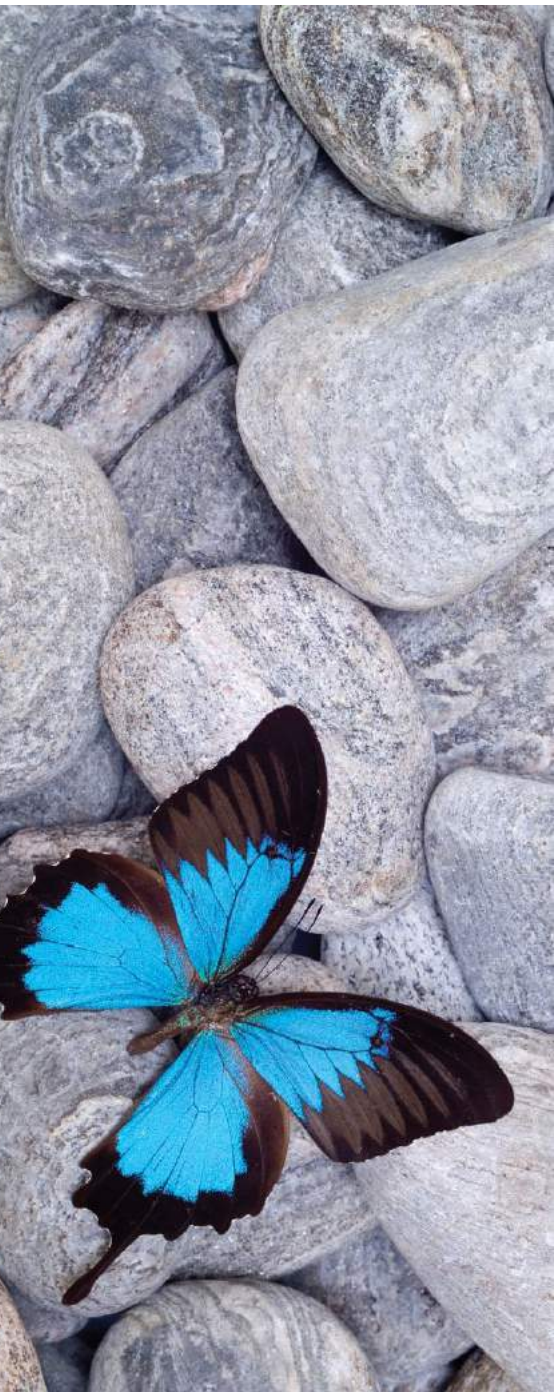
BOLLE C, FELICE P, BARAUSSE C, PISTILLI V, TRULLENQUE-ERIKSSON A, ESPOSITO M
FOUR MM-LONG VERSUS LONGER IMPLANTS IN AUGMENTED BONE IN POSTERIOR ATROPHIC JAWS: 1-YEAR POST-LOADING RESULTS FROM A MULTICENTRE RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2018;11(1):31-47

ESPOSITO M, DAVÒ R, MARTI PAGES C, FERRER FUENTES A, BARAUSSE C, PISTILLI R, IPPOLITO DR, FELICE P
IMMEDIATELY LOADED ZYGOMATIC IMPLANTS VS CONVENTIONAL DENTAL IMPLANTS IN AUGMENTED ATROPHIC MAXILLAE: 4 MONTHS POST-LOADING RESULTS FROM A MULTICENTRE RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2018;11(1):11-28

GASTALDI G, FELICE P, PSTILLI V, BARAUSSE C, IPPOLITO DR, ESPOSITO M
POSTERIOR ATROPHIC JAWS REHABILITATED WITH PROSTHESES SUPPORTED BY 5 × 5 MM IMPLANTS WITH A NANOSTRUCTURED CALCIUM-INCORPORATED TITANIUM SURFACE OR BY LONGER IMPLANTS IN AUGMENTED BONE. 3-YEAR RESULTS FROM A RANDOMISED CONTROLLED TRIAL
EUR J ORAL IMPLANTOL, 2018;11(1):49-61

DIOMEDE F, D'AURORA M, GUGLIANDOLO A, MERCIARO I, ORSINI T, GATTA V, PIATTELLI A, TRUBIANI O, MAZZON E
BIOFUNCTIONALIZED SCAFFOLD IN BONE TISSUE REPAIR
INT J OF MOLECULAR SCIENCES, 2018, 19, 1022

OsteoBiol®
product codes



PRODUCT	PACKAGING	TYPE	SIZE	PORCINE CODE	EQUINE CODE
BONE SUBSTITUTES					
Gen-Os®	1 Vial	DRIED GRANULES	0.25 g	M1052FS	M1052FE
Gen-Os®	1 Vial	DRIED GRANULES	0.5 g	M1005FS	M1005FE
Gen-Os®	1 Vial	DRIED GRANULES	1.0 g	M1010FS	M1010FE
Gen-Os®	1 Vial	DRIED GRANULES	2.0 g	M1020FS	M1020FE
Gen-Os® 1000-2000	1 Vial	DRIED GRANULES	1.0 g	M0210FS	
Gen-Os® 1000-2000	1 Vial	DRIED GRANULES	2.0 g	M0220FS	
TSV Gel	1 Syringe	Thermo GEL	0.5 g	TSV005S in kit with M1005FS or A1005FS	TSV005E in kit with M1005FE or A1005FE
TSV Gel	1 Syringe	GEL	1.0 g	TSV010S in kit with M1010FS or A1010FS	TSV010E in kit with M1010FE or A1010FE
mp3®	1 Syringe	BONE MIX	0.5 cc	A3095FS	A3095FE
mp3®	1 Syringe	BONE MIX	1.0 cc	A3005FS	A3005FE
mp3®	3 Syringes	BONE MIX	3x0.25 cc (0.75 cc)	A3075FS	
mp3®	3 Syringes	BONE MIX	3x0.5 cc (1.5 cc)	A3015FS	A3015FE
mp3®	3 Syringes	BONE MIX	3x1.0 cc (3.0 cc)	A3030FS	A3030FE
mp3®	1 Syringe (wide tip)	BONE MIX	2.0 cc	A3010FS	A3010FE
mp3® 1000-2000	1 Syringe (wide tip)	BONE MIX	2.0 cc	A3210FS	A3210FE
Putty	1 Syringe	BONE PASTE	0.25 cc	HPT52S	
Putty	1 Syringe	BONE PASTE	0.5 cc	HPT09S	HPT09E
Putty	3 Syringes	BONE PASTE	3x0.25 cc (0.75 cc)	HPT32S	HPT32E
Putty	3 Syringes	BONE PASTE	3x0.5 cc (1.5 cc)	HPT35S	HPT35E
Putty	1 Syringe (wide tip)	BONE PASTE	1.0 cc	HPT61S	HPT61E
Gel 40	1 Syringe	BONE GEL	0.5 cc	05GEL40S	05GEL40E
Gel 40	3 Syringes	BONE GEL	3x0.5 cc (1.5 cc)	15GEL40S	15GEL40E
Apatos Mix	1 Vial	DRIED GRANULES	0.5 g	A1005FS	A1005FE
Apatos Mix	1 Vial	DRIED GRANULES	1.0 g	A1010FS	A1010FE
Apatos Mix	1 Vial	DRIED GRANULES	2.0 g	A1020FS	A1020FE
Apatos Cortical	1 Vial	DRIED GRANULES	0.5 g	AC1005FS	
Apatos Cortical	1 Vial	DRIED GRANULES	1.0 g	AC1010FS	
Apatos Mix 1000-2000	1 Vial	DRIED GRANULES	1.0 g	A0210FS	A0210FE

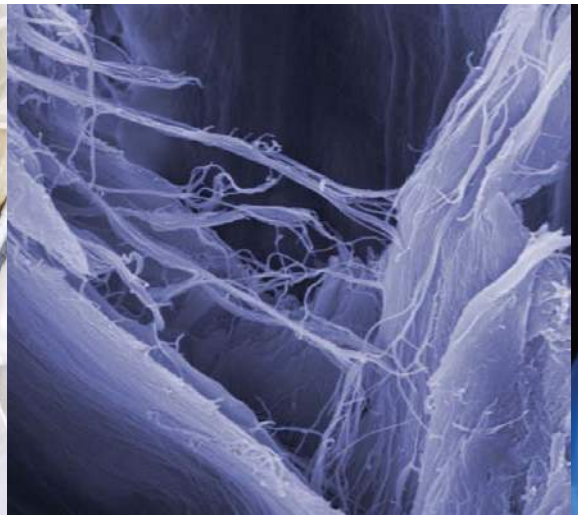
OsteoBiol® product codes

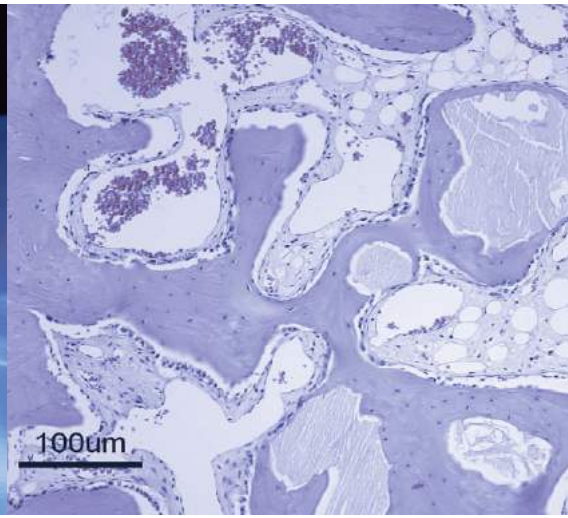
PRODUCT	PACKAGING	TYPE	SIZE	PORCINE CODE	EQUINE CODE
BLOCKS					
Sp-Block	1 Blister	DRIED BLOCK / NORM	10x10x10 mm		BN0E
Sp-Block	1 Blister	DRIED BLOCK / NORM	10x10x20 mm		BN1E
Sp-Block	1 Blister	DRIED BLOCK / NORM	10x20x20 mm		BN2E
Sp-Block	1 Blister	DRIED BLOCK / NORM	35x10x5 mm		BN8E
Dual-Block CURVED	1 Blister	DRIED BLOCK / SOFT	20x15x5 mm	STS7S	
Dual-Block CURVED	1 Blister	DRIED BLOCK / NORM	20x10x5 mm	STN5S	
MEMBRANES AND BARRIERS					
Evolution	1 Blister	DRIED / X-FINE	20x20x (0.2) mm	EM02XS	
Evolution	1 Blister	DRIED / X-FINE	30x30x (0.2) mm	EM03XS	
Evolution	1 Blister	DRIED / FINE	20x20x (0.4) mm		EV02LLE
Evolution	1 Blister	DRIED / FINE	30x30x (0.4) mm		EV03LLE
Evolution	1 Blister	DRIED / FINE	Oval 25x35x (0.4) mm		EVOLLE
Evolution	1 Blister	DRIED / FINE	40x40x (0.5) mm		EV04LLE
Evolution	1 Blister	DRIED / FINE	80x60x (0.4) mm		EV06LLE
Evolution	1 Blister	DRIED / STANDARD	20x20x (0.6) mm	EM02HS	EV02HHE
Evolution	1 Blister	DRIED / STANDARD	30x30x (0.6) mm	EM03HS	EV03HHE
Evolution	1 Blister	DRIED / STANDARD	Oval 25x35x (0.6) mm	EM00HS	
Derma	1 Blister	DRIED / X-FINE	20x20x (0.6) mm	ED02LS	
Derma	1 Blister	DRIED / FINE	Oval 12x8x (0.9) mm	ED21FS	
Derma	1 Blister	DRIED / FINE	25x25x (1.0) mm	ED25FS	
Derma	1 Blister	DRIED / FINE	50x50x (1.0) mm	ED05FS	
Derma	1 Blister	DRIED / STANDARD	15x5x (2.0) mm	ED15SS	
Derma	1 Blister	DRIED / STANDARD	30x30x (2.0) mm	ED03SS	
Derma	1 Blister	DRIED / STANDARD	50x50x (2.0) mm	ED05SS	
Soft Cortical Lamina	1 Blister	DRIED / FINE	25x25x (0.5) mm	LS25FS	LS25FE
Soft Cortical Lamina	1 Blister	DRIED / FINE	Oval 25x35x (0.5) mm	LS23FS	LS23FE
Soft Cortical Lamina	1 Blister	DRIED / MEDIUM	20x40x (1.0) mm	LS24LS	
Curved Lamina	1 Blister	DRIED / MEDIUM	35x35x (0.9) mm	LS10HS	LS10HE
Soft Cortical Lamina	1 Blister	DRIED / SEMI-SOFT	35x35x (1.0) mm	LS35LS	
Soft Cortical Lamina	1 Blister	DRIED / STANDARD	30x30x (2.0) mm	LS03SS	LS03SE
Special	1 Blister	DRIED / X-FINE	20x20x (0.2) mm		EM02LE
Special	1 Blister	DRIED / X-FINE	30x30x (0.2) mm		EM03LE
Duo-Teck	1 Blister	DRIED	20x20x (1.0) mm		DT020
Duo-Teck	6 Blister	DRIED FELT	25x25x (0.2) mm		DTN625

Get it on Google play

OsteoBiol®
by Tecnoss

Available on the App Store



Tecnoss s.r.l. is an innovative, globally active company that develops, produces and documents premium-quality xenogenic biomaterials by the brands Tecnoss® and OsteoBiol®.

Its 20 years of research led to its patent-protected production process that ensures neutralization of antigenic components in order to achieve biocompatibility, while preserving the natural collagen matrix inside the biomaterial.

Tecnoss® products comply with highest quality standards such as ISO 10993, ISO 13485 and 93/42/EEC.

osteobiol.com

DISTRIBUTED BY

Tecnoss® s.r.l.
Via Nurivalle, 8
10094 Giaveno (TO), Italy
Tel./Fax. +39 011 976 6684

info@tecnoss.com
www.tecnoss.com
BIOMATERIALS ENGINEERING

MKT-CAT0518EN

Tecnoss® Dental s.r.l.
Building B2
c/o Environment Park
Via Livorno, 60
10144 Torino, Italy
info@tecnoss-dental.com
www.osteobiol.com
INTERNATIONAL SALES & MARKETING