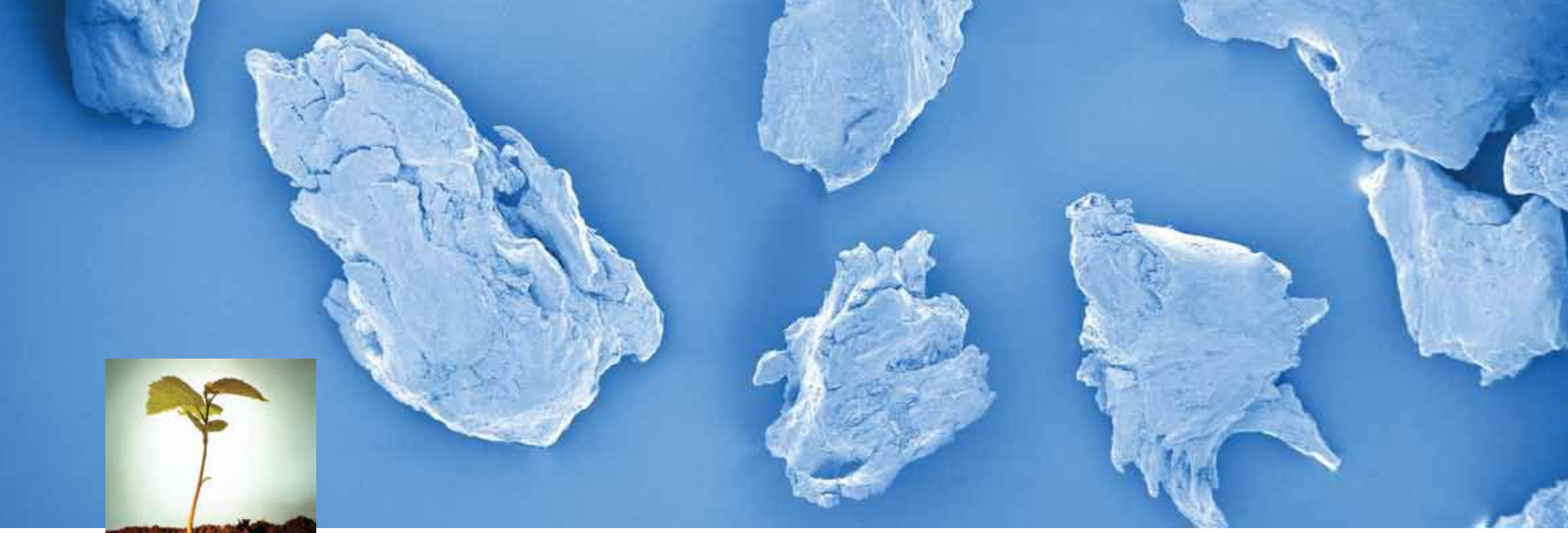
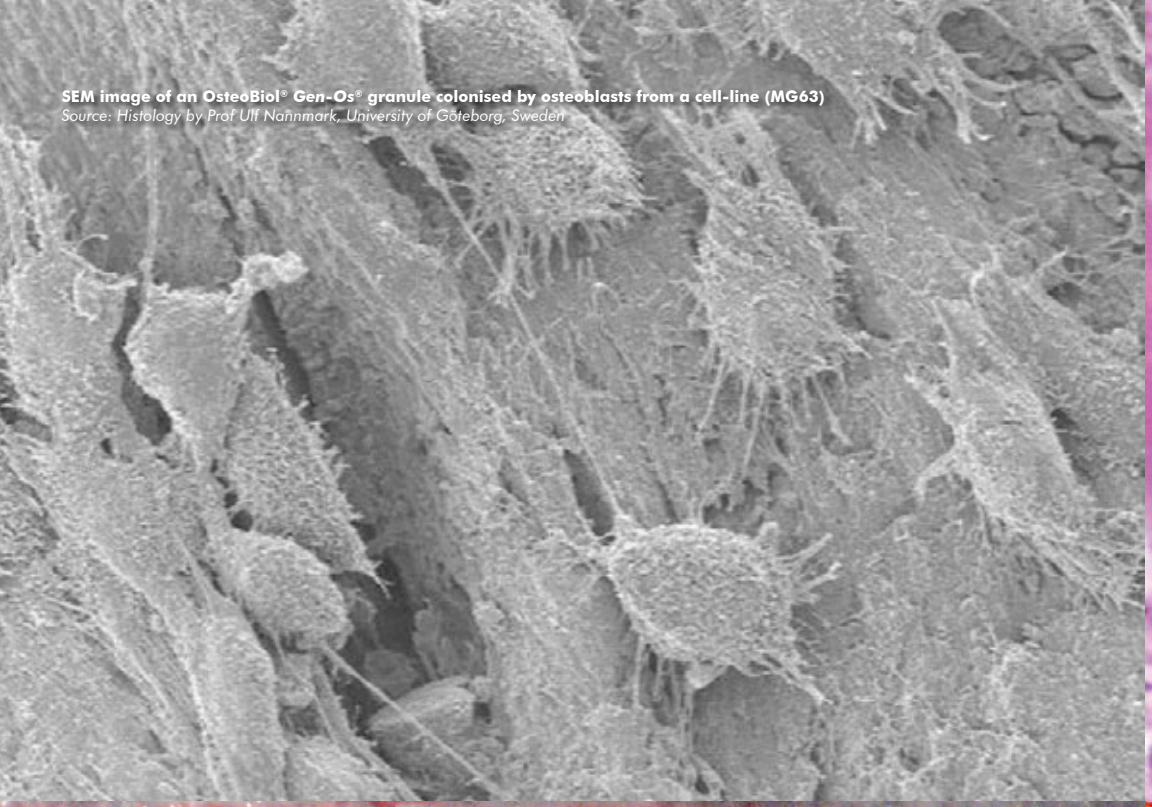


OsteoBiol®
by Tecnoss

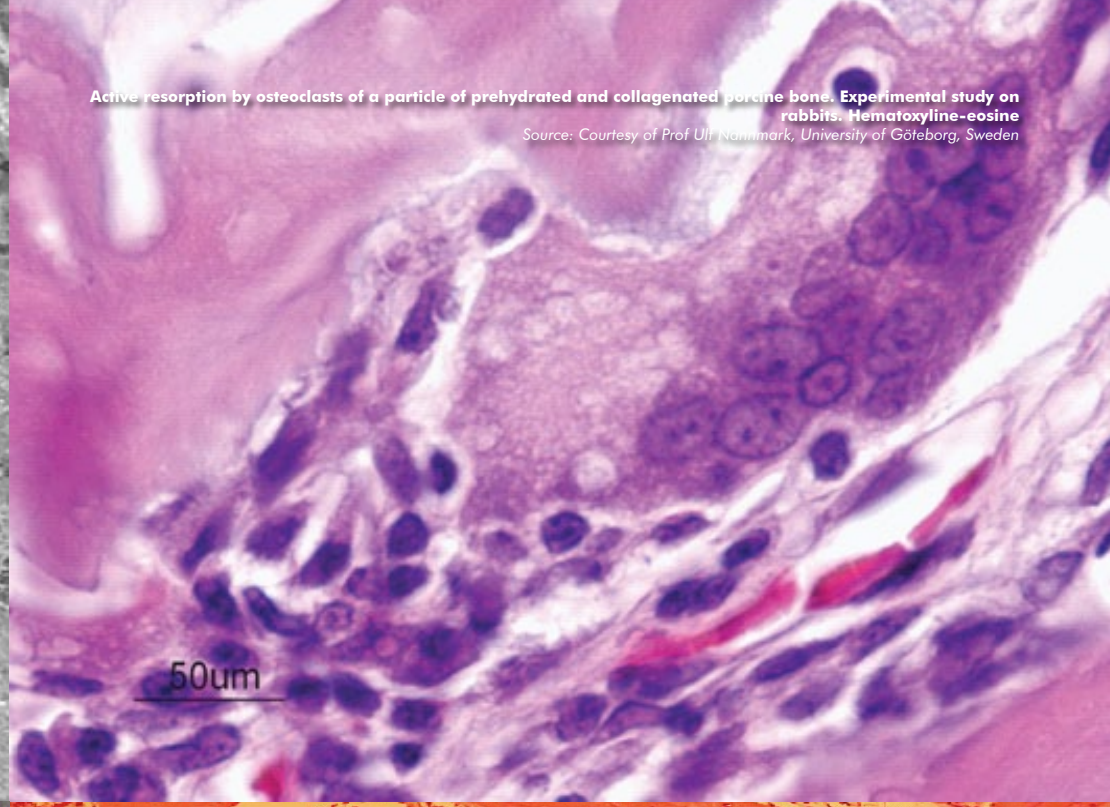
Bone Grafting Materials

REGENERATION SCIENCE

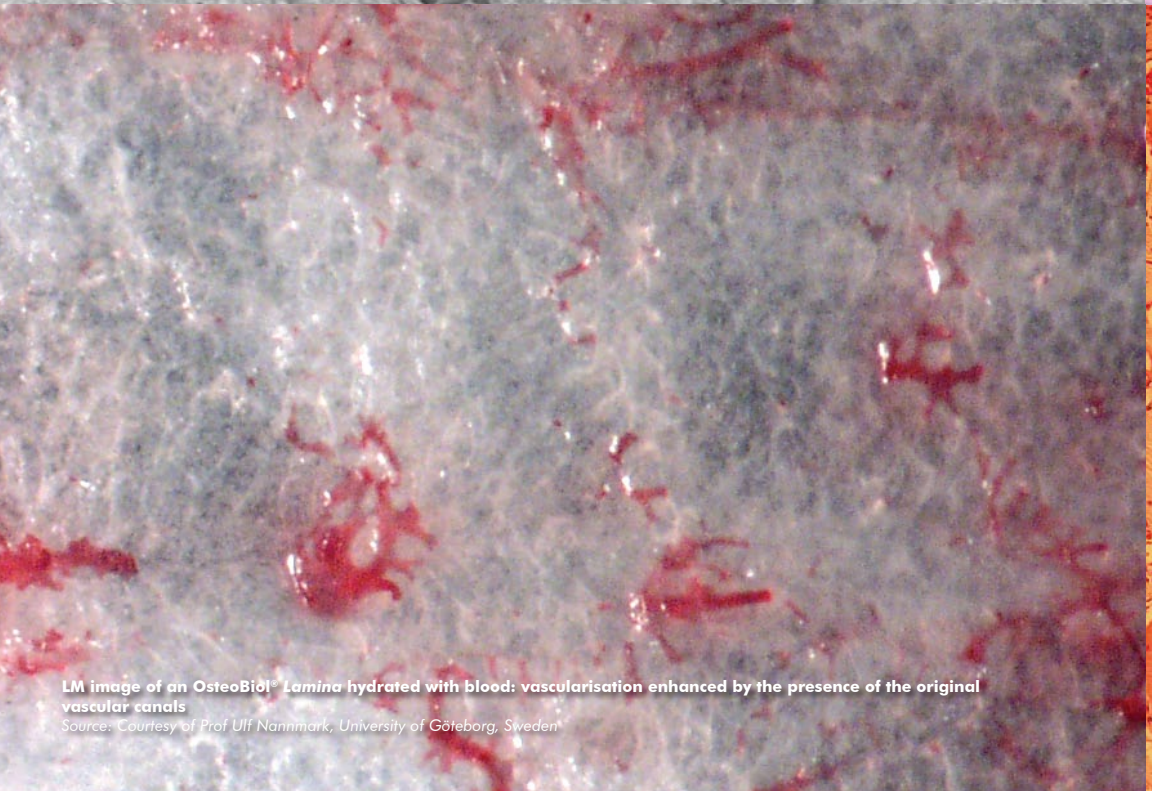
INSPIRED BY NATURE



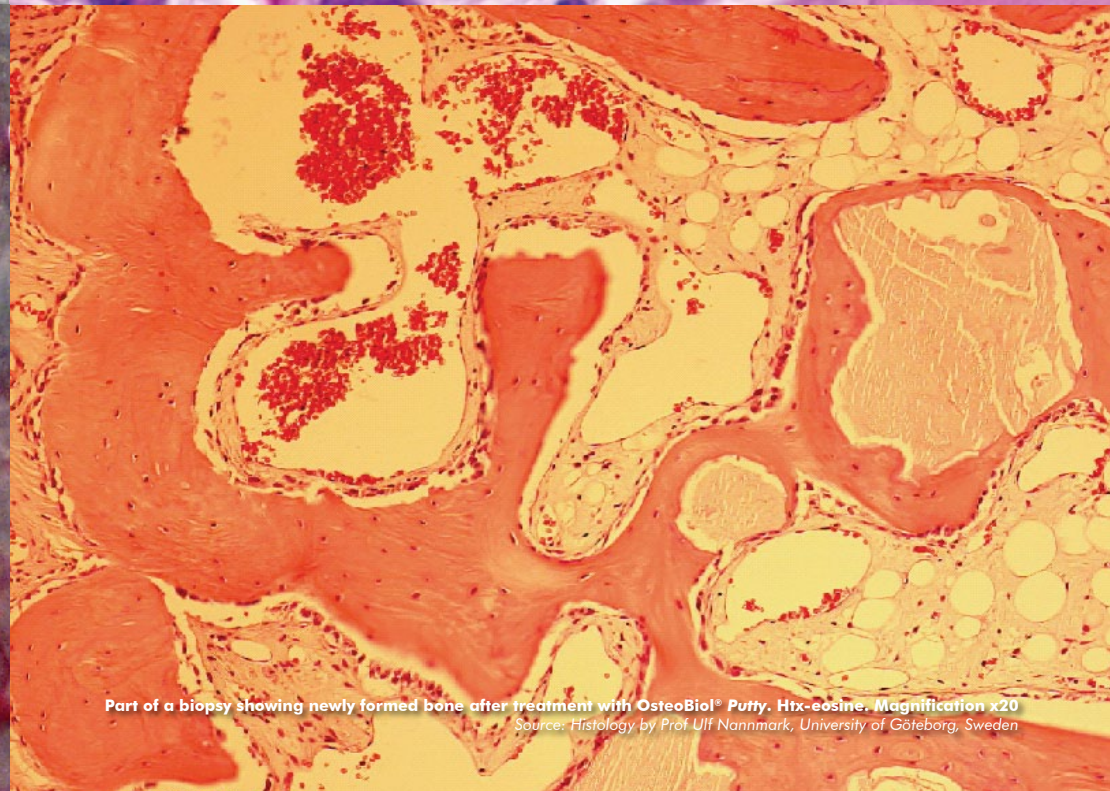
SEM image of an OsteoBiol® *Gen-Os*® granule colonised by osteoblasts from a cell-line (MG63)
Source: Histology by Prof Ulf Nannmark, University of Göteborg, Sweden



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

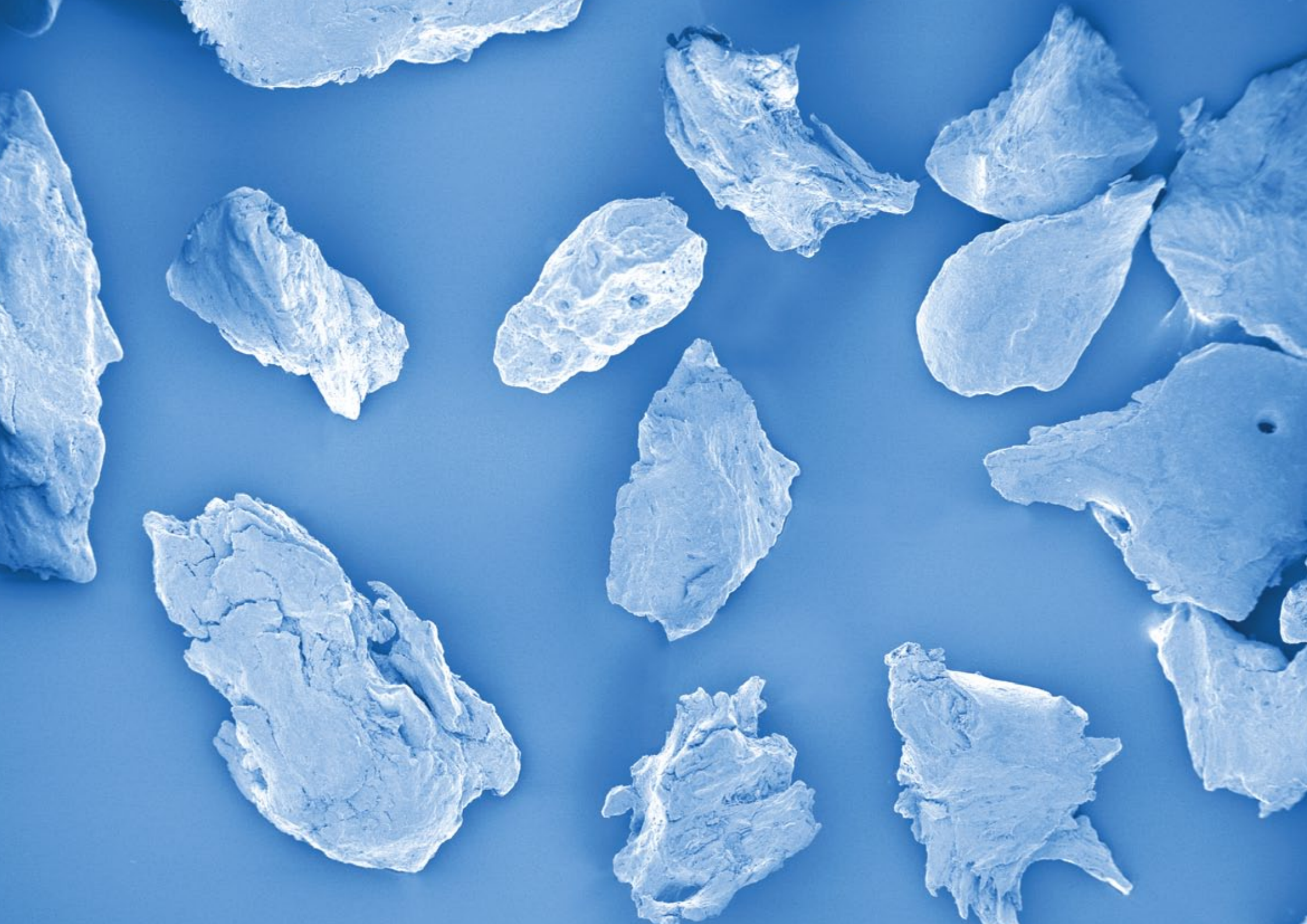


Part of a biopsy showing newly formed bone after treatment with OsteoBiol® *Putty*. Htx-eosine. Magnification x20
Source: Histology by Prof Ulf Nannmark, University of Göteborg, Sweden

OUR MISSION

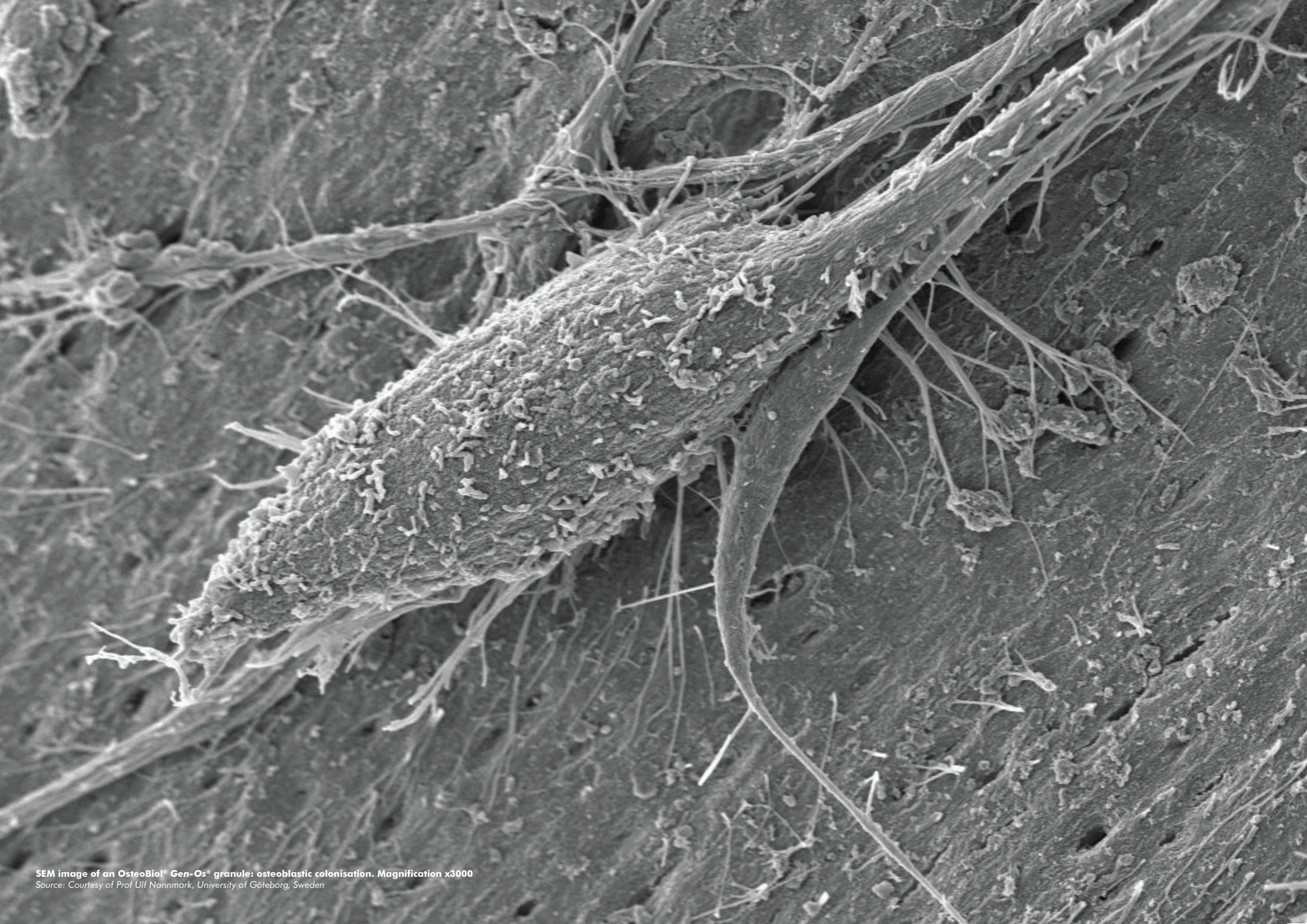
«To produce a xenogenic bone substitute as similar as possible to autogenous bone»

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



THE OSTEOBIOL® DUAL-PHASE HETEROLOGOUS BONE MATRIX

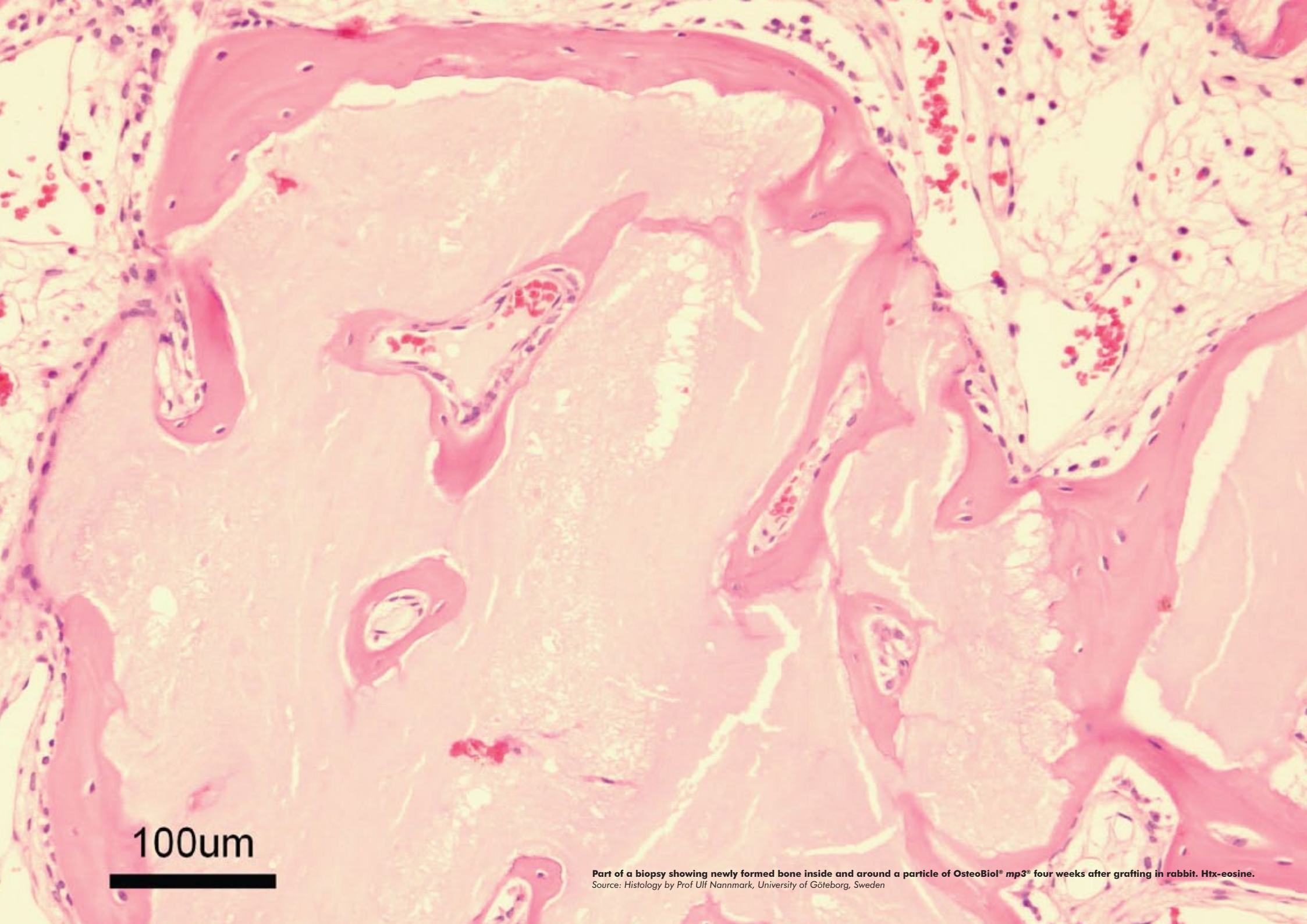
OsteoBiol® is the family of biomaterials produced by Tecnoss® for the dental and maxillo-facial surgeons.
In each OsteoBiol® granule, besides its mineral phase, the Tecnoss® process retains the xenogenic collagen phase with its precious biological properties, making it biocompatible and ideal for grafting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



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.



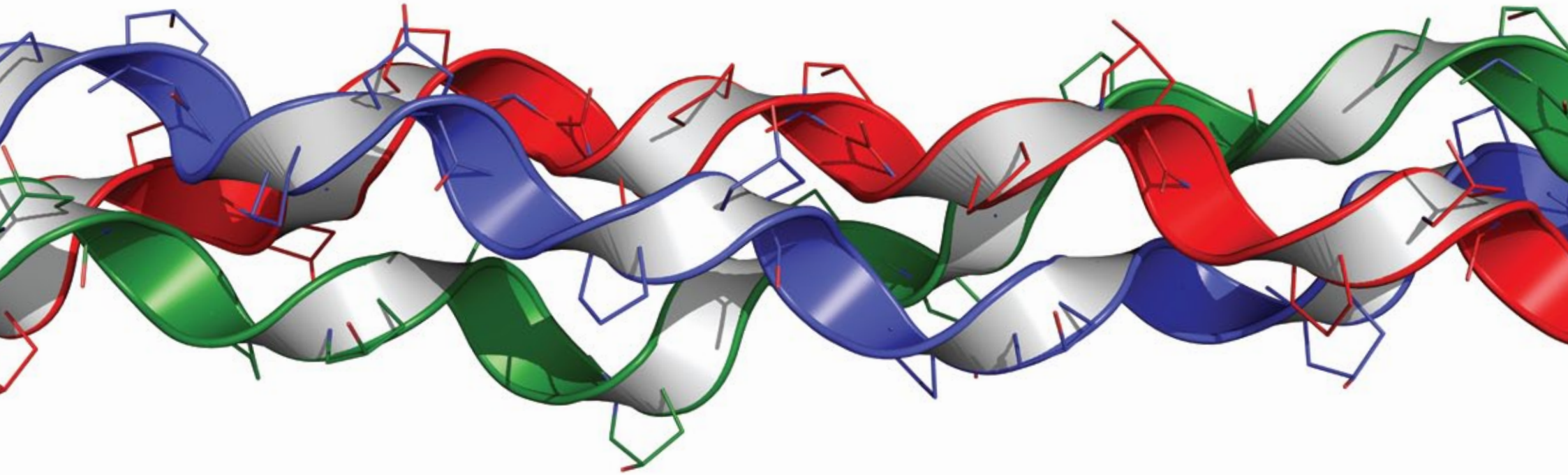
Part of a biopsy showing newly formed bone inside and around a particle of OsteoBiol® *mp3*® four weeks after grafting in rabbit. Htx-eosine.
Source: Histology by Prof Ulf Nannmark, University of Göteborg, Sweden

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, which are partially but significantly replaced by vital bone at re-entry time.

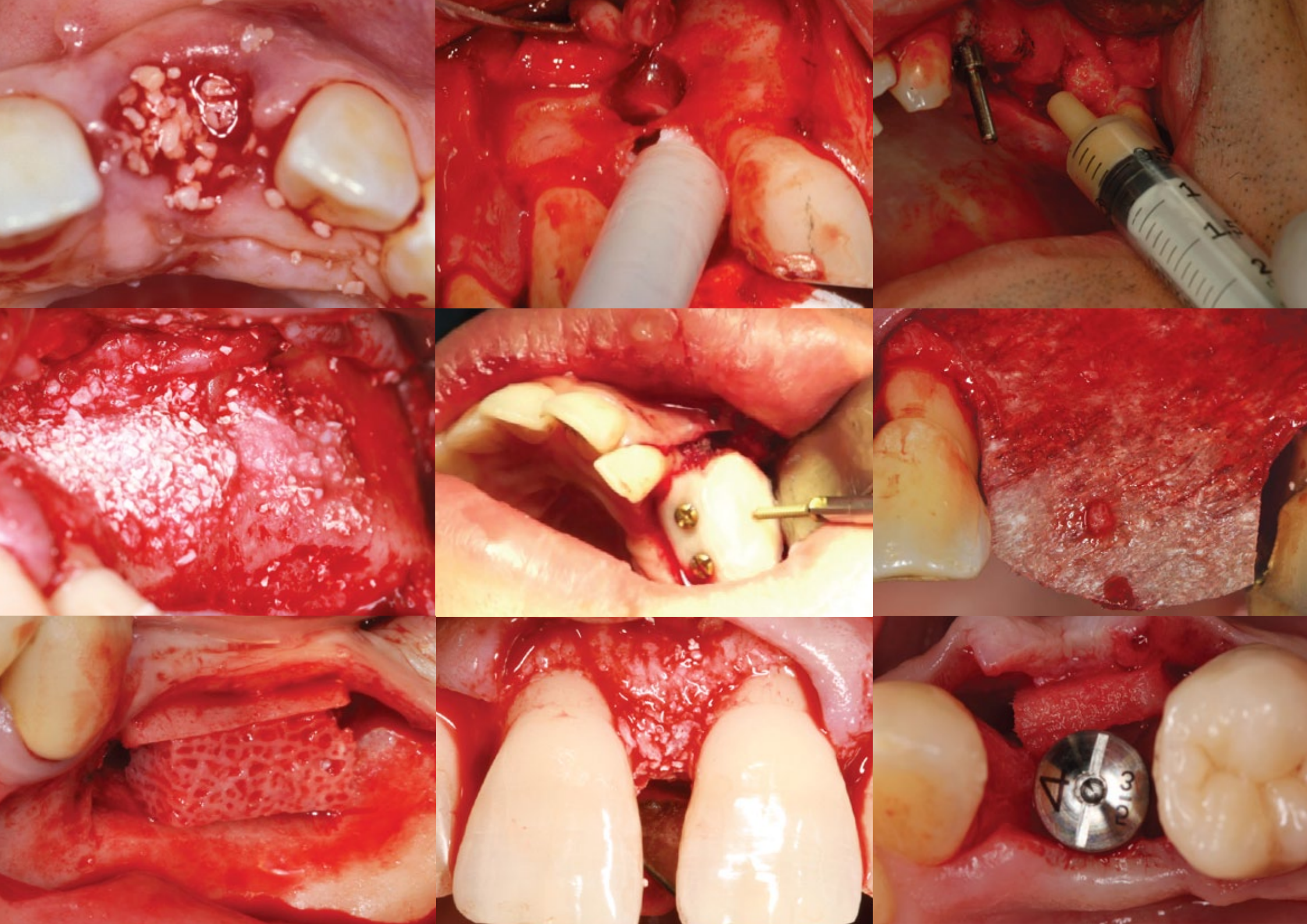
VASCULARIZATION IS THE KEY FOR CLINICAL SUCCESS

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.



THE ROLE OF COLLAGEN

Collagen favours MSC differentiation and enhances osteoblasts proliferation: 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.



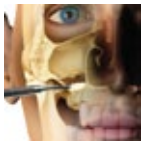
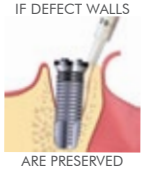
A SPECIFIC PRODUCT FOR EVERY CLINICAL INDICATION

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 10 years of clinical research: you will experience that today it is finally possible to achieve predictable clinical success without the availability limitations of autogenous bone.

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 is the greatest reward for any surgeon and fulfillment of our company mission.

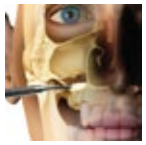
OsteoBiol® products vs clinical indications

	Gen-Os®	mp3®	Putty	Gel 40
	Collagenated heterologous cortico-cancellous bone mix *Granulometry 250-1000 µm* **For information on OsteoBiol® *Gen-Os*® see page 22**	Pre-hydrated collagenated heterologous cortico-cancellous bone mix *Granulometry 600-1000 µm* **For information on OsteoBiol® *mp3*® see page 30**	Pre-hydrated collagenated heterologous cortico-cancellous bone paste *Granulometry up to 300 µm* **For information on OsteoBiol® *Putty* see page 34**	Pre-hydrated collagenated heterologous cortico-cancellous bone gel *Granulometry up to 300 µm* **For information on OsteoBiol® *Gel 40* see page 38**
ALVEOLAR REGENERATION	 			
MAXILLARY SINUS LIFT	 			CRESTAL ACCESS ONLY 
PERI-IMPLANT DEFECTS			IF DEFECT WALLS  ARE PRESERVED	
HORIZONTAL AUGMENTATION	IN ASSOCIATION  WITH LAMINA	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 42






Sp-Block

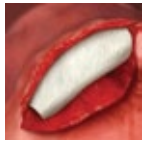
Collagenated heterologous cancellous block
For information on OsteoBiol® *Sp-Block*
see page 48


Evolution

Heterologous collagen membrane
For information on OsteoBiol® *Evolution*
see page 54

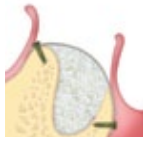




Lamina

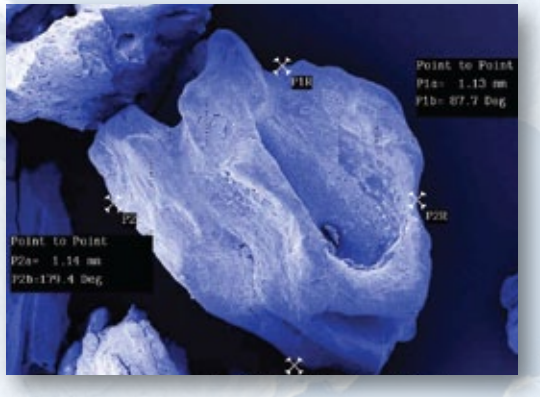
Collagenated heterologous cortical bone
For information on OsteoBiol® *Lamina*
see page 62

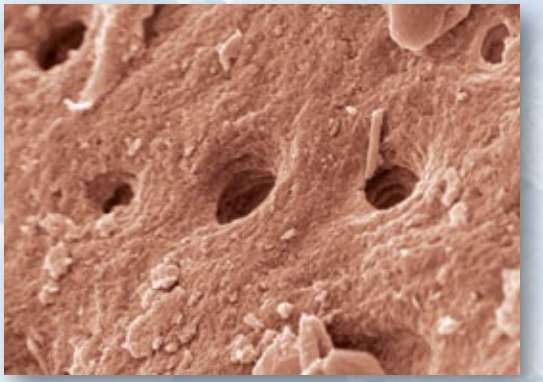



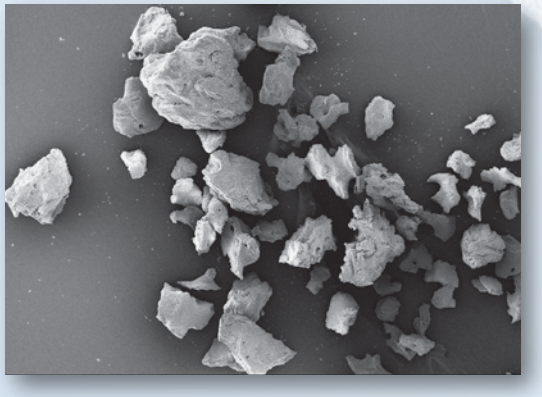
Derma

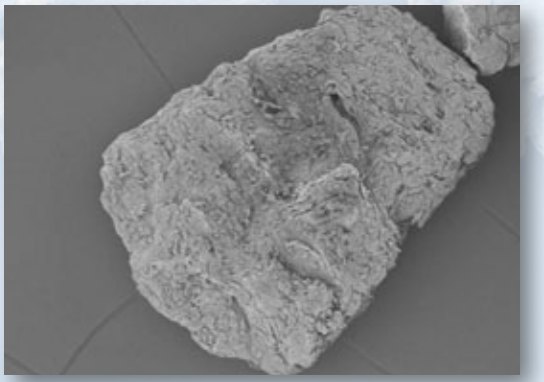
Collagen dermal matrix
For information on OsteoBiol® *Derma*
see page 58

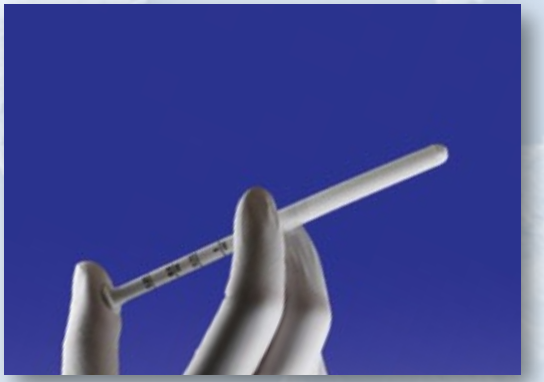

BONE SUBSTITUTES





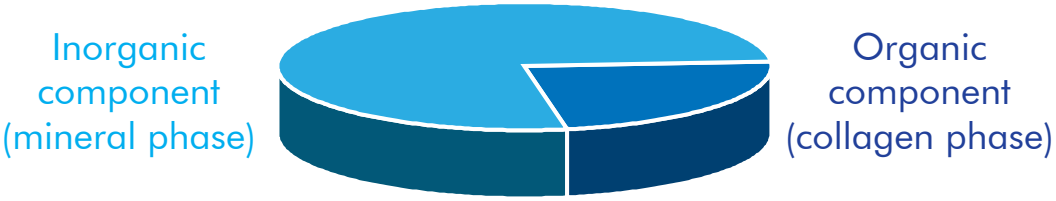






OsteoBiol® bone substitutes

HETEROLOGOUS BONE



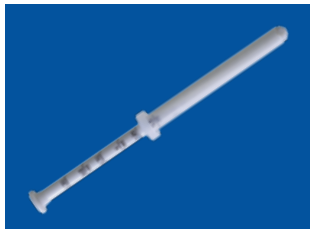
CORTICAL BONE — CANCELLOUS BONE

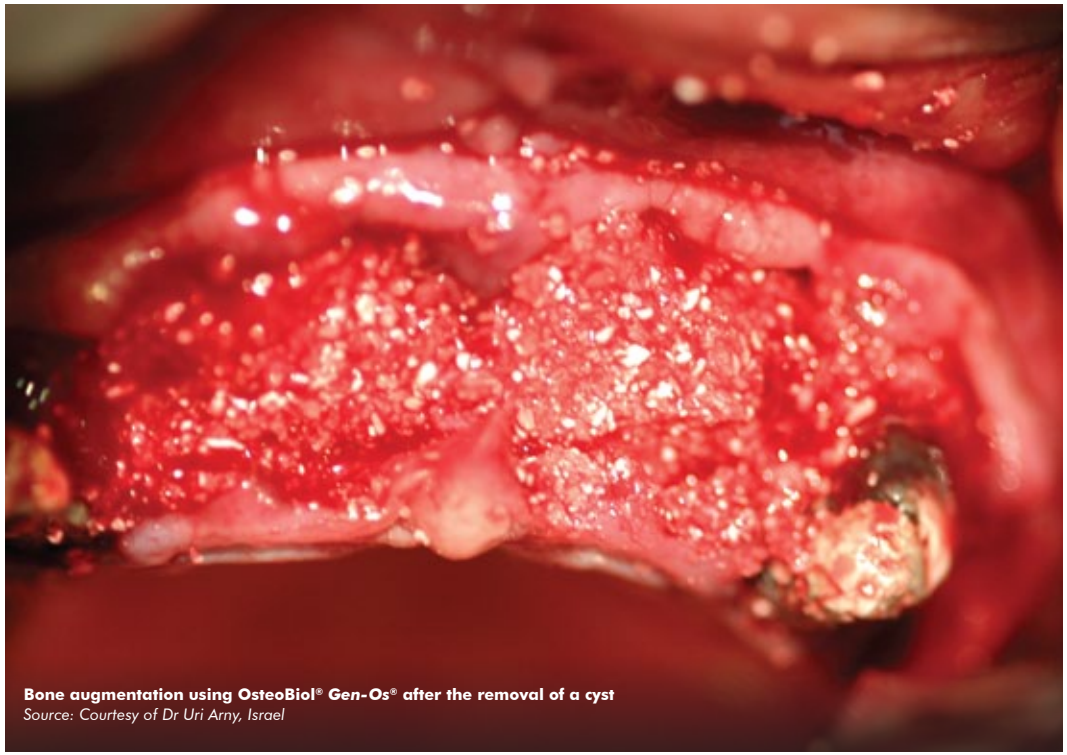
Collagenated mix

Collagen gel

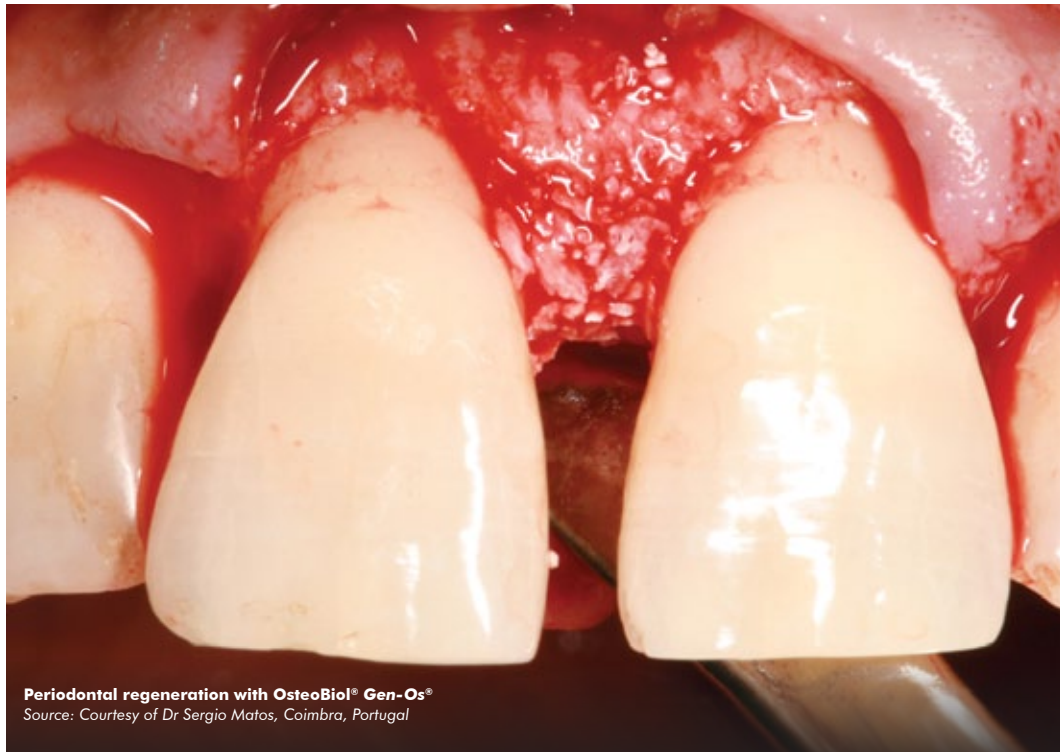
Apatos Cortical

cortical bone

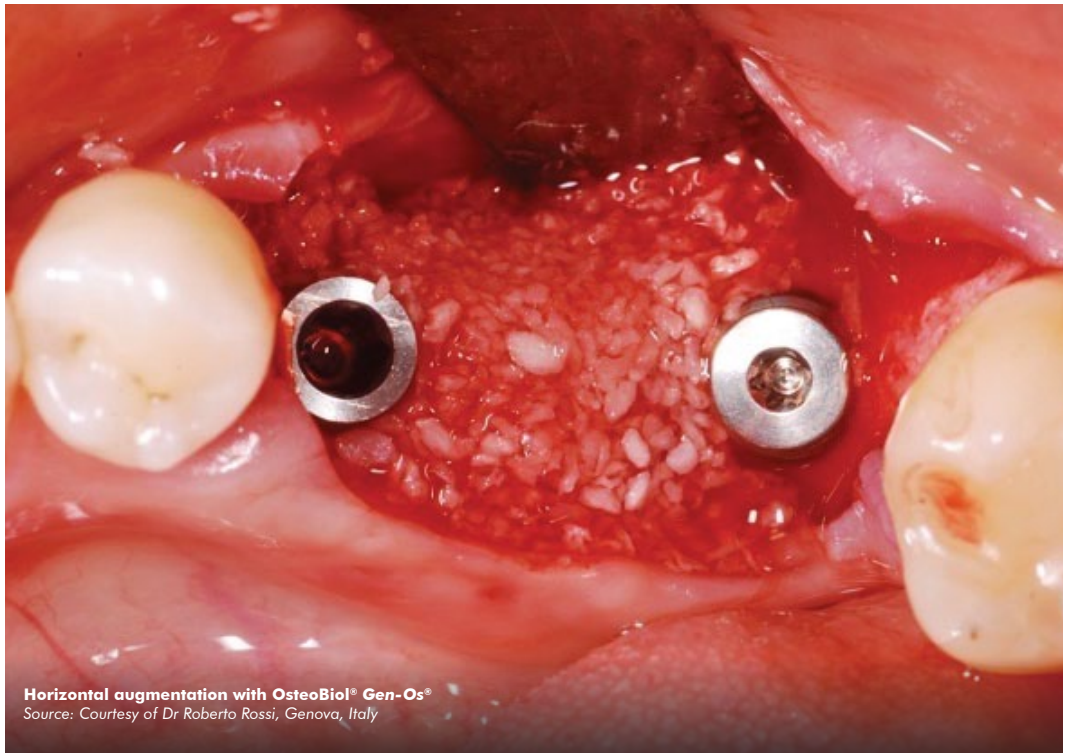
Gen-Os®	**mp3®** (Pre-hydrated)	**Putty** (Pre-hydrated)	**Gel 40** (Pre-hydrated)	**Apatos Mix**
100% collagenated bone mix	*90% collagenated bone mix* *10% collagen gel*	*80% collagenated bone mix* *20% collagen gel*	*60% collagenated bone mix* *40% collagen gel*	*cortico-cancellous bone mix*
				
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 22	For more information on OsteoBiol® *mp3*® see page 30	For more information on OsteoBiol® *Putty* see page 34	For more information on OsteoBiol® *Gel 40* see page 38	For more information on OsteoBiol® *Apatos* see page 42



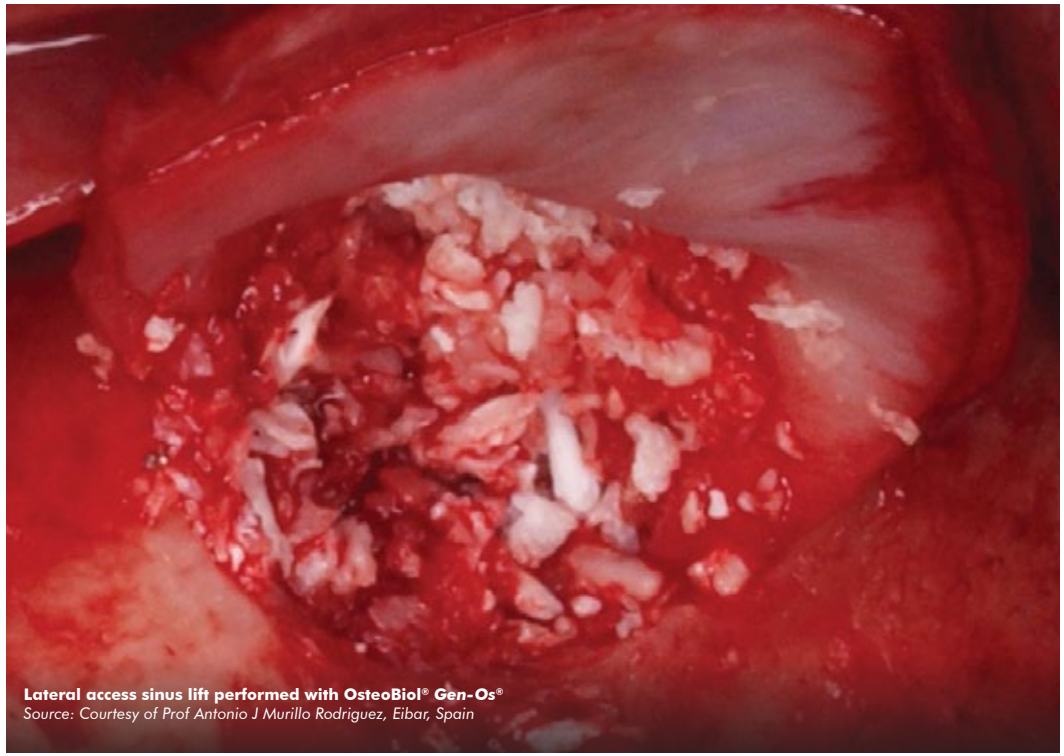
Bone augmentation using OsteoBiol® *Gen-Os*® after the removal of a cyst
Source: Courtesy of Dr Uri Arny, Israel



Periodontal regeneration with OsteoBiol® *Gen-Os*®
Source: Courtesy of Dr Sergio Matos, Coimbra, Portugal



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



Lateral access sinus lift performed with OsteoBiol® *Gen-Os*®
Source: Courtesy of Prof Antonio J Murillo Rodriguez, Eibar, 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

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 a highly osteoconductive properties[2]. 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 (osteoconductive property)[3,4].

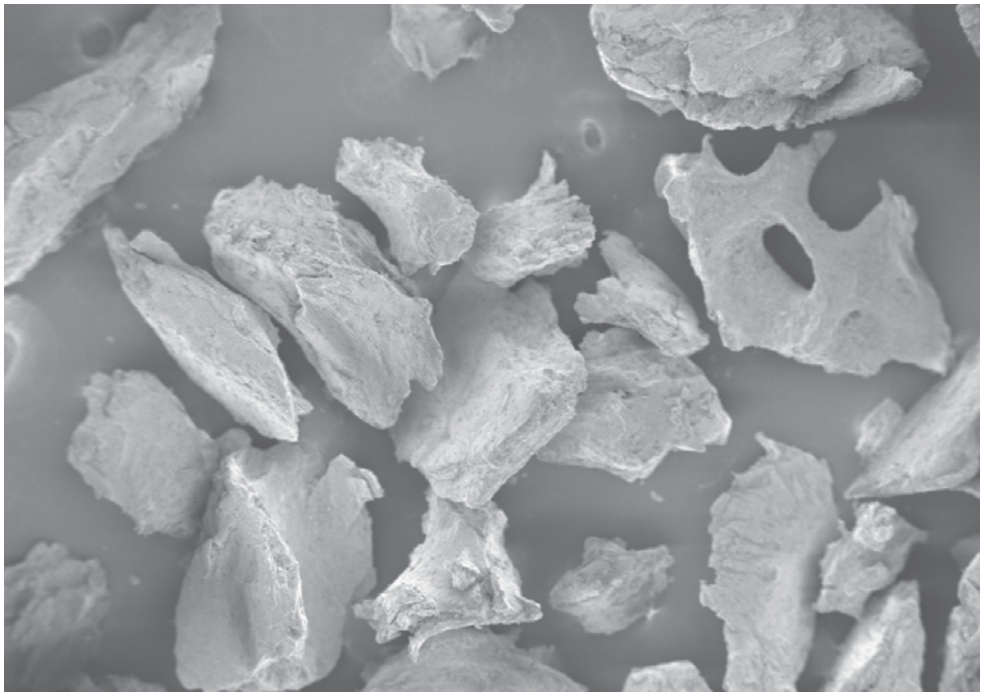
Moreover, thanks to its collagen content, the product facilitates blood clotting and the subsequent invasion of repairing and regenerative cells, favouring *restitutio ad integrum* of missing bone. Because of its marked *hydrophilia*[5], it can function as a carrier for selected medications and drugs[6].

HANDLING

Gen-Os® must always be hydrated and thoroughly mixed with *TSV Gel* or a few drops of sterile physiological solution to activate its collagen matrix and to enhance its adhesivity; it can also be mixed with patient's blood. If necessary it can as well be mixed with the drug selected for surgery.

ADVANTAGES

Gen-Os® expands up to 50% in volume after hydration with sterile saline: hydrated collagen contained in each granule also increases sensibly the biomaterial adhesivity.



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

Source: Tecnoss® Dental Media Library

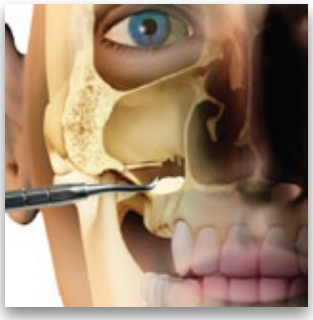
Clinical Indications

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[7] 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[8]. *Gen-Os*® is also indicated for lateral access maxillary sinus lift[4,9] and dehiscence regeneration[10], always in association with *Evolution* membranes.

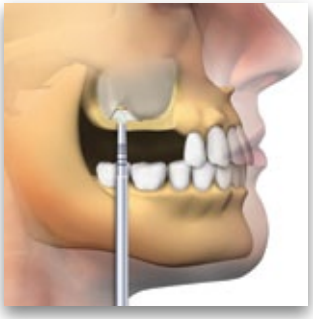
Ongoing studies are also proving its effectiveness in periodontal regeneration of deep intrabony defects. Due to its collagen content, once hydrated *Gen-Os*® becomes very sticky and hydrophylic[5]: it combines therefore extremely well with blood and is very stable once applied into the grafting site. 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 new bony tissue and ultimately, a successful implant rehabilitation.



LATERAL ACCESS SINUS LIFT
maxillary sinus floor augmentation
case reports on page 80

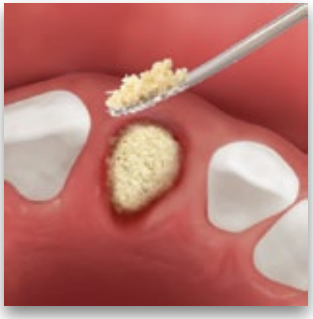
DEHISCENCES AND FENESTRATIONS
peri-implant lesions
case reports on page 76

PERIODONTAL REGENERATION
intrabony defects
case reports on page 88



CRESTAL ACCESS SINUS LIFT
osteotome technique
case reports on page 78

HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 83



ALVEOLAR REGENERATION
socket preservation
case reports on page 73

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. EPUB 2008 JAN 30

(3) 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

(4) 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, 2014 MAY 26 EPUB AHEAD OF PRINT

(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, 2014 SEP 15 EPUB AHEAD OF PRINT

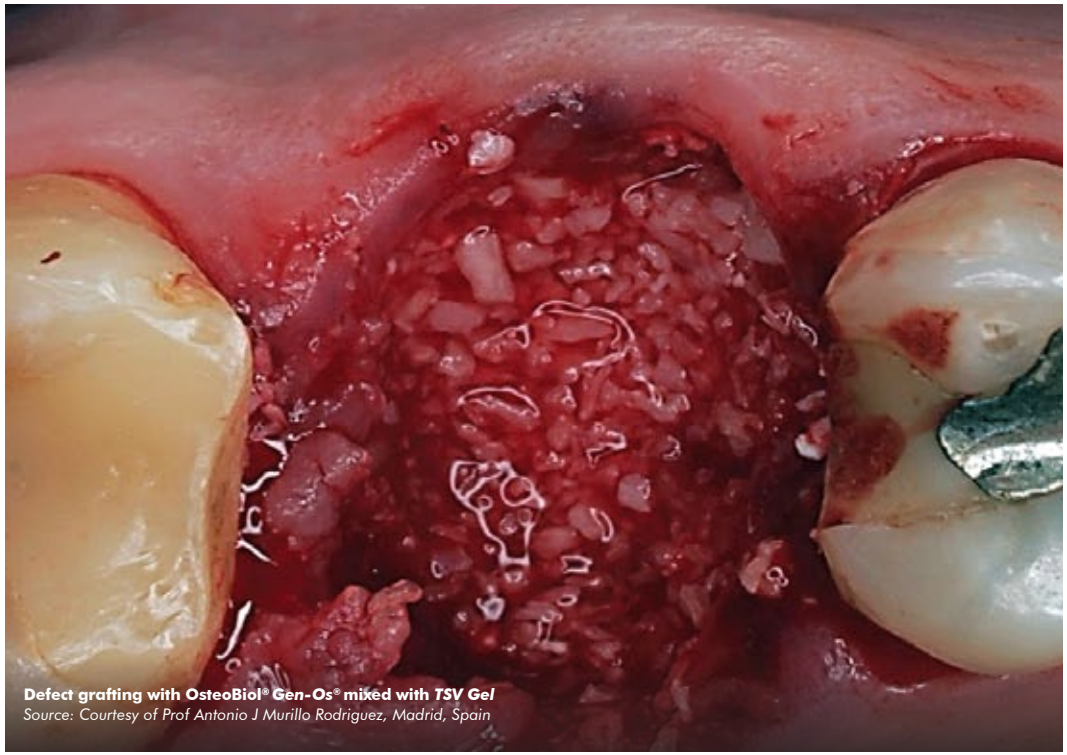
(7) FESTA VM, ADDABBO F, LAINO L, FEMIANO F, RULLO R
PORCINE-DERIVED XENOGRAFT COMBINED WITH A SOFT CORTICAL MEMBRANE VERSUS EXTRACTION ALONE FOR IMPLANT SITE DEVELOPMENT: A CLINICAL STUDY IN HUMANS
CLIN IMPLANT DENT RELAT RES, 2011 NOV 14, EPUB AHEAD OF PRINT

(8) 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

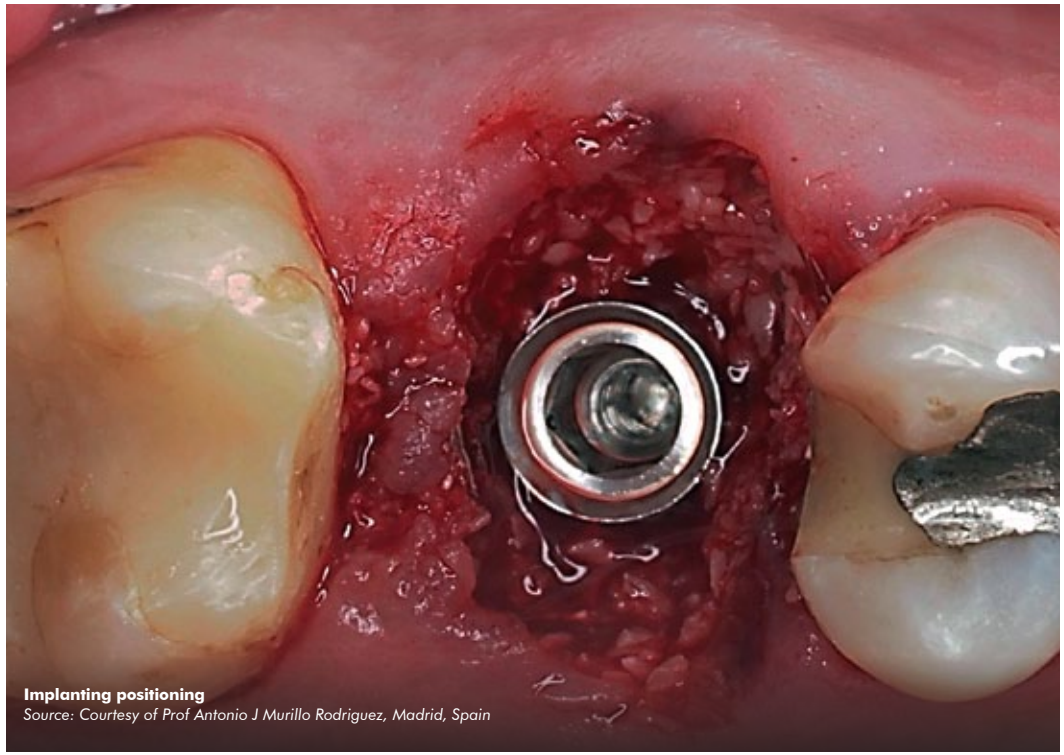
(9) BARONE A, CRESPI R, NICOLI ALDINI N, FINI M, GIARDINO R, COVANI U
MAXILLARY SINUS AUGMENTATION: HISTOLOGIC AND HISTOMORPHOMETRIC ANALYSIS
INT J ORAL MAXILLOFAC IMPLANTS, 2005, 20: 519-525

(10) BOTTINI LP, RICCI L, PIATTELLI A, PERROTTI V, IEZZI G
BUCCO-LINGUAL CRESTAL BONE CHANGES AROUND IMPLANTS IMMEDIATELY PLACED IN FRESH SOCKETS IN ASSOCIATION OR NOT WITH PORCINE BONE: A NON-BLINDED RANDOMIZED CONTROLLED TRIAL IN HUMANS
J PERIODONTOL, 2012 OCT 29, EPUB AHEAD OF PRINT

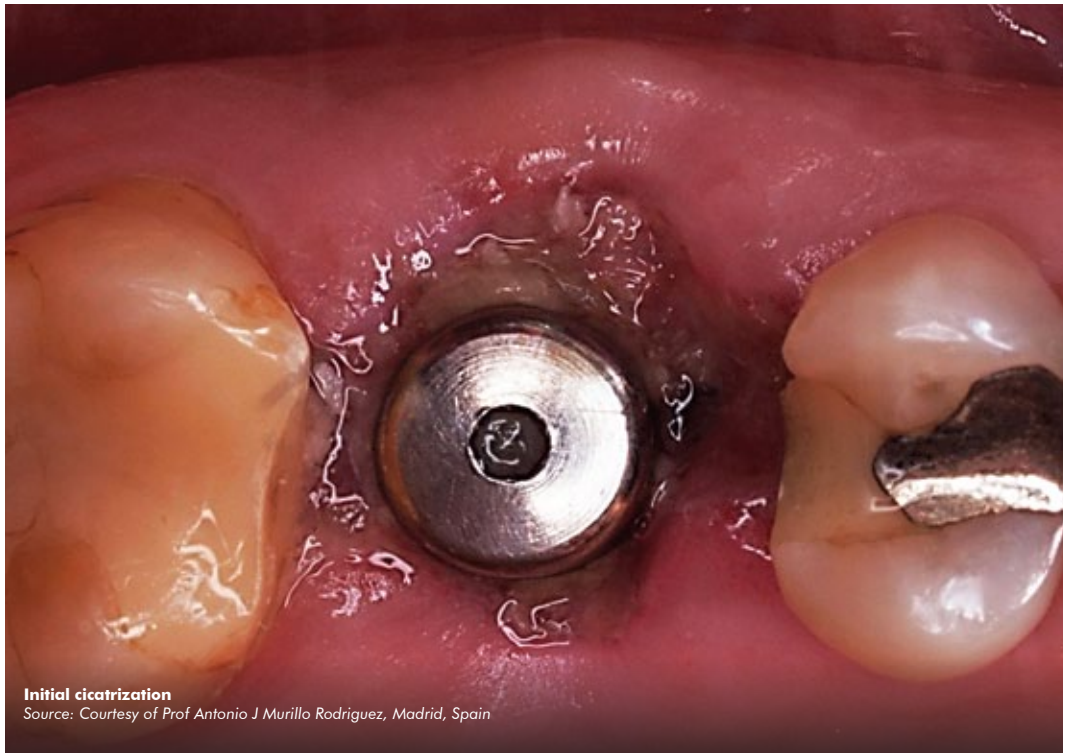
For further information see the complete literature on p. 110



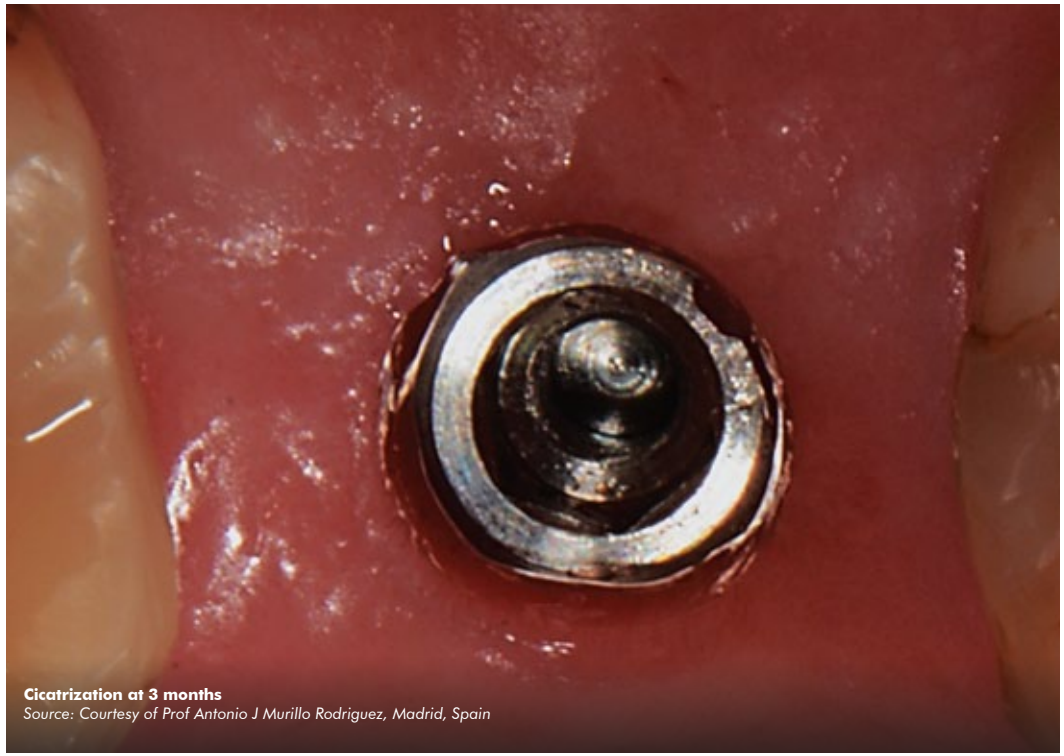
Defect grafting with OsteoBiol® Gen-Os® mixed with *TSV Gel*
Source: Courtesy of Prof Antonio J Murillo Rodriguez, Madrid, Spain



Implanting positioning
Source: Courtesy of Prof Antonio J Murillo Rodriguez, Madrid, Spain



Initial cicatrization
Source: Courtesy of Prof Antonio J Murillo Rodriguez, Madrid, Spain



Cicatrization at 3 months
Source: Courtesy of Prof Antonio J Murillo Rodriguez, Madrid, Spain

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*®
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

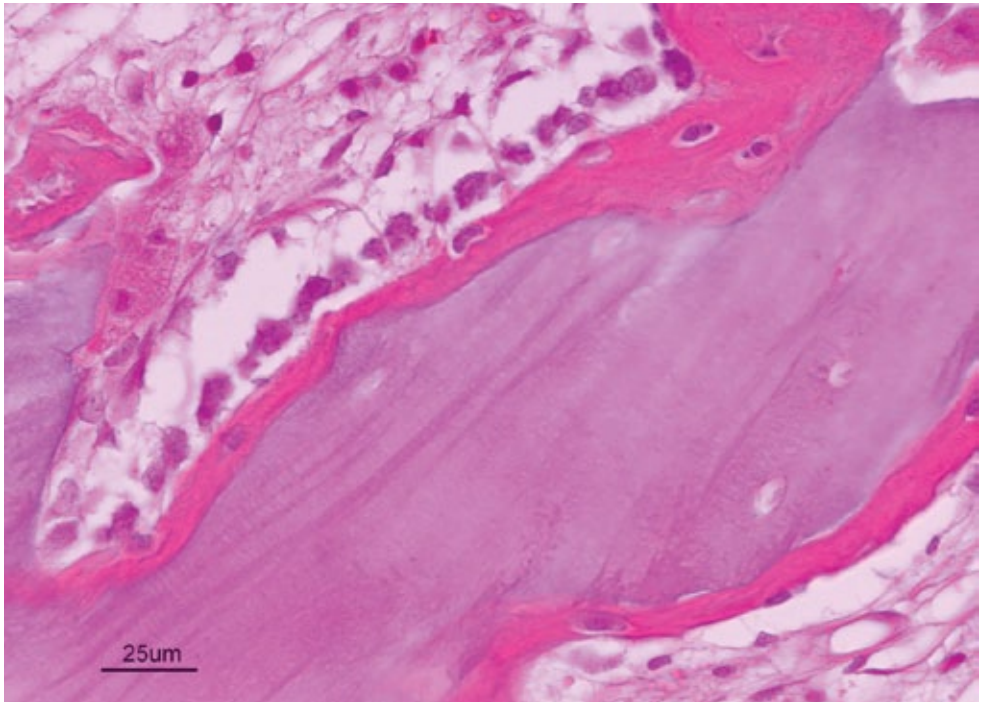
The purpose of this product is to provide mechanical stability to bone substitutes and barrier membranes.

OsteoBiol® *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 OsteoBiol® *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

OsteoBiol® *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 OsteoBiol® *Gen-Os*® or to apply on OsteoBiol® membranes.

At room temperature, the product remains at LV phase for few minutes, whereas once in situ its viscosity quickly increases with body temperature. OsteoBiol® *TSV Gel* in LV phase can be used instead of saline for hydrating and mixing with OsteoBiol® *Gen-Os*®. The result will be a sticky mixture easy to place and extremely stable once in situ. OsteoBiol® *TSV Gel* can also be applied to the rough side of the OsteoBiol® *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


Istituto Superiore di Sanità
ALLEGATO TECNICO
TECHNICAL SHEET

Clinical Indications

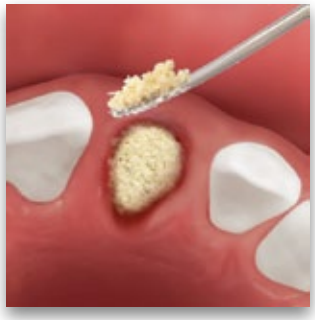
free animated videos
on OsteoBiol® APP

OsteoBiol® *TSV Gel* can be used in GBR procedures together with OsteoBiol® bone substitutes and membranes to enhance graft stability. The viscosity reached by OsteoBiol® *TSV Gel* at body temperature improves significantly the stability of *Gen-Os*® 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.
OsteoBiol® *TSV Gel* can also be used as a cicatrizing agent for the treatment of cutaneous and mucosal lesions.

DEHISCENCES AND FENESTRATIONS
peri-implant lesions
case reports on page 76

PERIODONTAL REGENERATION
intrabony defects
case reports on page 88

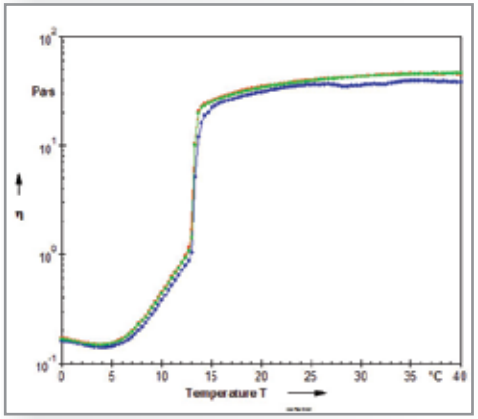
HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 83



ALVEOLAR REGENERATION
socket preservation
case reports on page 73

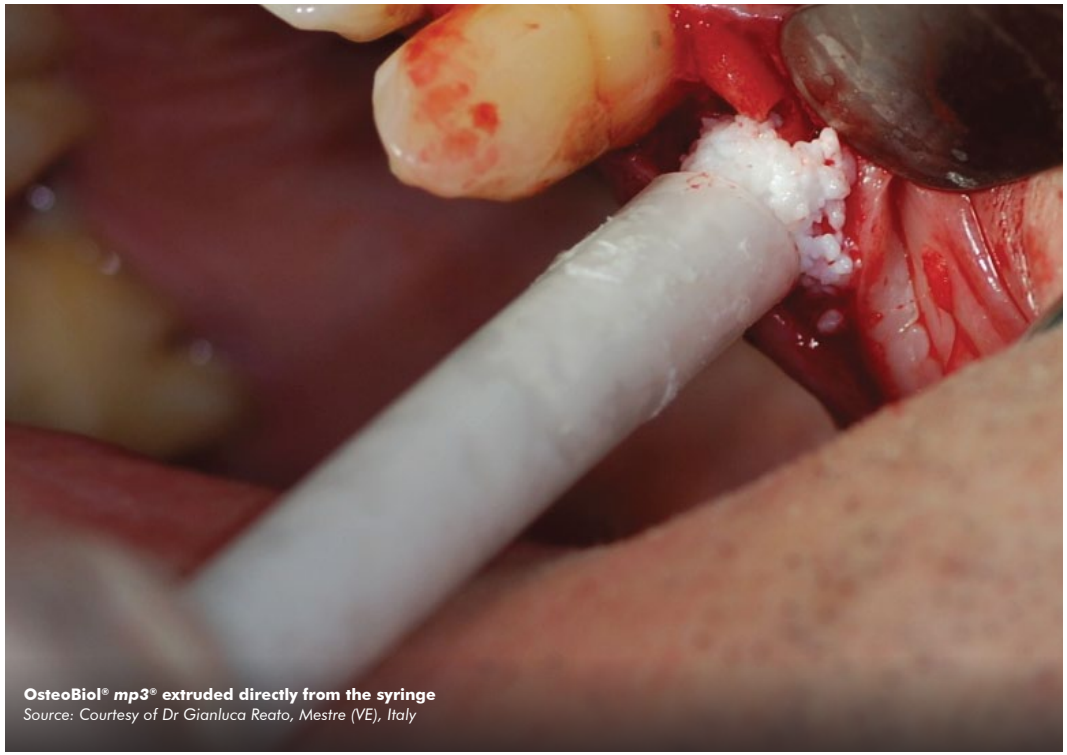
Additional case reports on osteobiol.com

OsteoBiol® *TSV Gel* GELIFICATION KINETICS

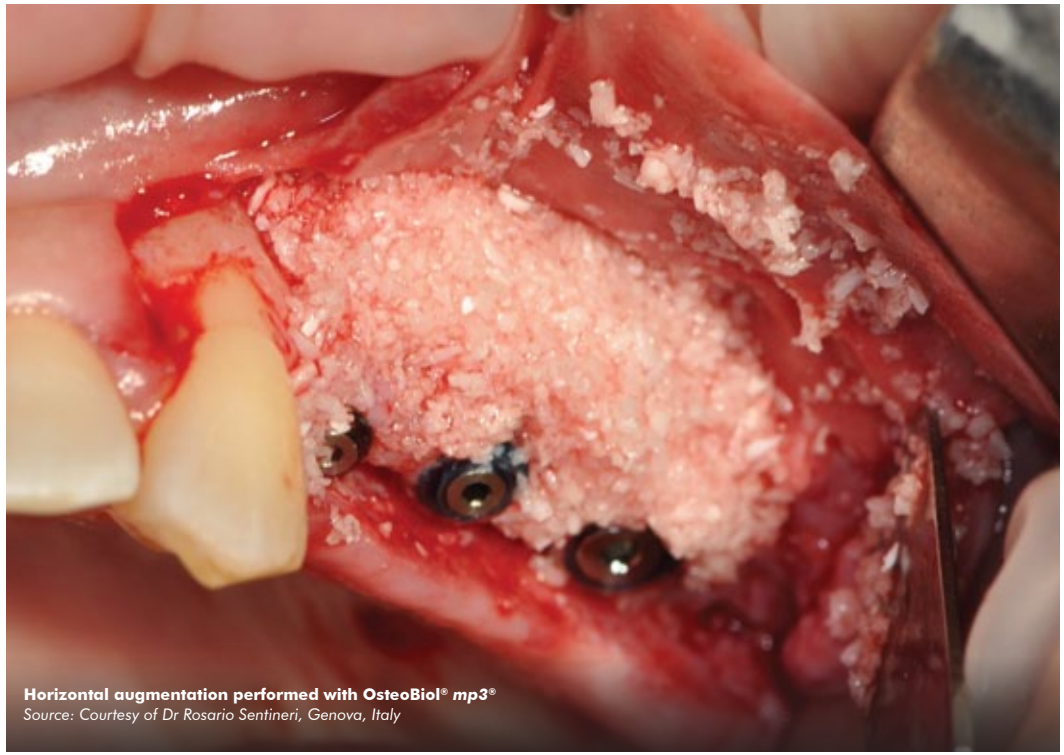


Source: Politecnico di Torino, Italy

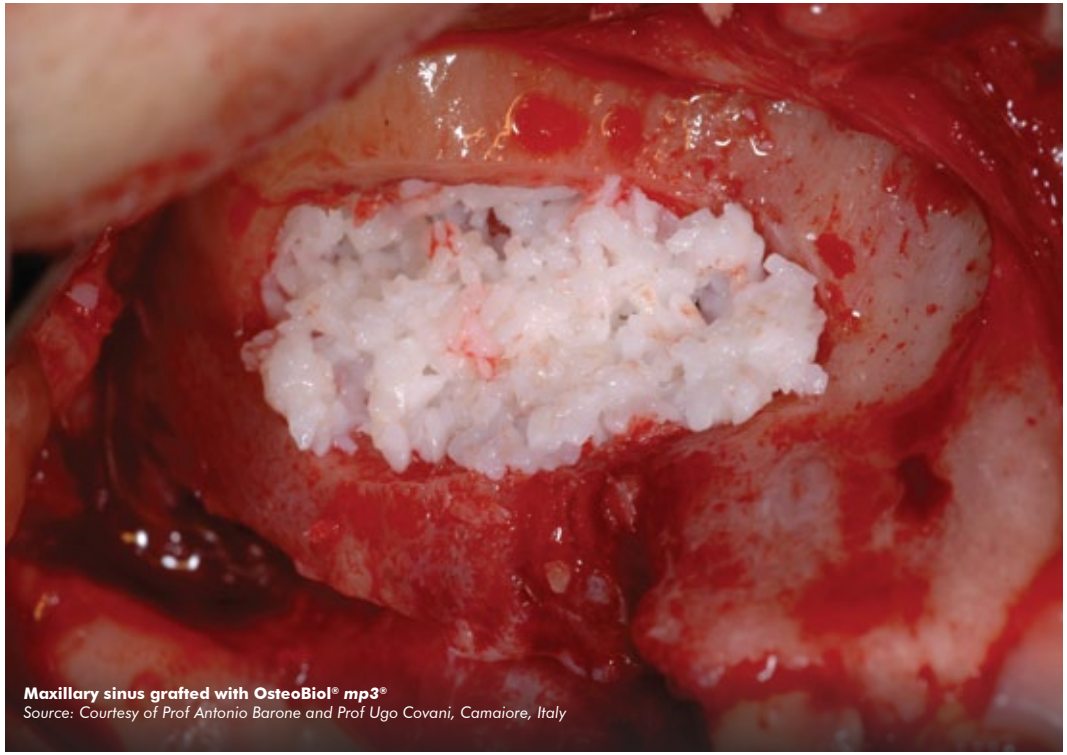
The graph shows the effect of temperature change on 3 OsteoBiol® *TSV Gel* samples.
As temperature increases from 0°C (1°C/min), the viscosity of the gel reaches its minimum at 4°C.
It then increases rapidly until it plateaus at 13°C. At room and body temperature OsteoBiol® *TSV Gel* is gel-like. It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



OsteoBiol® *mp3*® extruded directly from the syringe
Source: Courtesy of Dr Gianluca Reato, Mestre (VE), Italy



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

Alveolar regeneration with OsteoBiol® *mp3*®
Source: Courtesy of Dr Roberto Rossi, Genova, Italy

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

Re-entry time
About 5 months

Packaging
Syringe: 1.0 cc, 3x0.25 cc, 3x0.5 cc, 3x1.0 cc

Product codes
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

GMDN code
38746

Characteristics and handling

CHARACTERISTICS

Heterologous origin biomaterial made of 600-1000 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 material to pathogens during manipulation and grafting phases; furthermore the syringe is flexible and ideal to simplify grafting in the receiving site.

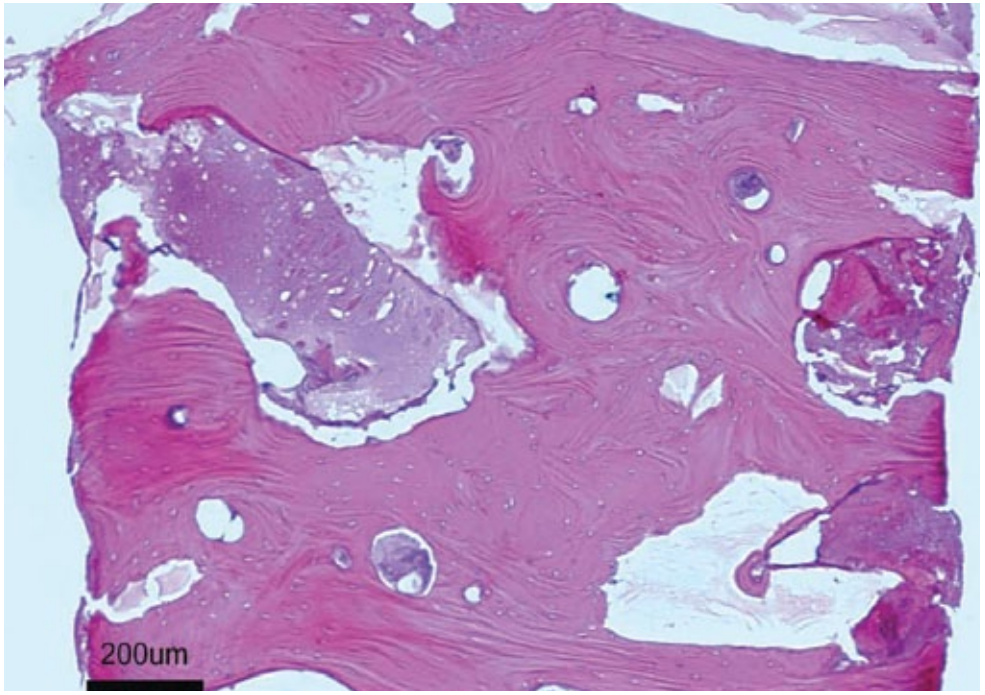
The granules are endowed with characteristics very similar to human mineral bone[1], and can be used as an alternative to autologous bone.

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

Gradually resorbable[2], it preserves the original graft shape and volume (osteoconductive property)[3,4,5].
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

The Tecnoss® patented manufacturing process used to obtain OsteoBiol® materials is able to achieve biocompatibility preserving part of the collagen matrix of the animal bone[6] and avoiding at the same time high temperatures that would cause ceramization of the granules: the result is a unique biomaterial, consisting of mineral component and organic matrix, with a porous surface extremely similar to autogenous bone and able to resorb progressively while new bone formation takes place[2].

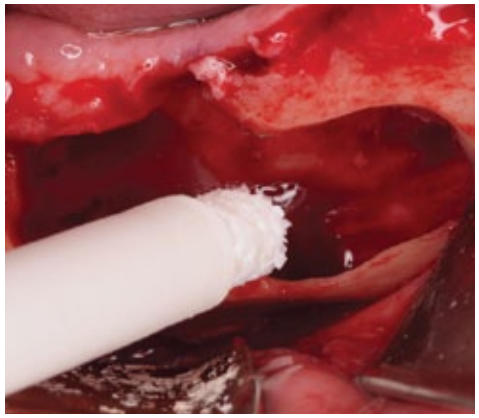
mp3®, a pre-hydrated cortico-cancellous bone mix with 10% collagen gel, has been developed with this innovative biotechnology and is a "ready-to-use" product.

mp3® main indication is lateral access maxillary sinus lift[3,7,8], 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[9]: 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.

Finally, *mp3*® is also indicated for horizontal augmentation (two wall defects) in combination with autogenous bone blocks[10] or with OsteoBiol® *Lamina*[11]: 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, a healthy new bony tissue and ultimately, a successful implant rehabilitation.



***mp3*® grafted after the removal of a cyst**
Source: Courtesy of Prof Antonio J. Murillo Rodriguez, Eibar, Spain

Ridge preservation with OsteoBiol® *mp3*®
Source: Courtesy of Dr Roberto Rossi, Genova, Italy

LATERAL ACCESS SINUS LIFT
maxillary sinus floor augmentation
case reports on page 80

ALVEOLAR REGENERATION
post-extractive sockets
case reports on page 73

HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 83

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) 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 EPUB 2010 MAY 11

(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. EPUB 2008 JAN 30

(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, 2012 JAN 26, EPUB AHEAD OF PRINT

(4) CALVO GUIRADO JL, RAMIREZ FERNANDEZ MP, NEGRI B, DELGADO RUIZ RA, MATÉ SANCHEZ DE VAL JE, GOMEZ MORENO G
EXPERIMENTAL MODEL OF BONE RESPONSE TO COLLAGENIZED XENOGRAFTS OF PORCINE ORIGIN (OSTEOBIOL® *mp3*®): A RADIOLOGICAL AND HISTOMORPHOMETRIC STUDY
CLIN IMPLANT DENT RELAT RES, 2013 FEB;15(1):143-51 EPUB 2011 MAR 31

(5) RAMIREZ FERNANDEZ MP, CALVO GUIRADO JL, DELGADO RUIZ RA, MATÉ SANCHEZ DE VAL JE, VICENTE ORTEGA V, MESEGUER OLMOS L
BONE RESPONSE TO HYDROXYAPATITES WITH OPEN POROSITY OF ANIMAL ORIGIN (PORCINE OSTEOBIOL® *mp3*®) AND BOVINE (ENDOBON®): A RADIOLOGICAL AND HISTOMORPHOMETRIC STUDY
CLIN ORAL IMPLANTS RES, 2011 JUL; 22(7):767-73

(6) 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

(7) 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

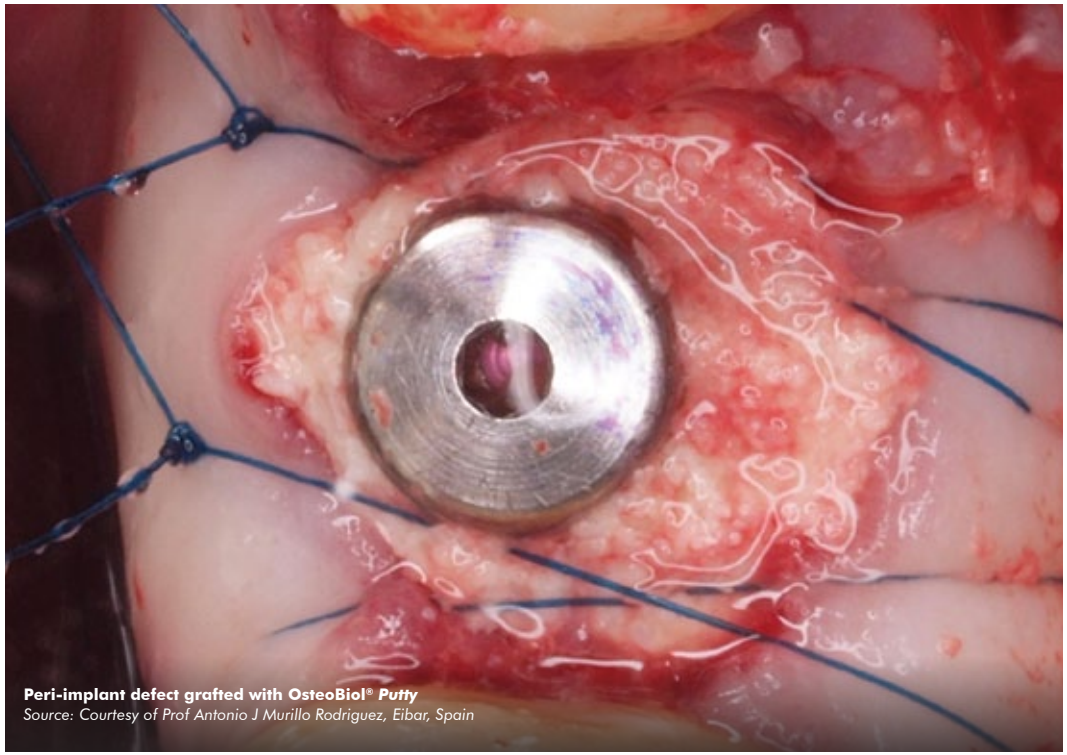
(8) PAGLIANI L, ANDERSSON P, LANZA M, NAPPO A, VERROCCHI D, VOLPE S, SENNERBY L
A COLLAGENATED PORCINE BONE SUBSTITUTE FOR AUGMENTATION AT NEOSS IMPLANT SITES: A PROSPECTIVE 1-YEAR MULTICENTER CASE SERIES STUDY WITH HISTOLOGY
CLIN IMPLANT DENT RELAT RES, 2012 OCT;14(5):746-58 EPUB 2010 OCT 26

(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

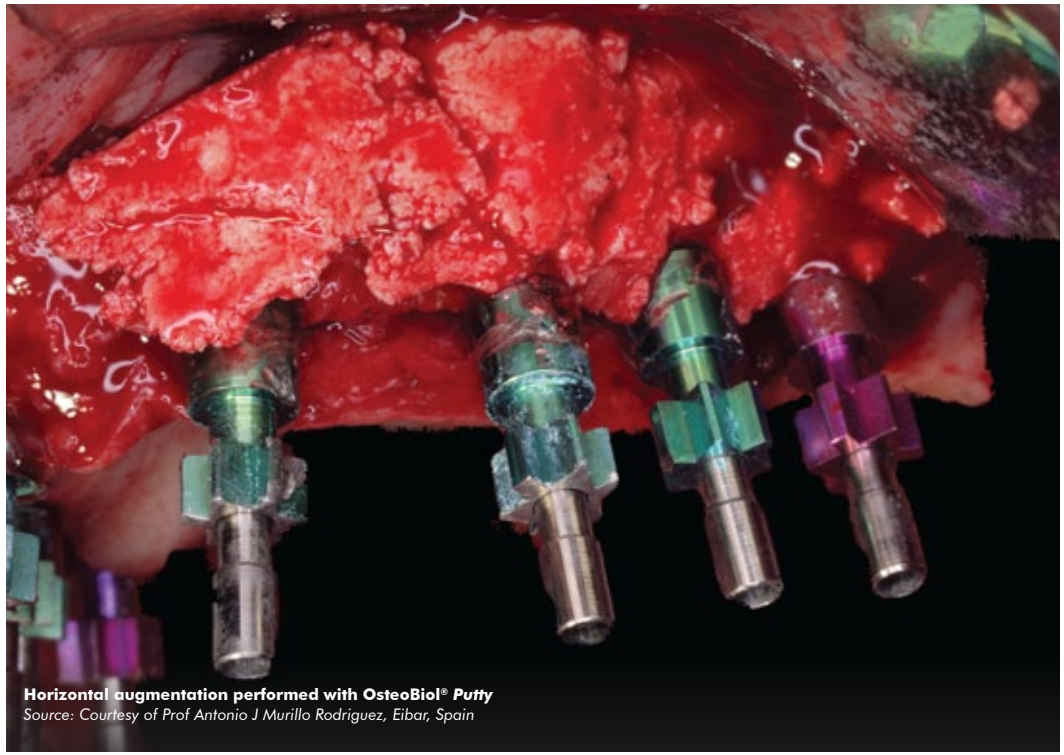
(10) BARONE A, COVANI U
MAXILLARY ALVEOLAR RIDGE RECONSTRUCTION WITH NONVASCULARIZED AUTOGENOUS BLOCK BONE: CLINICAL RESULTS
J ORAL MAXILLOFAC SURG, 2007, 65:2039-2046

(11) 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

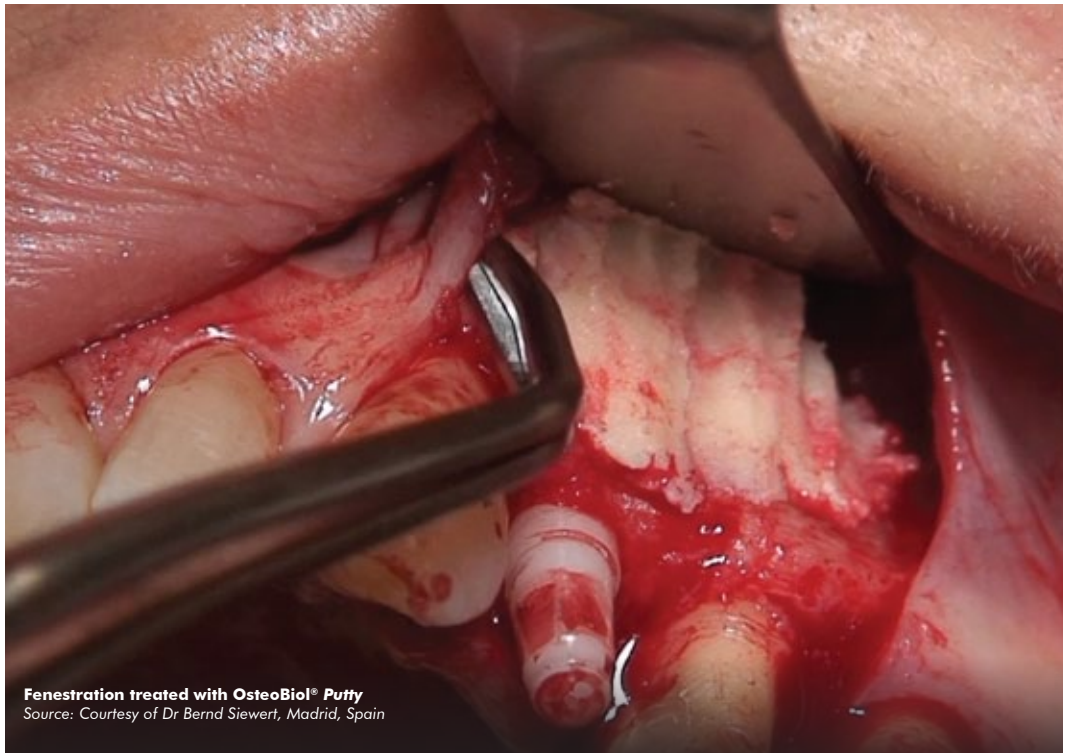
For further information see the complete literature on p. 110



Peri-implant defect grafted with OsteoBiol® *Putty*
Source: Courtesy of Prof Antonio J Murillo Rodriguez, Eibar, Spain



Horizontal augmentation performed with OsteoBiol® *Putty*
Source: Courtesy of Prof Antonio J Murillo Rodriguez, Eibar, Spain



Fenestration treated with OsteoBiol® *Putty*
Source: Courtesy of Dr Bernd Siewert, Madrid, Spain

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: 0.5 cc, 1.0 cc, 3x0.5 cc, 3x0.25 cc

Product codes
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
Wide tip
HPT61S | 1 Syringe | 1.0 cc | Porcine
HPT61E | 1 Syringe | 1.0 cc | Equine

GMDN code
38746

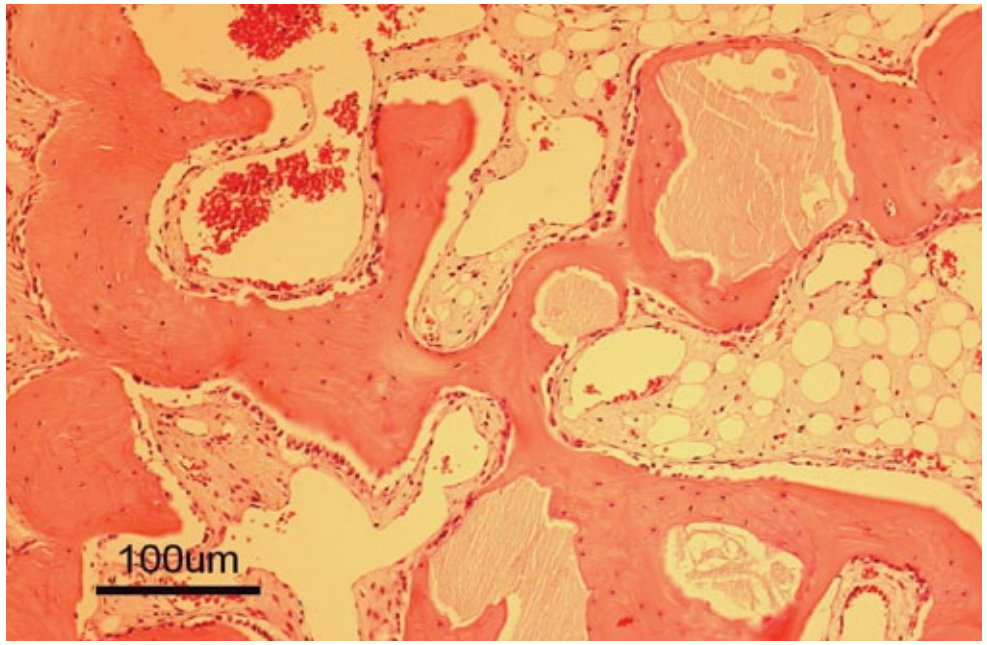
Characteristics and handling

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 in sockets and 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

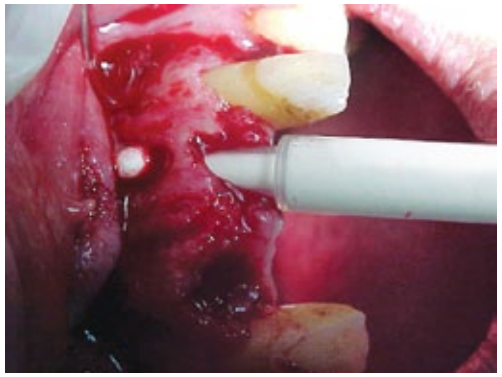
Source: Tecnoss® Dental Media Library

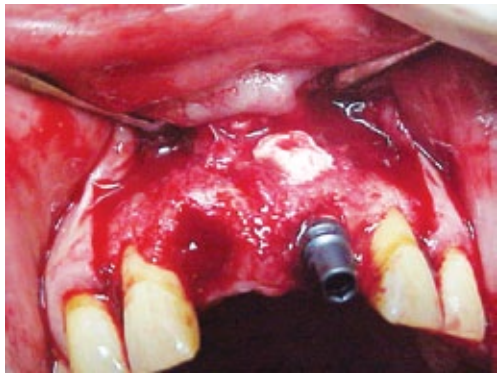
Clinical Indications

free animated videos
on OsteoBiol® APP

The exclusive Tecnoss® manufacturing process guarantees an exceptional malleability and plasticity: furthermore the syringe provides *Putty* extraordinary handling properties making this product the ideal choice for post-extractive sockets[2], self-contained peri-implant defects and all defects that present a self-contained cavity. Thanks to the collagen component, *Putty* facilitates blood clotting and the subsequent invasion of repairing and regenerative cells. 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[4,5].

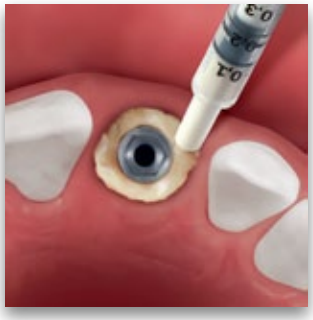
The product versatility also makes *Putty* the ideal solution when bone tissue has been lost due to peri-implantitis as long as the containing walls are present. In fact, the primary condition for gaining a successful regeneration is to achieve the biomaterial initial stability. Therefore, *Putty* must be used only in self contained defects where the surrounding walls guarantee such condition: for example post-extractive sockets and inside the bone crest when ridge-split technique is adopted[6].





Fenestration grafted with OsteoBiol® *Putty*. Grafting site protected with OsteoBiol® *Evolution* membrane
Source: Courtesy of Dr Atef Ismail Mohamed, Cairo, Egypt

ALVEOLAR REGENERATION
post-extractive sockets
case reports on page 73



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ridge split
case reports on page 83

Additional case reports on osteobiol.com

BIBLIOGRAPHY

(1) CALVO GUIRADO JL, GOMEZ MORENO G, GUARDIA J, ORTIZ RUIZ A, PIATTELLI A, BARONE A, MARTÌNEZ GONZÀLEZ JM, MESENGUER OLMO L, LÒPEZ MARÌ L, DORADO CB
BIOLOGICAL RESPONSE TO PORCINE XENOGRAFT IMPLANTS: AN EXPERIMENTAL STUDY IN RABBITS
IMPLANT DENT, 2012 APR;21(2):112-7

(2) ARCURI C, CECCHETTI F, GERMANO F, MOTTA A, SANTACROCE C
CLINICAL AND HISTOLOGICAL STUDY OF A XENOGENIC SUBSTITUTE USED AS A FILLER IN POSTEXTRACTIVE ALVEOLUS
MINERVA STOMATOL, 2005, 54: 351-362.

(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

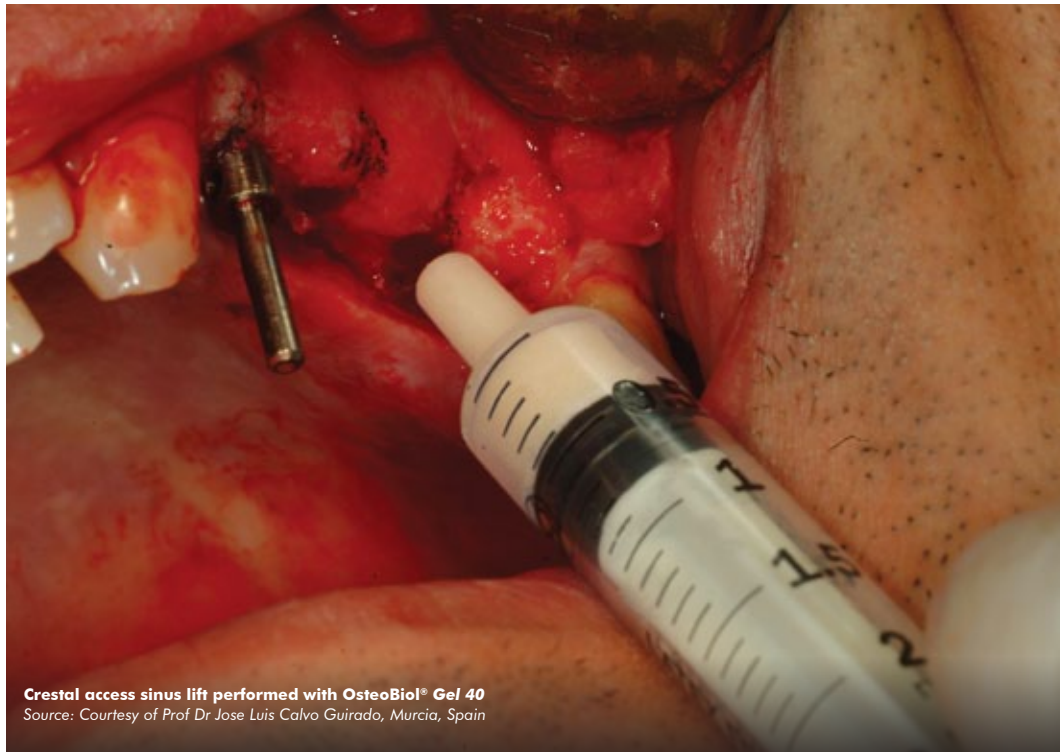
(4) BARONE A, AMERI S, COVANI U
IMMEDIATE POSTEXTRACTION IMPLANTS: TREATMENT OF RESIDUAL PERI-IMPLANT DEFECTS. A RETROSPECTIVE ANALYSIS
EUR J IMPLANT PROSTHODONTICS, 2006, 2: 99-106

5) 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

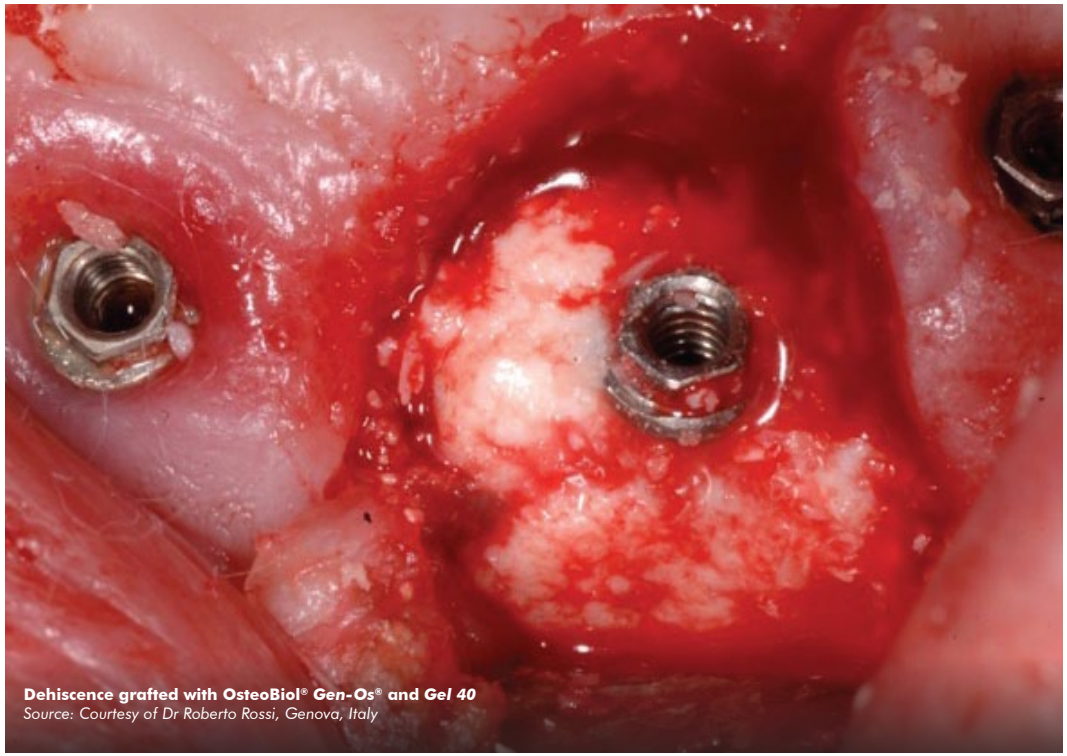
(6) CALVO GUIRADO JL, PARDO ZAMORA G, SAEZ YUGUERO MR
RIDGE SPLITTING TECHNIQUE IN ATROPHIC ANTERIOR MAXILLA WITH IMMEDIATE IMPLANTS, BONE REGENERATION AND IMMEDIATE TEMPORISATION: A CASE REPORT
J IR DENT ASSOC, 2007 WINTER, 53(4):187-90

For further information see the complete literature on p. 110

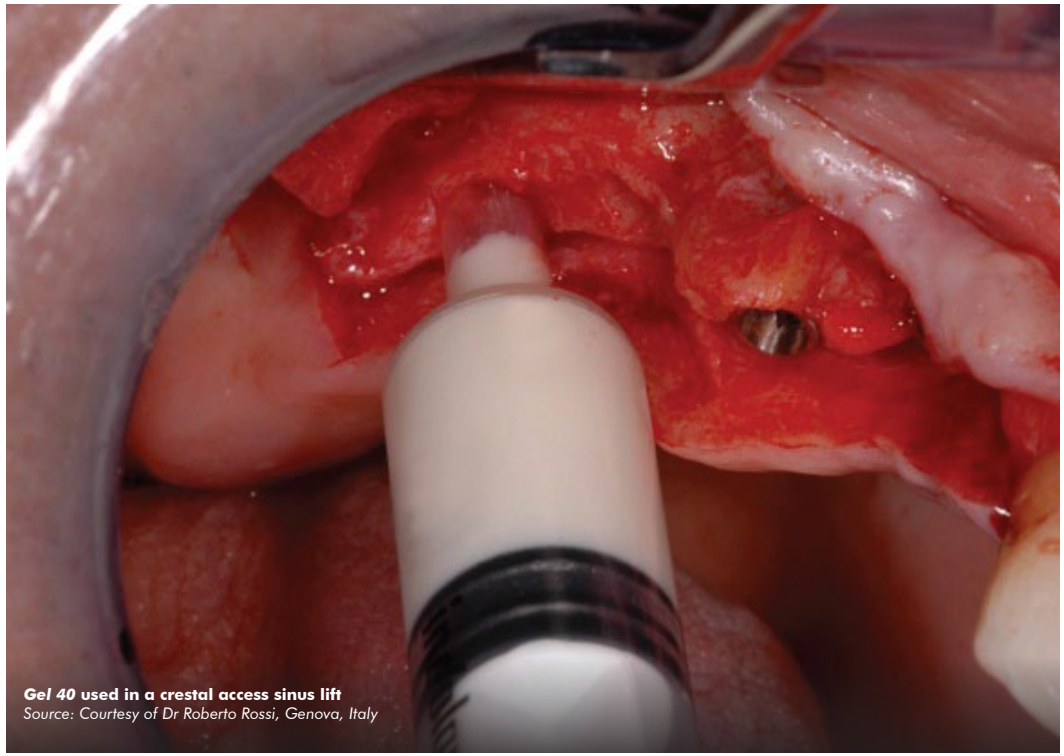
Intrabony defect grafted with OsteoBiol® *Gel 40*
Source: Courtesy of Dr Walter Rao, Pavia, Italy



Crestal access sinus lift performed with OsteoBiol® *Gel 40*
Source: Courtesy of Prof Dr Jose Luis Calvo Guirado, Murcia, Spain



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

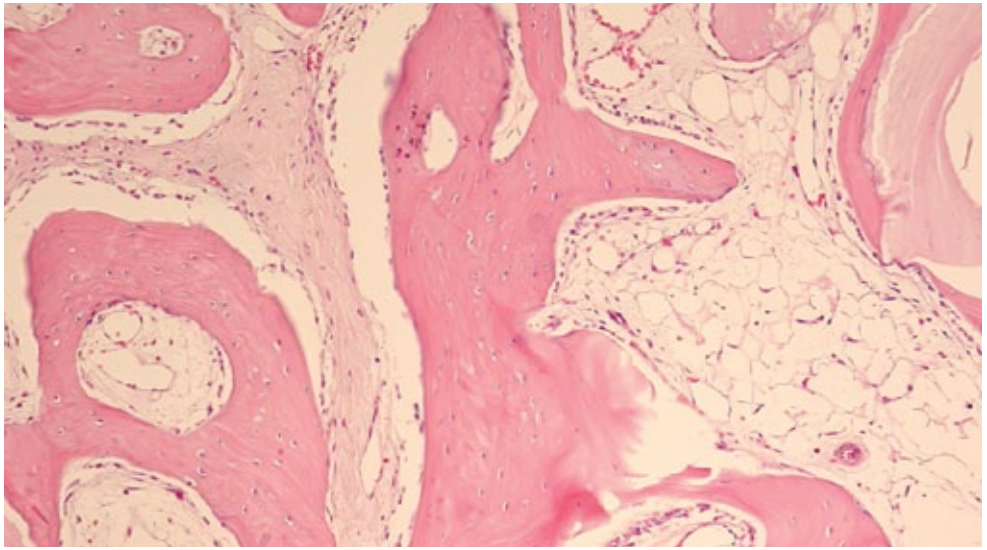
Characteristics and handling

CHARACTERISTICS

Gel 40 is made of a collagen matrix (type I and III) obtained using exclusive Tecnoss® process, loaded for 60% of its volume with micronized heterologous bone (granulometry up to 300 μm). The product is in a gel state at temperatures below 30° C; at higher temperatures the viscosity is reduced and *Gel 40* can be mixed with hydrosoluble and/or liposoluble drugs. 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. Placed on site *Gel 40* combines with blood, contributing to the fast and compact formation of primary blood clot.

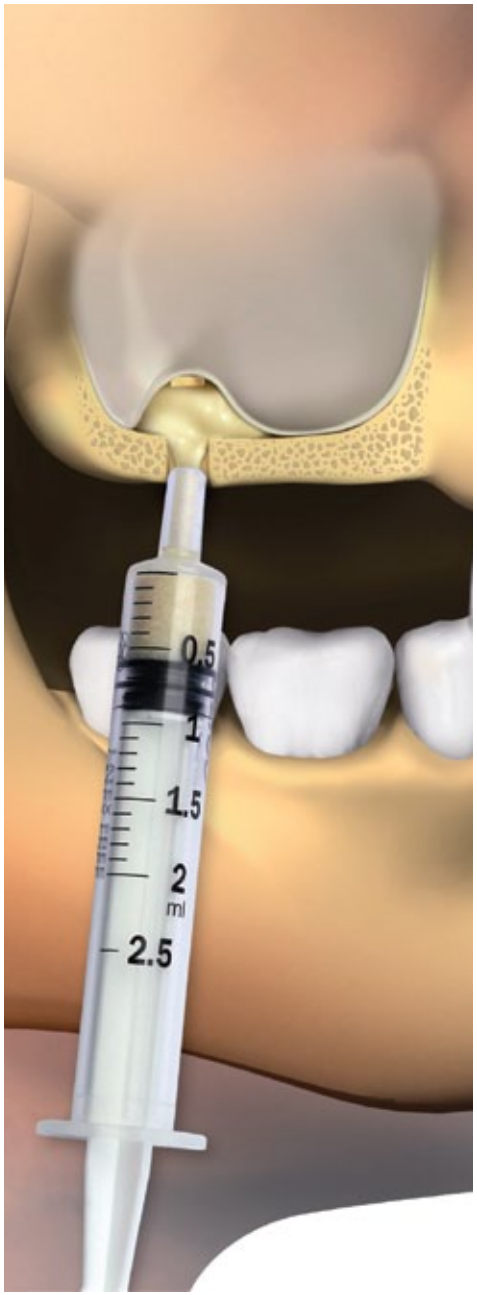


Part of a biopsy showing newly formed bone after treatment with OsteoBiol® *Gel 40*. Biopsies were taken 5 weeks after implantation in rabbit maxillae. Htx-eosine. Original magnification x20
Source: Histology by Prof Ulf Nannmark, University of Göteborg, Sweden

Source: Tecnoss® Dental Media Library

Clinical Indications

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 gingival recessions[4]. Thanks to the collagen component, *Gel 40* facilitates blood clotting and the subsequent invasion of repairing and regenerative cells. 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]. *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 88

CRESTAL ACCESS SINUS LIFT
crestal sinus floor augmentation
case reports on page 78

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 DEC; 36(6):485-489

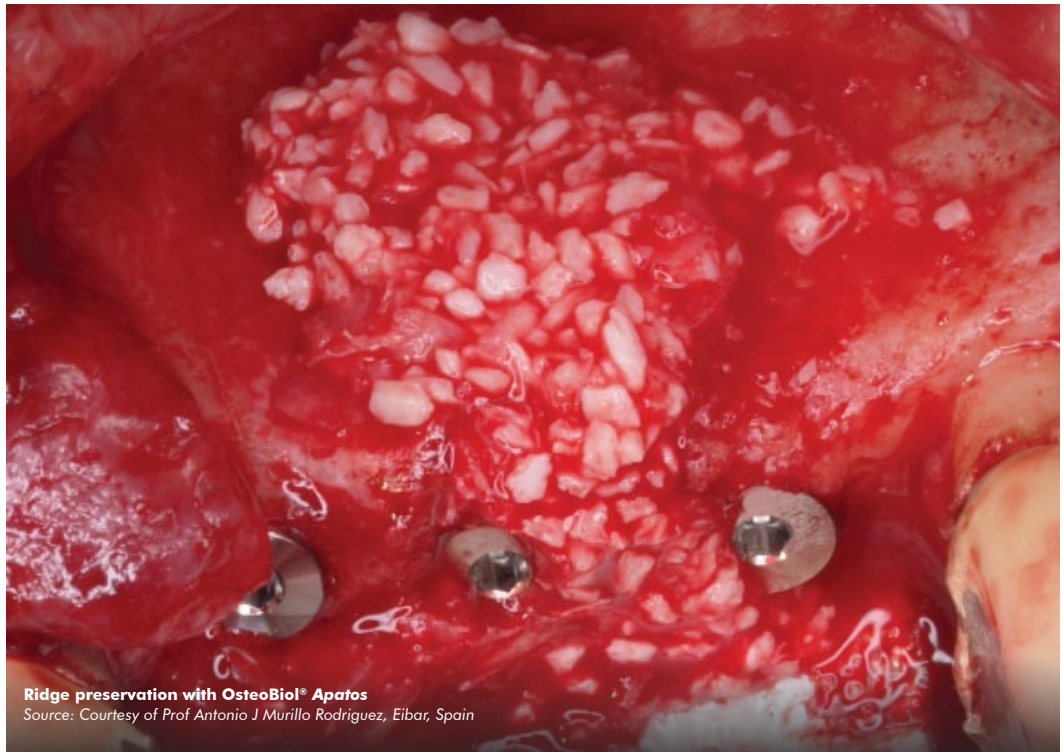
(3) COVANI U, CORNELINI R, BARONE A
BUCCAL BONE AUGMENTATION AROUND IMMEDIATE IMPLANTS WITH AND WITHOUT FLAP ELEVATION: A MODIFIED APPROACH
INT J ORAL MAXILLOFAC IMPLANTS, 2008 SEP-OCT; 23(5):841-6

(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

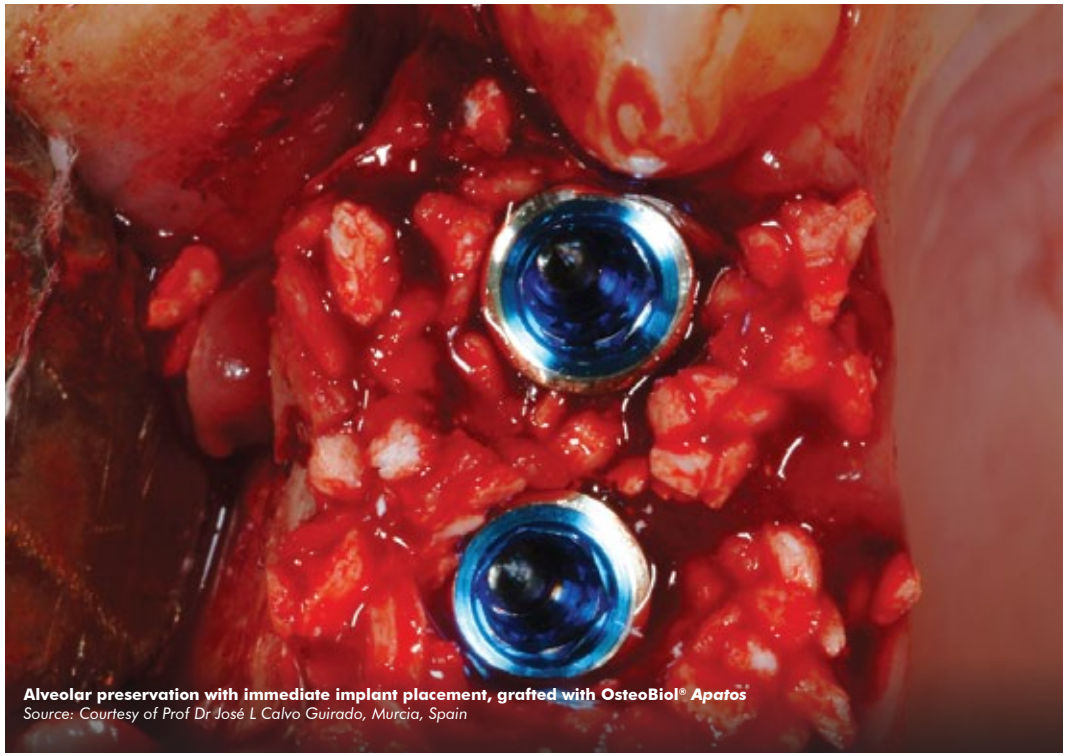
(5) NANNMARK U, AZARMEHR I
SHORT COMMUNICATION: COLLAGENATED CORTICOCANCELLOUS PORCINE BONE GRAFTS. A STUDY IN RABBIT MAXILLARY DEFECTS
CLIN IMPLANT DENT RELAT RES, 2010 JUN 1; 12(2):161-3

For further information see the complete literature on p. 110

Sinus cavity grafted with OsteoBiol® *Apatos*
Source: Courtesy of Dr Bruno Negri and Prof Dr José L Calvo Guirado, Spain



Ridge preservation with OsteoBiol® *Apatos*
Source: Courtesy of Prof Antonio J Murillo Rodriguez, Eibar, Spain



Alveolar preservation with immediate implant placement, grafted with OsteoBiol® *Apatos*
Source: Courtesy of Prof Dr José L Calvo Guirado, Murcia, Spain

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

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

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
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

GMDN code
38746

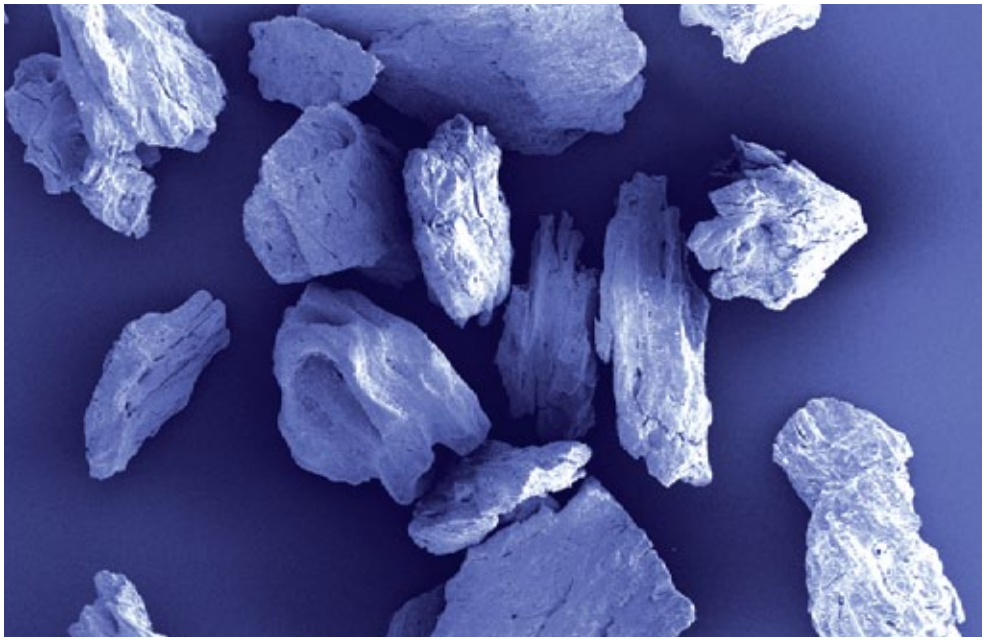
Characteristics and handling

CHARACTERISTICS

Apatos is a biocompatible[1], osteoconductive[2] biomaterial of heterologous origin with characteristics similar to mineralized human bone[3,4]; 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[5], 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; 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

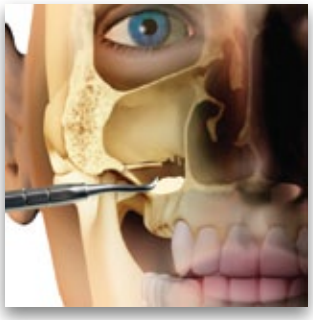
Clinical Indications

free animated videos
on OsteoBiol® APP

Apatos is a universal filler, that can be used to treat peri-implant defects and two-wall defects[6,7]. Because of its granulometry, *Apatos* cannot be used in narrow defects, but it fits well in big sockets, e.g. after molar extractions[8]. Both types of sinus lift (with crestal or lateral access)[4,9] can be performed with *Apatos* as bone substitute, as well as surgeries for horizontal regenerations.

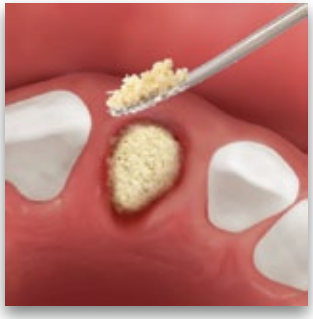
Apatos Cortical is characterized by a very long resorption time, guaranteeing optimal preservation of the graft volume.

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

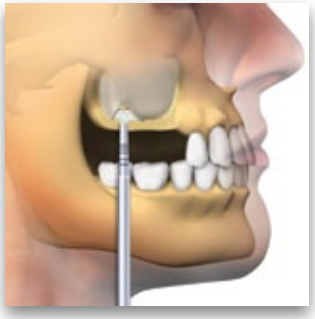


LATERAL ACCESS SINUS LIFT
maxillary sinus floor augmentation
case reports on page 80

DEHISCENCES AND FENESTRATIONS
peri-implant grafting
case reports on page 76



ALVEOLAR REGENERATION
socket preservation
case reports on page 73



CRESTAL ACCESS SINUS LIFT
osteotome sinus floor augmentation
case reports on page 78

HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 83

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) 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

(3) 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

(4) 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

(5) EZZI 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 EPUB 2011 NOV 2

(6) 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

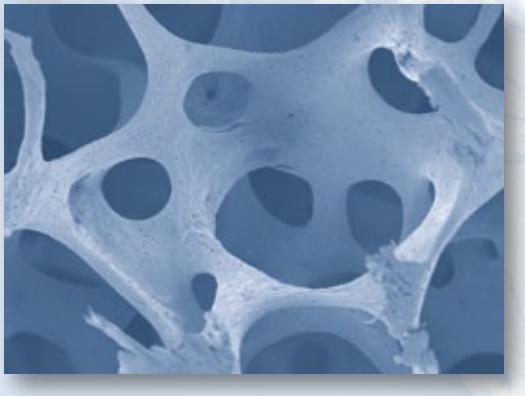
(7) BARONE A, TOTI P, QUARANTA A, DERCHI G, COVANI U
THE CLINICAL OUTCOMES OF IMMEDIATE VERSUS DELAYED RESTORATION PROCEDURES ON IMMEDIATE IMPLANTS: A COMPARATIVE COHORT STUDY FOR SINGLE-TOOTH REPLACEMENT
CLIN IMPLANT DENT RELAT RES, 2014 MAY 22 EPUB AHEAD OF PRINT

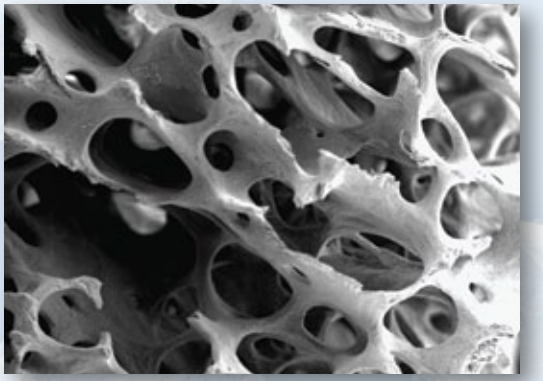
(8) BARONE A, TOTI P, QUARANTA A, ALFONSI F, CUCCHI A, CALVO GUIRADO JL, NEGRI B, DI FELICE R, COVANI U
VOLUMETRIC ANALYSIS OF REMODELLING PATTERN AFTER RIDGE PRESERVATION COMPARING USE OF TWO TYPES OF XENOGRAFTS. A MULTICENTRE RANDOMIZED CLINICAL TRIAL
CLIN ORAL IMPLANTS RES, 2015 FEB 26 EPUB AHEAD OF PRINT

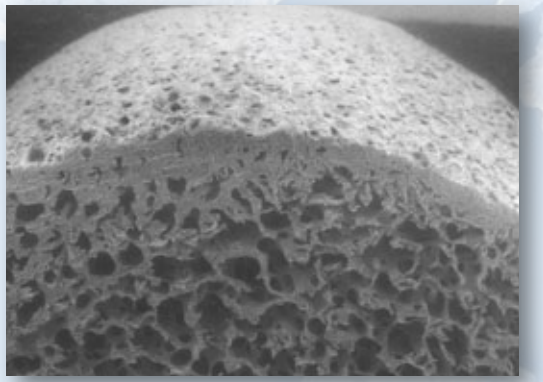
(9) SCARANO A, PIATTELLI A, ASSENZA B, QUARANTA A, PERROTTI V, PIATTELLI M, IEZZI G
PORCINE BONE USED IN SINUS AUGMENTATION PROCEDURES: A 5-YEAR RETROSPECTIVE CLINICAL EVALUATION
J ORAL MAXILLOFAC SURG, 2010 AUG; 68(8):1869-73

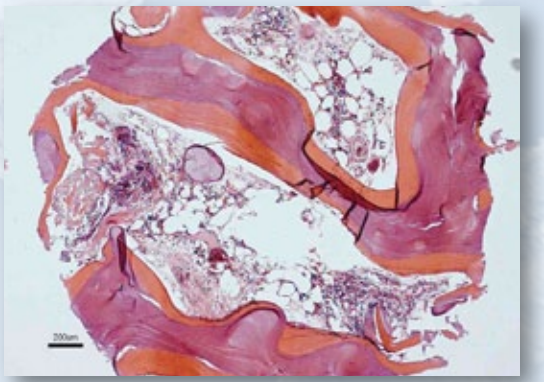
For further information see the complete literature on p. 110

BLOCKS





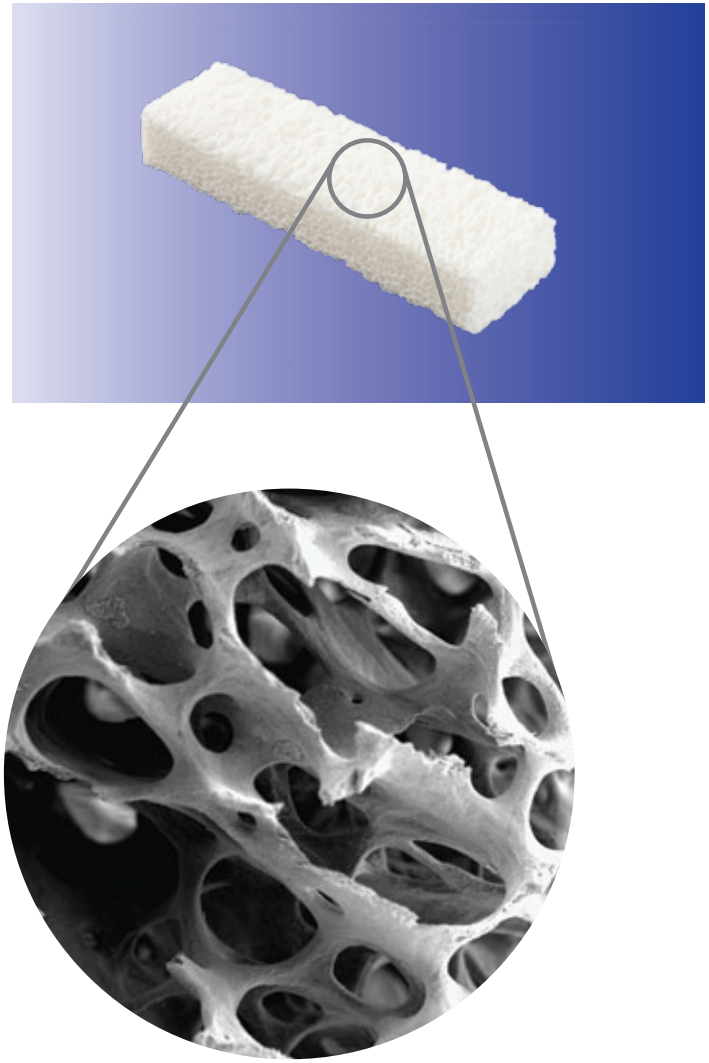





OsteoBiol® bone blocks

Sp-Block

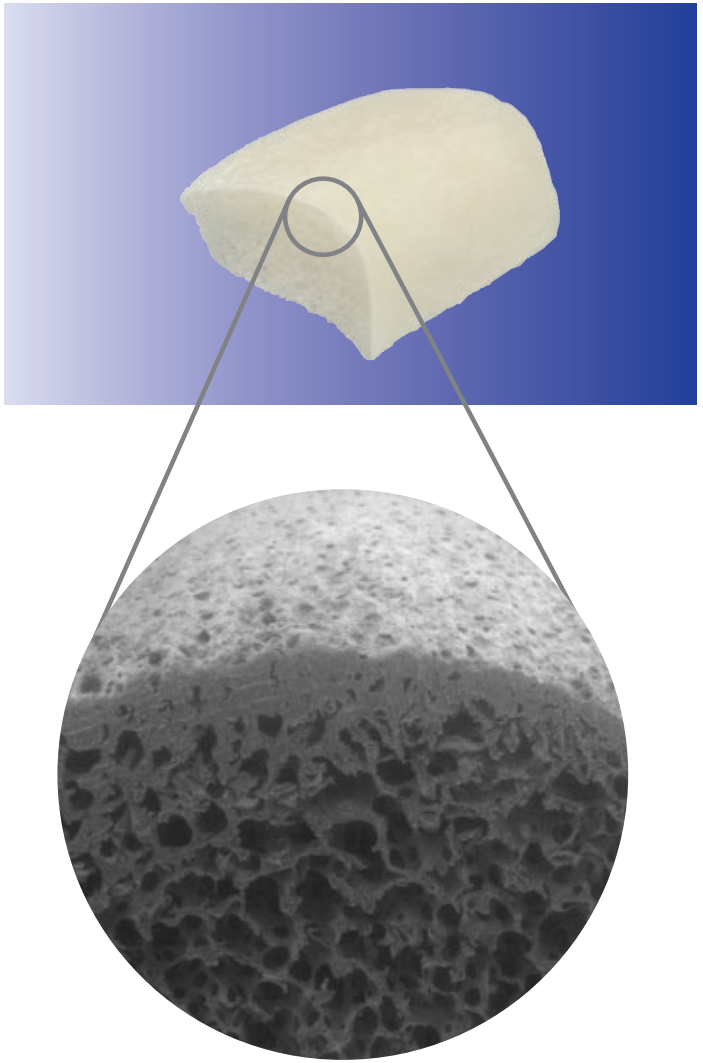
collagenated cancellous bone



SEM image of OsteoBiol® *Sp-Block*. Magnification 25x.
Source: Courtesy of Prof Dr José L Calvo Guirado, Murcia, Spain
For more information on OsteoBiol® *Sp-Block* see page 48

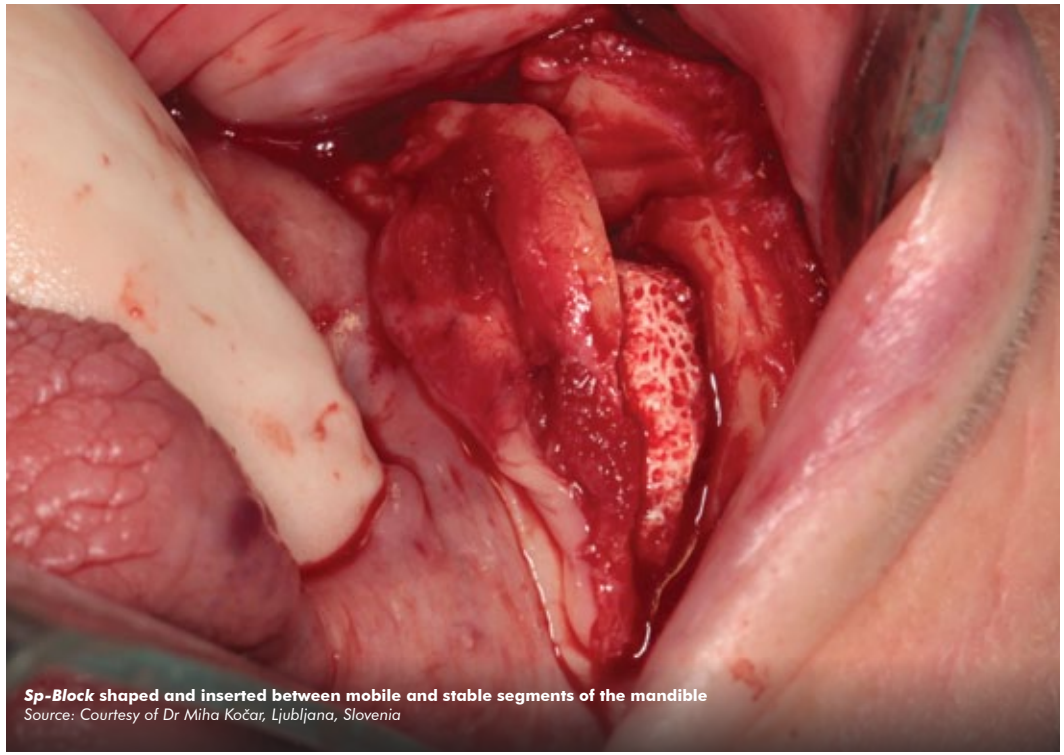
Dual-Block

collagenated cortico-cancellous bone

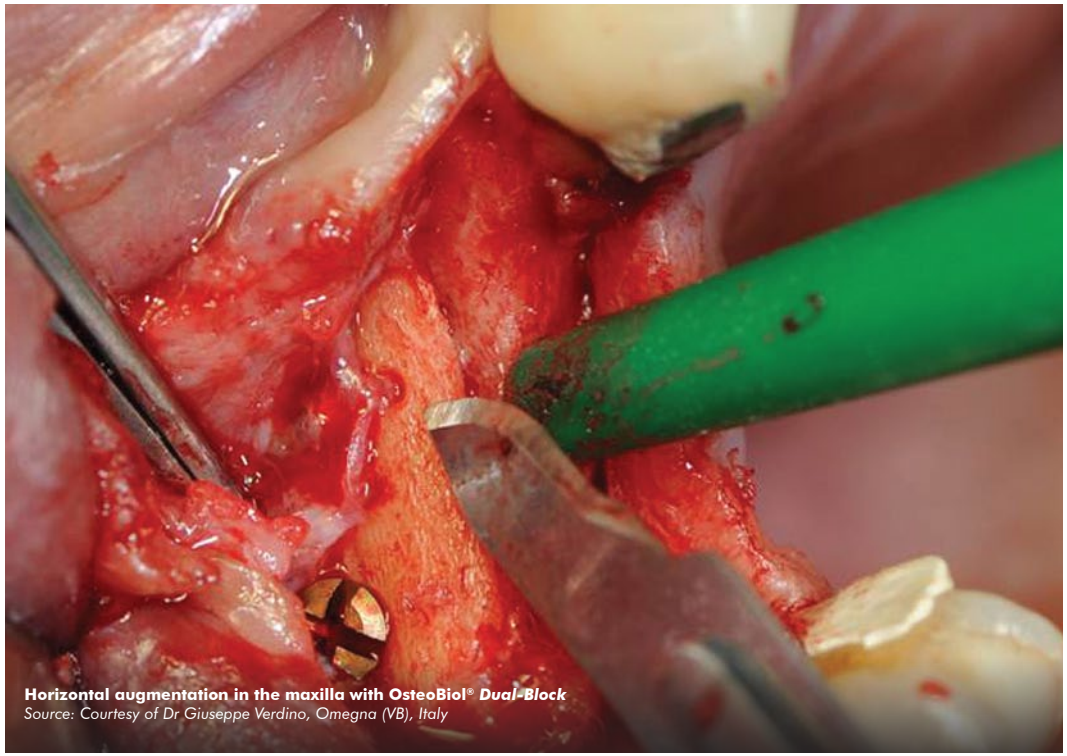


SEM image of OsteoBiol® *Dual-Block*. Magnification 20x.
Source: Politecnico di Torino, Italy
For more information on OsteoBiol® *Dual-Block* see page 48

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 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

CHARACTERISTICS

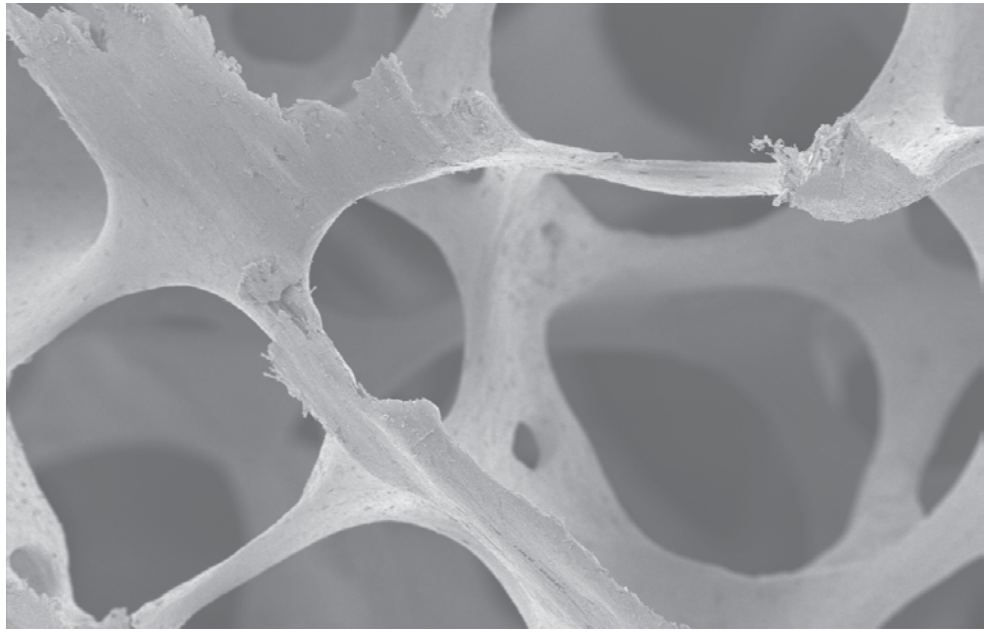
Sp-Block is a cancellous block of xenogenic bone produced with an exclusive Tecnoss® process which avoids ceramization of the hydroxyapatite crystals, thus accelerating physiological resorption. *Sp-Block* supports new bone formation[1,2]: thanks to its rigid consistency it is able to maintain the original 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[3,4,5], 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 and to stabilize the augmented area with mini-plates and screws.



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

BIBLIOGRAPHY

(1) 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

(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;33(2):159-66

(3) 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;5(1):19-33

(4) 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

(5) 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;6(4):343-357

VERTICAL AUGMENTATION
inlay technique
case reports on page 86

Additional case reports on osteobiol.com

Characteristics, handling and clinical indications

free animated videos on OsteoBiol® APP

CHARACTERISTICS

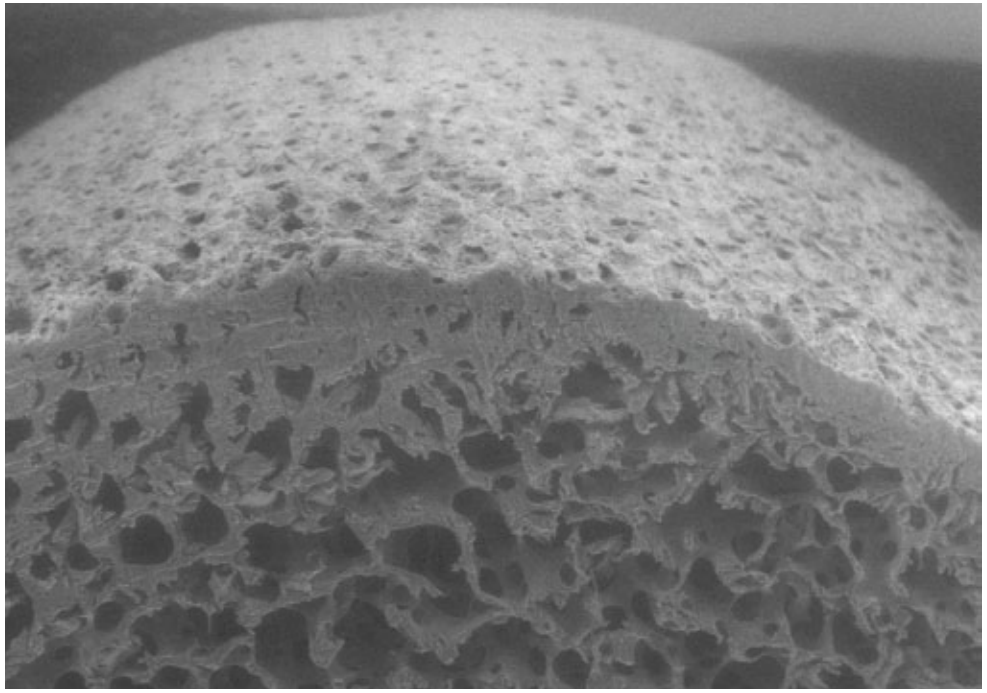
Dual-Block is a cortico-cancellous block of xenogenic bone with osteoconductive characteristics. It can be used when the regeneration of big volumes is needed: thanks to the collagen content that promotes blood clotting and migration of regenerative and repairing cells[1], the graft offers an adeguate 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 be always 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 83

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 patient

Packaging
Sterile blister

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

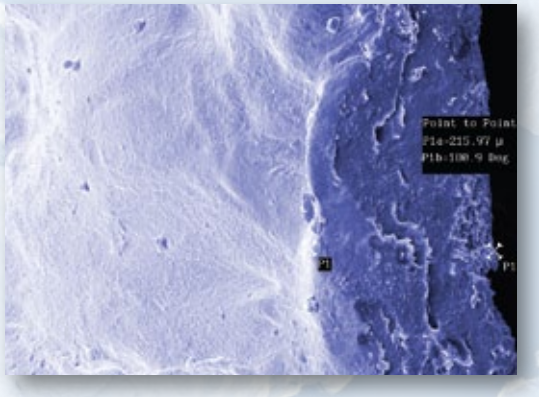
GMDN code
38746

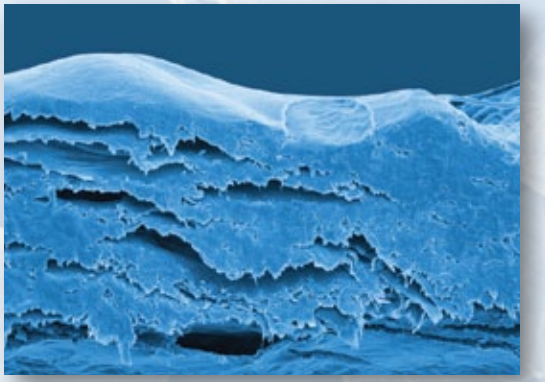
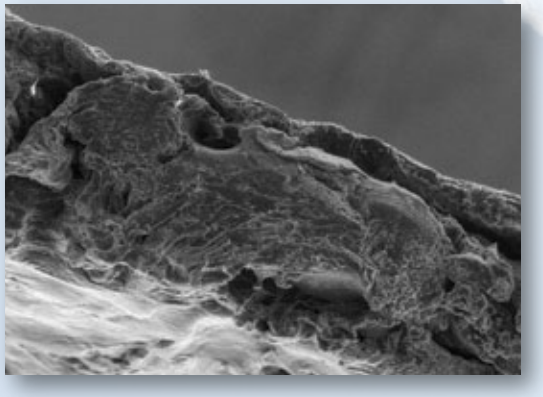
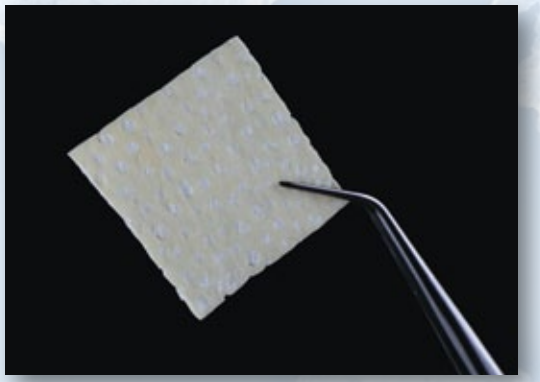
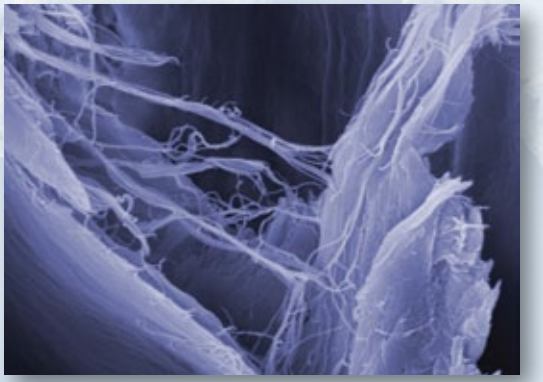
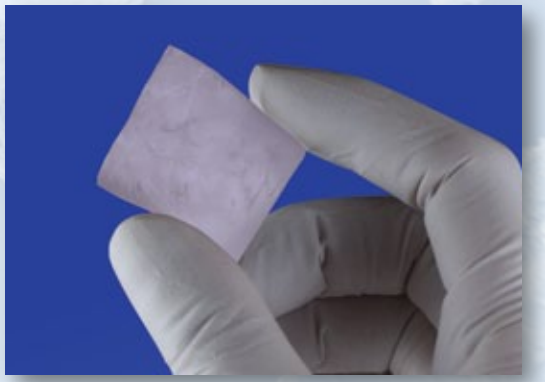
BIBLIOGRAPHY

(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, 2015 JUN 11 EPUB AHEAD OF PRINT

Additional case reports on osteobiol.com

MEMBRANES AND BARRIERS

OsteoBiol® membranes and barriers

MEMBRANES

Evolution

Heterologous mesenchymal tissue

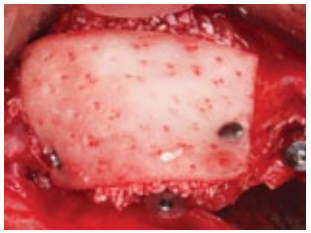
Dried membrane with one smooth side and one micro-rough side

Intrabony defect graft protected by OsteoBiol® *Evolution*
Source: Courtesy of Dr Roberto Abundo and Dr Giuseppe Corrente, Torino, Italy
For more information on OsteoBiol® *Evolution* see page 54

Derma

Porcine derma

Dried membrane



OsteoBiol® *Derma* grafted on lateral sinus wall
Source: Courtesy of Prof Antonio J. Murillo Rodriguez, Eibar, Spain
For more information on OsteoBiol® *Derma* see page 58

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 66

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 66

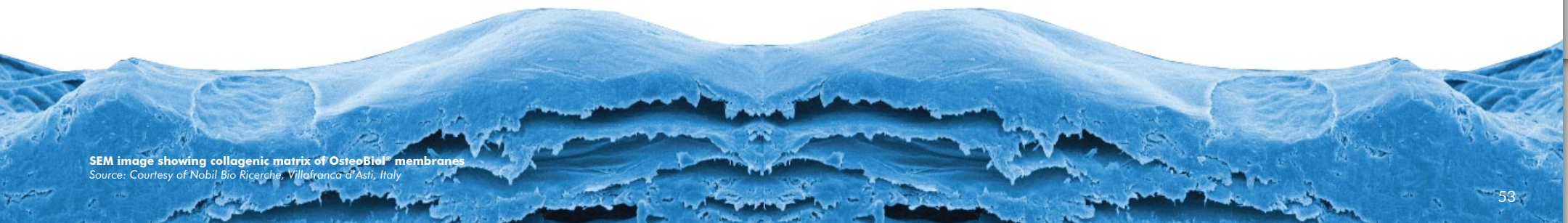
BARRIERS

Lamina

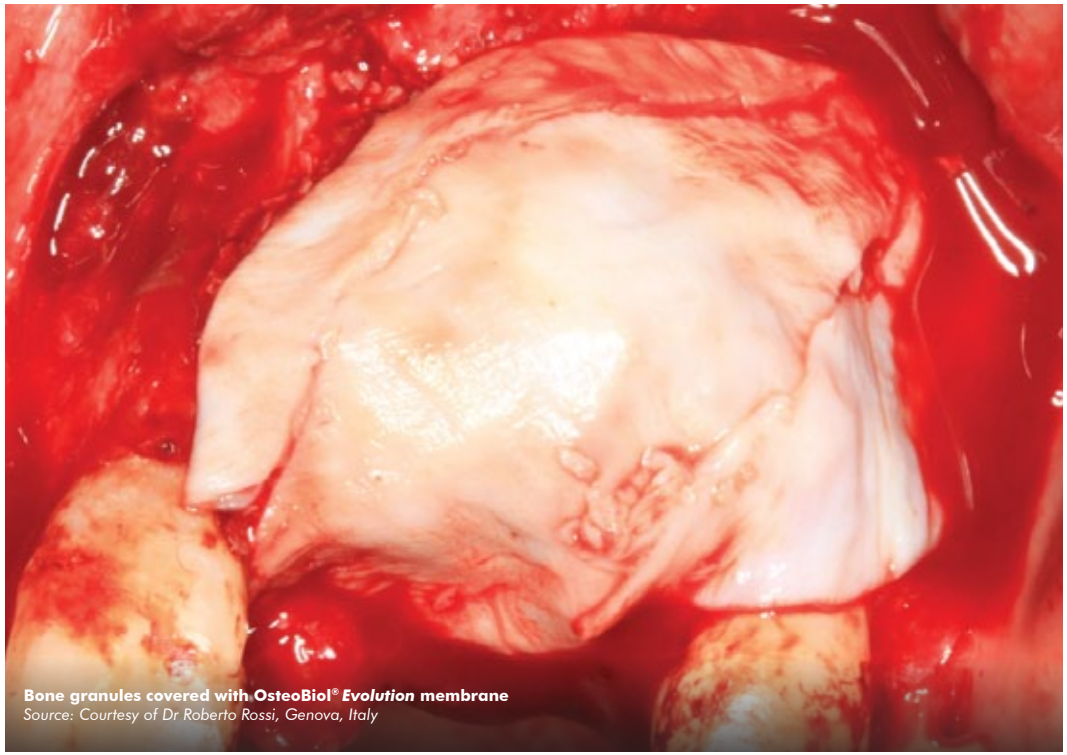
Cortical bone

Semi-rigid dried lamina, flexible after re-hydration

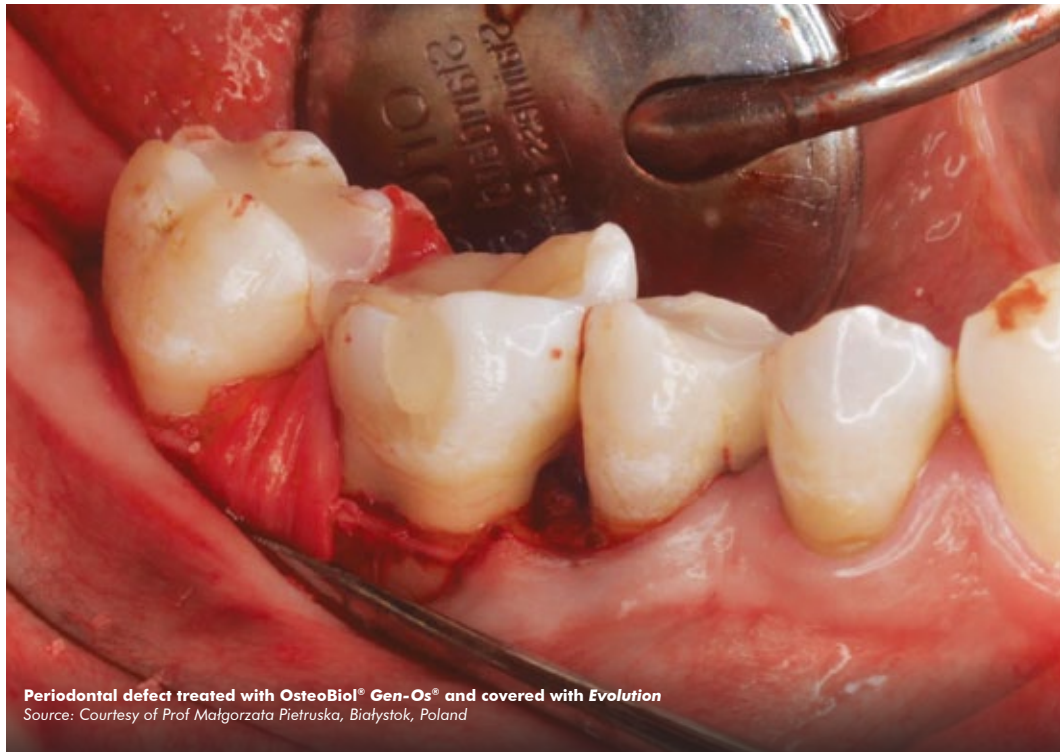
OsteoBiol® *Lamina* for the covering of a horizontally augmented area
Source: Courtesy of Prof Dr Hannes Wachtel and Dr Tobias Thalmair, Munich, Germany
For more information on OsteoBiol® *Lamina* see page 62



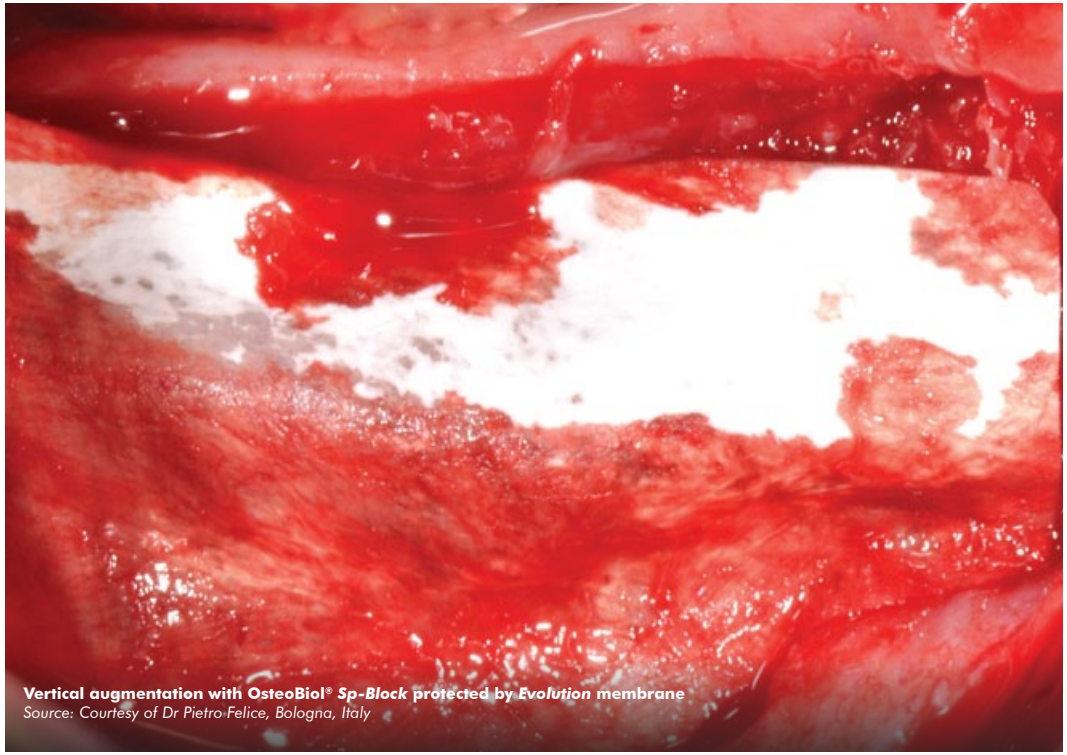
SEM image showing collagenic matrix of OsteoBiol® membranes
Source: Courtesy of Nobil Bio Ricerche, Villafranca d'Asti, Italy



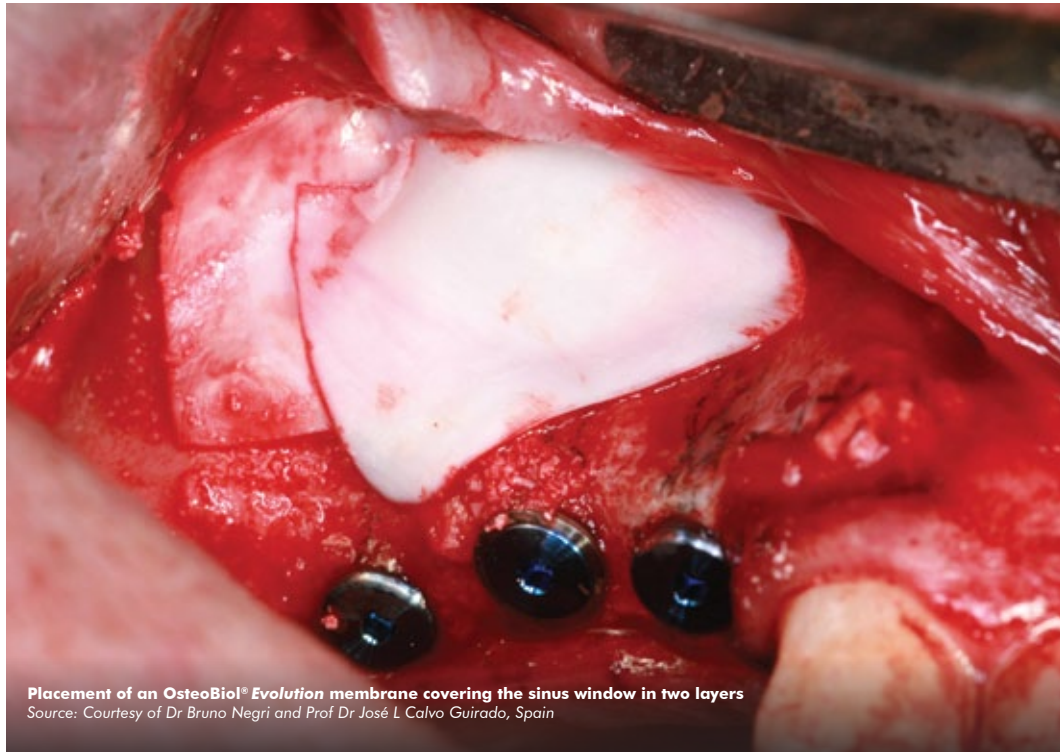
Bone granules covered with OsteoBiol® *Evolution* membrane
Source: Courtesy of Dr Roberto Rossi, Genova, Italy



Periodontal defect treated with OsteoBiol® *Gen-Os*® and covered with *Evolution*
Source: Courtesy of Prof Małgorzata Pietruska, Białystok, Poland



Vertical augmentation with OsteoBiol® *Sp-Block* protected by *Evolution* membrane
Source: Courtesy of Dr Pietro Felice, Bologna, Italy



Placement of an OsteoBiol® *Evolution* membrane covering the sinus window in two layers
Source: Courtesy of Dr Bruno Negri and Prof Dr José L Calvo Guirado, Spain

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
Fine: 0.3 mm (±0.1 mm)
Standard: 0.5 mm (±0.1 mm)

Estimated resorption time
Fine: about 3 months
Standard: about 4 months

Packaging
20x20 mm, 30x30 mm, 25x35 mm (oval)

Product codes
EV02LLE | 20x20 mm | Fine | Equine
EV02HHE | 20x20 mm | Standard | Equine
EM02HS| 20x20 mm | Standard | Porcine
EV03LLE | 30x30 mm | Fine | Equine
EV03HHE | 30x30 mm | Standard | Equine
EM03HS | 30x30 mm | Standard | Porcine
EVOLLE | 25x35 mm (oval) | Fine | Equine
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

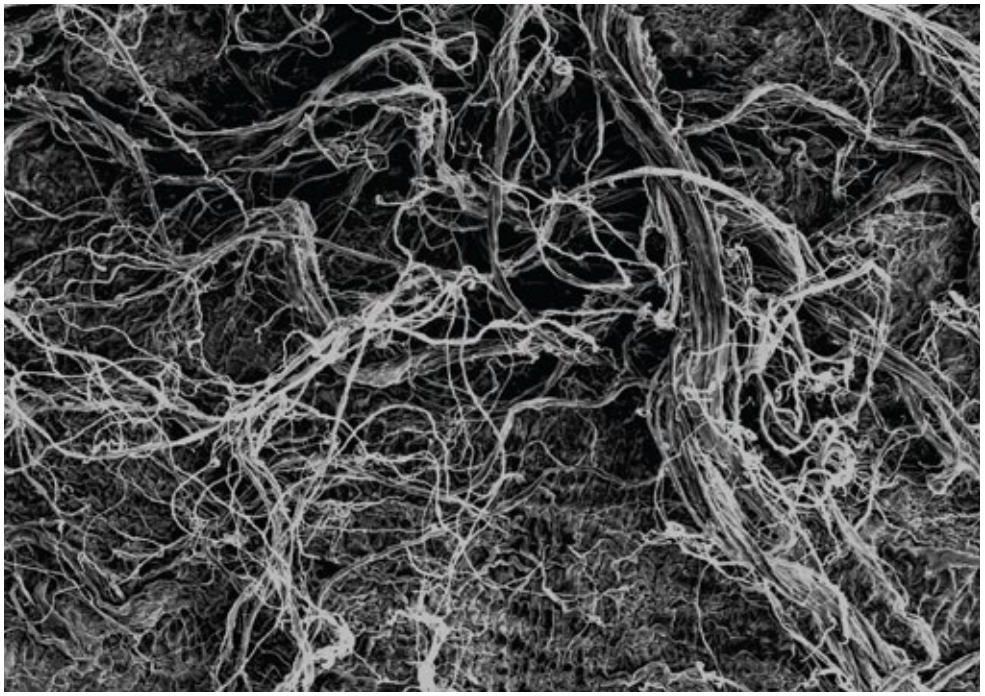
• best membrane-bone and membrane-periosteum interface

• stability and prolonged protection of the underlying graft[1]

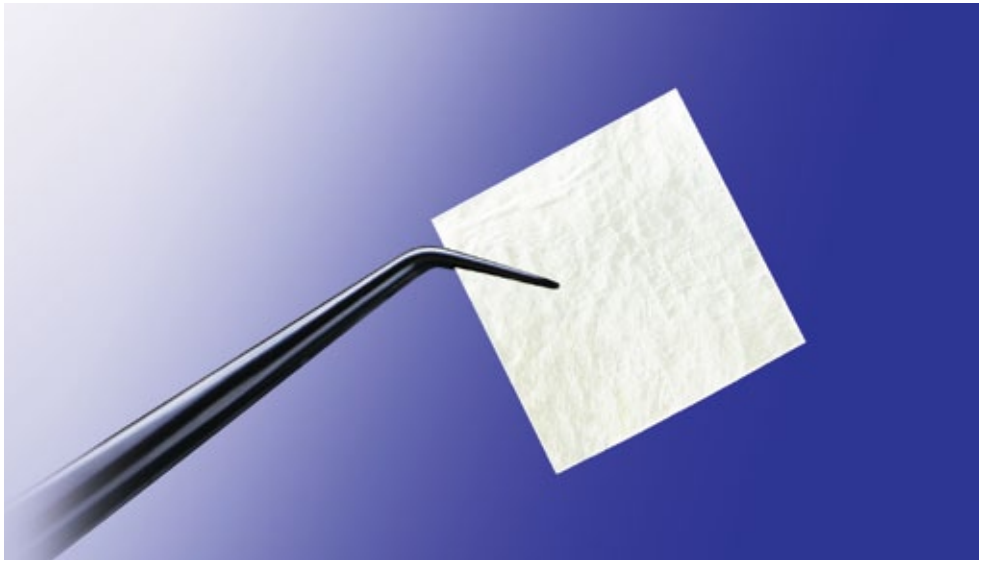
HANDLING

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[3,4,5].



SEM image of the rough side of an OsteoBiol® *Evolution* membrane
Source: Courtesy of Prof Dr José L Calvo Guirado, Murcia, Spain



Source: Tecnoss® Dental Media Library

Clinical Indications

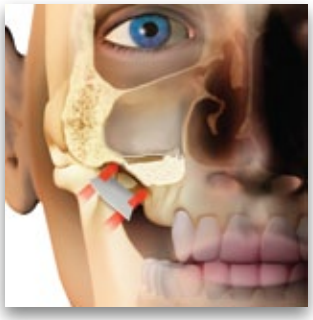
free animated videos
on OsteoBiol® APP

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. The dense collagenic matrix of *Evolution* protects the graft from infection in case of accidental exposure: the membrane itself will also not be infected, allowing second intention healing[3,4].

This property is particularly important in case of flapless regeneration 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)[6,7,8] and to protect the sinus membrane from cutting risk due to graft pressure (fine model or OsteoBiol® *Special*)[9].

Evolution is also ideal to protect peri-implant regenerations[10] and periodontal grafts. Furthermore, *Evolution* fine has been successfully used in combination with OsteoBiol® *Gel 40* for the treatment of gingival recessions[2] and to protect *Sp-Block* in vertical augmentation with inlay technique[11].

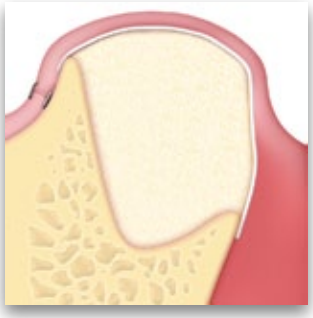


LATERAL ACCESS SINUS LIFT
maxillary sinus floor augmentation
case reports on page 80

DEHISCENCES AND FENESTRATIONS
peri-implant lesions
case reports on page 76

PERIODONTAL REGENERATION
intrabony defects
case reports on page 88

ALVEOLAR REGENERATION
graft protection
case reports on page 73



HORIZONTAL AUGMENTATION
two-wall defects
case reports on page 83

VERTICAL AUGMENTATION
inlay technique
case reports on page 86

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) 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

(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, 2014 MAR 1 EPUB AHEAD OF PRINT

(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, 2012 JUL 12, EPUB AHEAD OF PRINT

(5) 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

(6) 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, 2012 JAN 26, EPUB AHEAD OF PRINT

(7) 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. EPUB 2011 DEC 12

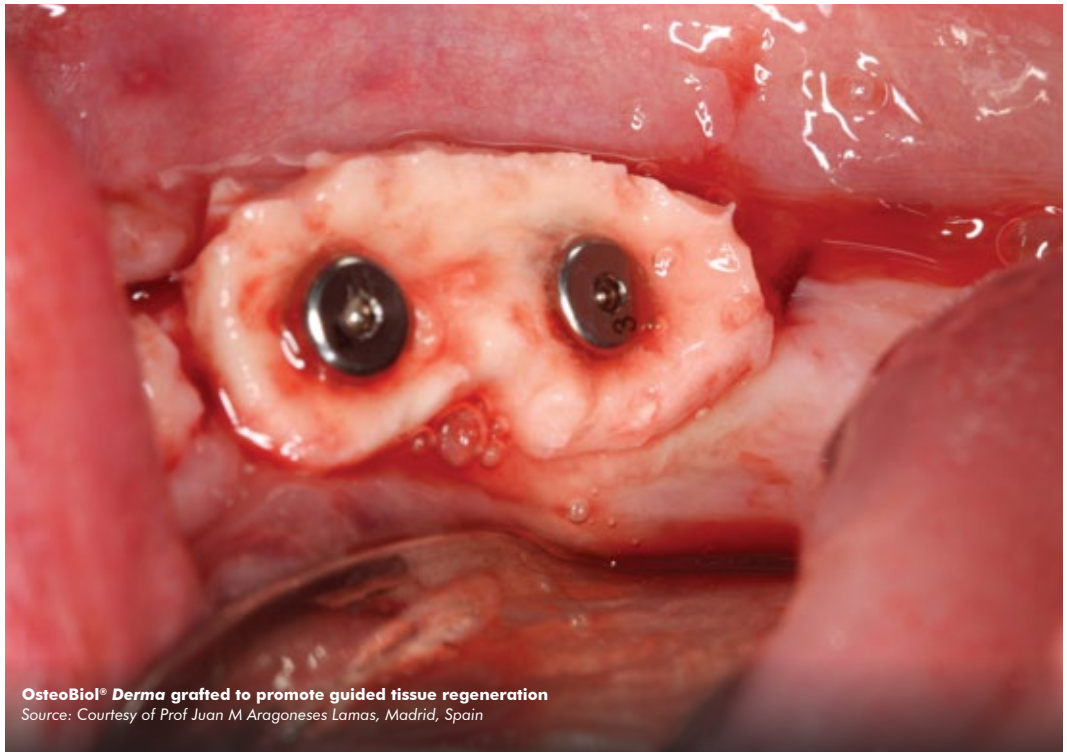
(8) SCARANO A, PIATTELLI A, PERROTTI V, MANZON L, IEZZI G
MAXILLARY SINUS AUGMENTATION IN HUMANS USING CORTICAL PORCINE BONE: A HISTOLOGICAL AND HISTOMORPHOMETRICAL EVALUATION AFTER 4 AND 6 MONTHS
CLIN IMPLANT DENT RELAT RES, 2011 MAR; 13(1):13-18

(9) 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

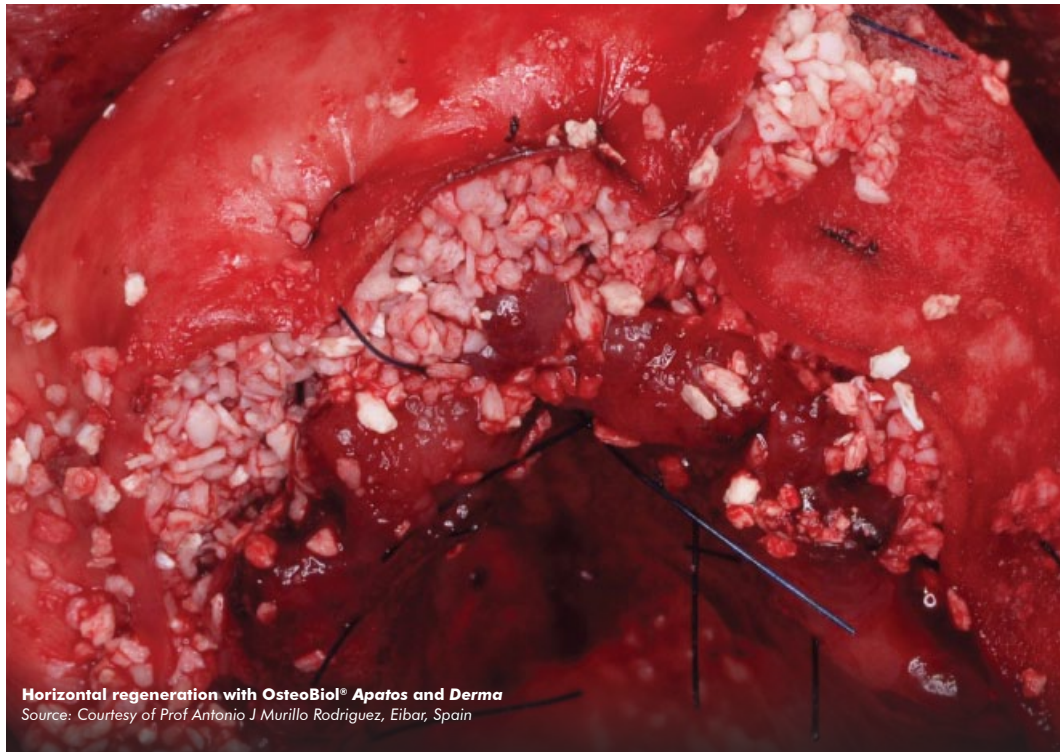
(10) COVANI U, MARCONCINI S, CRESPI R, BARONE A
IMMEDIATE IMPLANT PLACEMENT AFTER REMOVAL OF A FAILED IMPLANT: A CLINICAL AND HISTOLOGICAL CASE REPORT
J ORAL IMPLANTOL, 2009; 35(4):189-95

(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

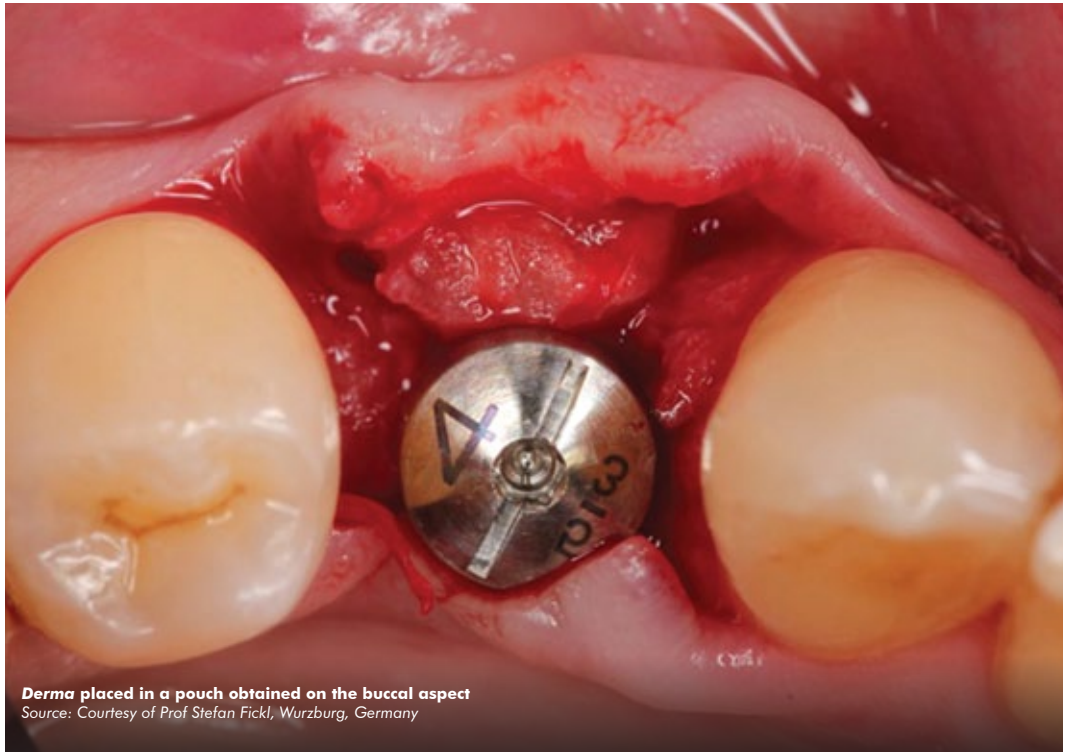
For further information see the complete literature on p. 106



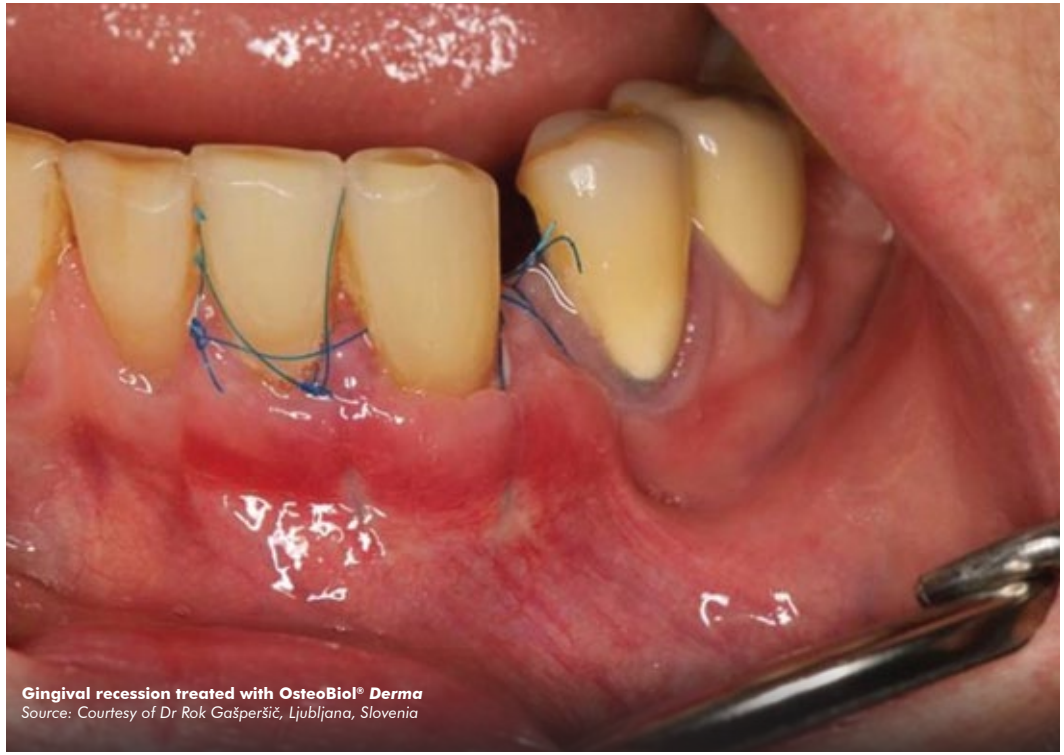
OsteoBiol® *Derma* grafted to promote guided tissue regeneration
Source: Courtesy of Prof Juan M Aragoneses Lamas, Madrid, Spain



Horizontal regeneration with OsteoBiol® *Apatos* and *Derma*
Source: Courtesy of Prof Antonio J Murillo Rodriguez, Eibar, Spain



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



Gingival recession treated with OsteoBiol® *Derma*
Source: Courtesy of Dr Rok Gašperšič, Ljubljana, Slovenia

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
Fine: 0.9 mm (±0.1 mm)
Standard: 2.0 mm (±0.2 mm)

Estimated resorption time
Fine: about 3 months
Standard: about 4 months

Packaging
Fine: 25x25 mm
Standard: 7x5 mm, 15x5 mm, 30x30 mm

Product codes
ED21FS | 12x8 mm | Fine | Porcine
ED25FS | 25x25 mm | Fine | Porcine
ED03SS | 30x30 mm | Standard | Porcine
ED75SS | 7x5 mm | Standard | Porcine
ED15SS | 15x5 mm | Standard | Porcine

GMDN code
38746

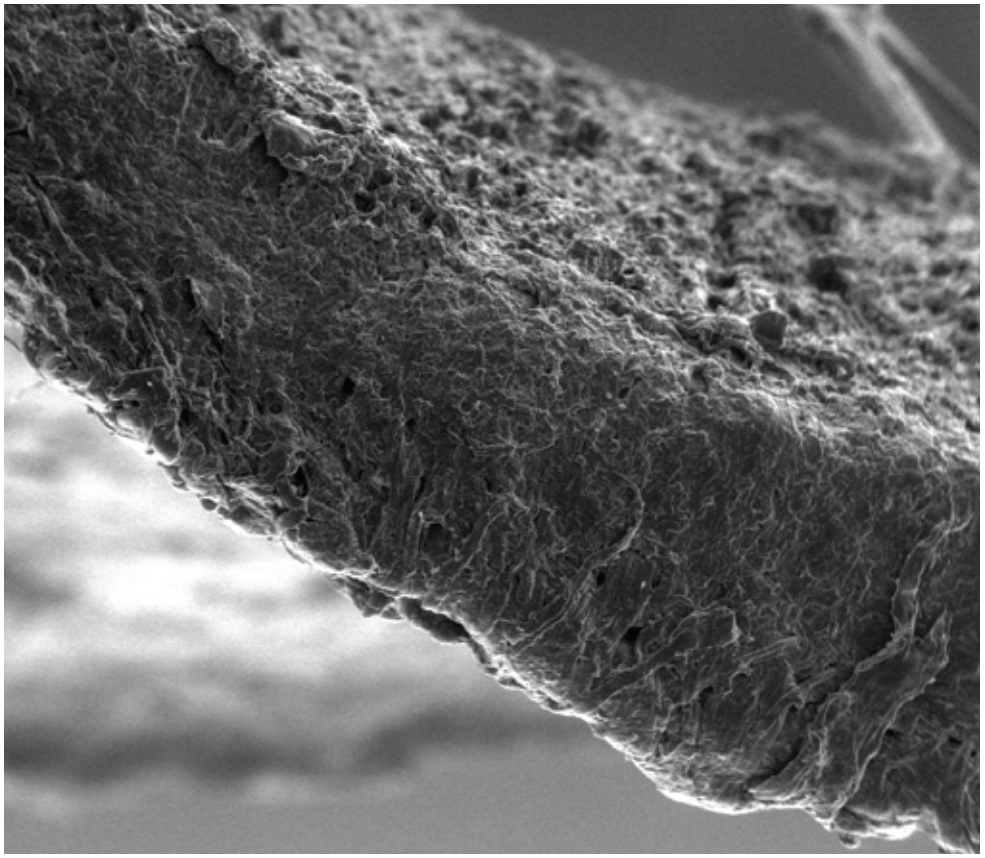
Characteristics and handling

CHARACTERISTICS

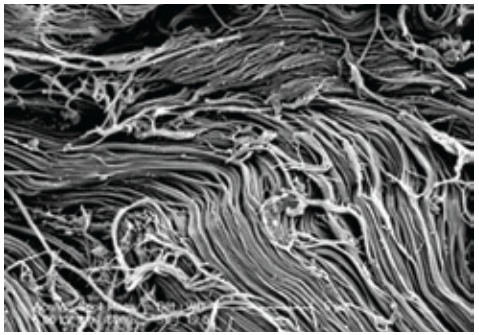
Obtained from derma of porcine origin, using an exclusive Tecnoss® process, *Derma* membranes are gradually integrated with the autologous soft tissues[1]. Their strong consistency and resistance allow a perfect stabilization and a prolonged protection of underlying graft in large regeneration procedures,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

HANDLING

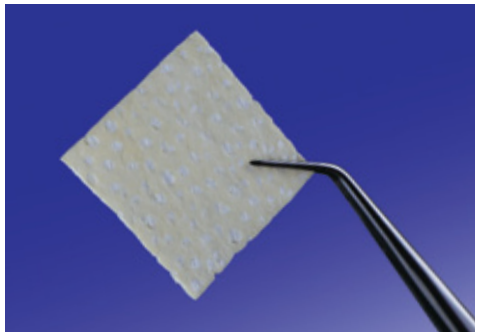
Derma membrane can be shaped with scissors until the desired size is reached; then it must be hydrated for 5 minutes in sterile lukewarm physiological solution. Once it acquires the desired plasticity, it must be adapted to the grafting site. It is always recommendable to prepare a pocket with an elevator 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, University of Witten/Herdecke, Germany



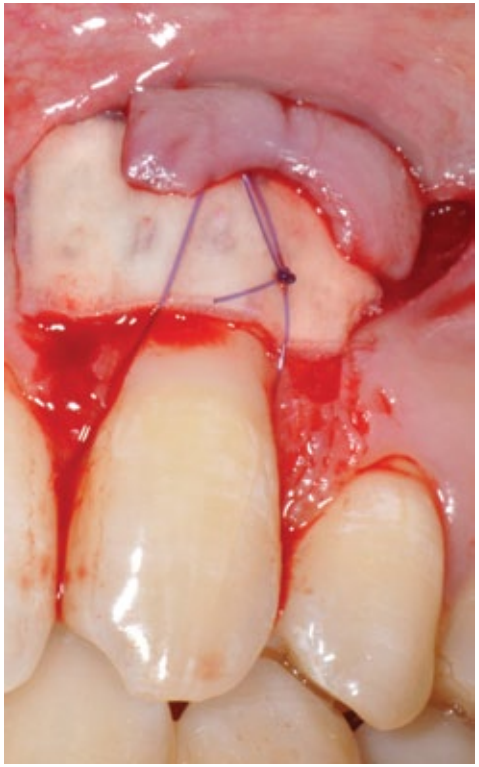
Source: Tecnoss® Dental Media Library

Clinical Indications

Derma membrane is a collagen resorbable barrier to protect and stabilize bone grafting materials; only in this specific indication it can be used also in open healing 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 to improve the quality of keratinized tissues[2].

Mild gingival recessions[3] 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.



***Derma* grafted to treat gingival recession and healing after 1 year**
Source: Courtesy of Dr Magda Mensi, Brescia, Italy

SOFT TISSUE AUGMENTATION
soft tissue improvement
case reports on page 90

PERIODONTAL REGENERATION
gingival recessions
case reports on page 88

ALVEOLAR REGENERATION
graft protection
case reports on page 73

Additional case reports on osteobiol.com

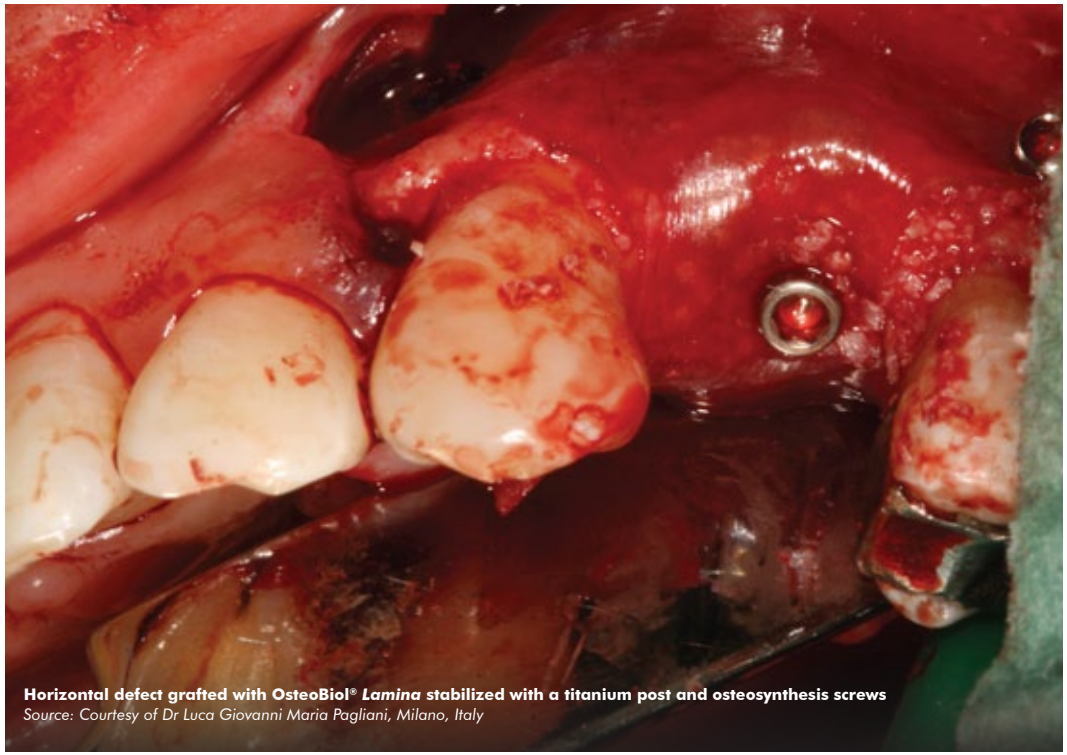
BIBLIOGRAPHY

(1) 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, 2014 FEB 19 EPUB AHEAD OF PRINT

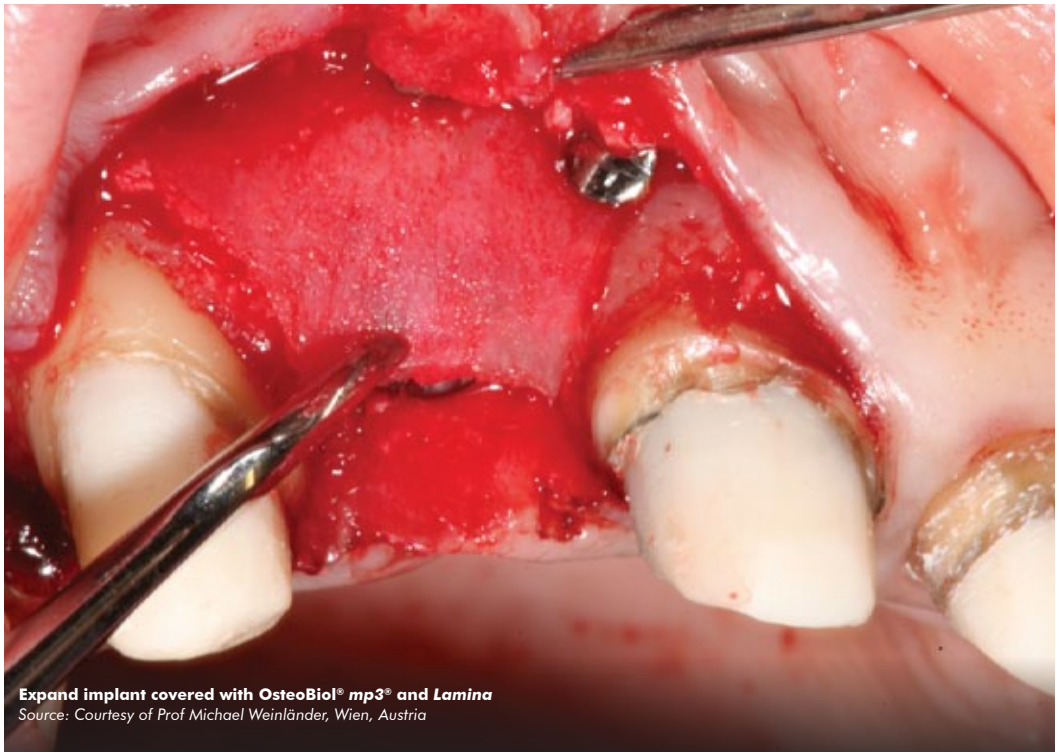
(2) FISCHER KR, FICKL S, MARDAS N, BOZEC L, DONOS N
STAGE-TWO SURGERY USING COLLAGEN SOFT TISSUE GRAFTS: CLINICAL CASES AND ULTRASTRUCTURAL ANALYSIS
QUINTESSENCE INT, 2014 AUG 6 EPUB AHEAD OF PRINT

(3) 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

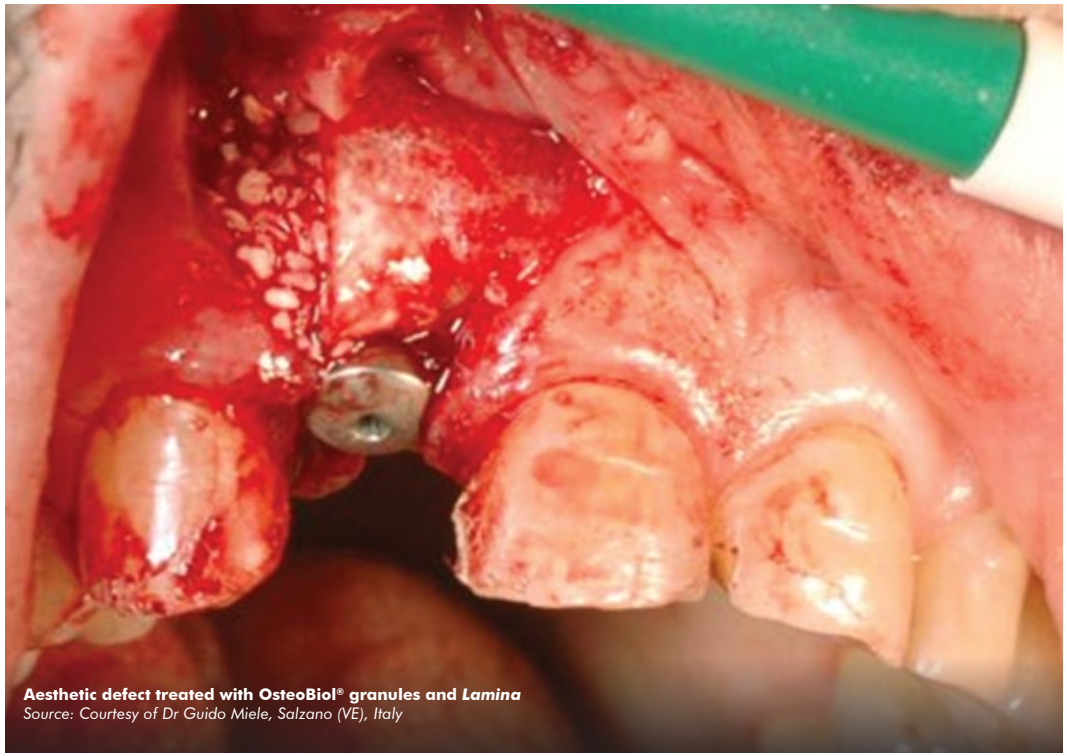
For further information see the complete literature on p. 110



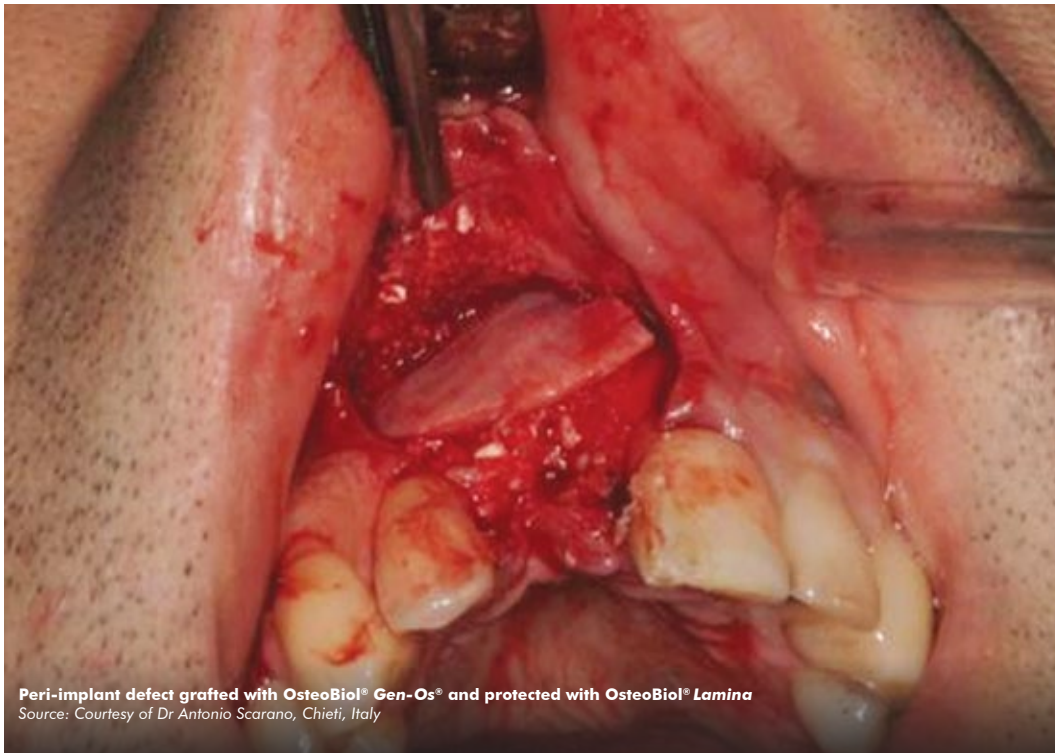
Horizontal defect grafted with OsteoBiol® *Lamina* stabilized with a titanium post and osteosynthesis screws
Source: Courtesy of Dr Luca Giovanni Maria Pagliani, Milano, Italy



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



Aesthetic defect treated with OsteoBiol® granules and *Lamina*
Source: Courtesy of Dr Guido Miele, Salzano (VE), Italy



Peri-implant defect grafted with OsteoBiol® *Gen-Os*® and protected with OsteoBiol® *Lamina*
Source: Courtesy of Dr Antonio Scarano, Chieti, Italy

Lamina

A unique cortical bone barrier

Heterologous collagenated cortical bone

Tissue of origin
Cortical bone

Tissue collagen
Preserved

Physical form
Semi-rigid dried lamina, flexible after re-hydration

Composition
100% cortical bone

Thickness
Fine: 0.5 mm (±0.1 mm)
Medium Curved: 1.0 mm (±0.1 mm)
Standard: 3 mm (±1 mm)

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

Packaging
Fine: 25x25 mm, 25x35 mm (oval)
Medium Curved: 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 | Porcine
LS10HE | 35x35 mm | Curved | Equine
LS03SS | 30x30 mm | Standard | Porcine
LS24LS | 20x40 mm | Medium | Porcine

GMDN code
38746

Characteristics and handling

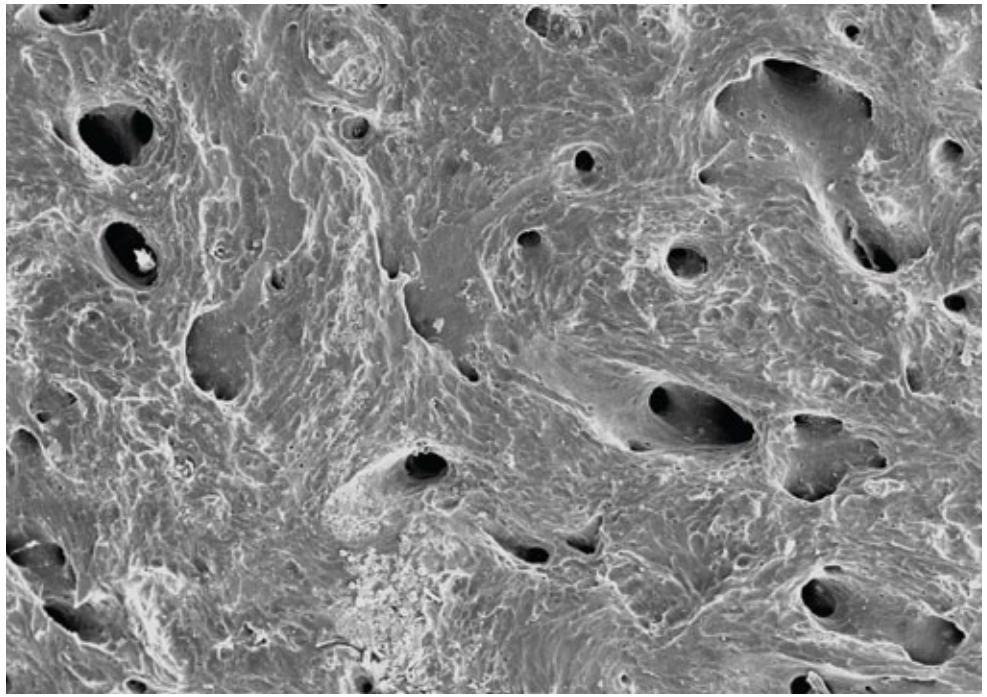
CHARACTERISTICS

OsteoBiol® *Lamina* is made of cortical bone of heterologous origin produced with an exclusive Tecnoss® process that avoids the ceramization of hydroxyapatite crystals, thus accelerating 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. OsteoBiol® *Curved Lamina* has a semi-rigid consistency and can be grafted without hydration, provided that it is previously shaped to fit the defect morphology.

HANDLING

OsteoBiol® *Lamina* can be shaped with sterile scissors until the desired size is reached, then it must be hydrated for 3/5 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.

OsteoBiol® *Curved Lamina* should not be hydrated 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: Courtesy of Prof José L Calvo Guirado, Murcia, Spain

Source: Tecnoss® Dental Media Library

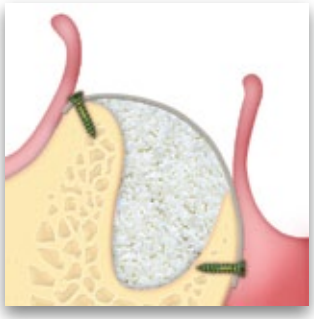
Clinical Indications

free animated videos
on OsteoBiol® APP

Cortical Laminas are made of cortical bone of heterologous origin which undergoes a process of superficial decalcification, nevertheless maintaining the typical consistency of the bone tissue from which it originates.

The fine model 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]. This property is particularly useful when it is necessary to obtain a space making effect in esthetic areas[3], as well as in horizontal augmentation[4] of two wall defects and antrostomy covering in lateral access sinus lift procedures[5,6,7]. *Lamina* can also be used in regenerations with risks of exposure and for orbital floor restoration[1,8,9]. The *Curved Lamina* has a 0.8-1.0 mm thickness and can be directly grafted without hydration: it is particularly indicated in association with OsteoBiol® *mp3*® for regeneration of ridges with compromised cortical plate.

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



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two-wall defects
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Additional case reports on osteobiol.com

BIBLIOGRAPHY

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

(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. EPUB 2010 OCT 26

(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 RELAT RES, 2011 NOV 14, EPUB AHEAD OF PRINT

(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) 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 OF OSSEOINTEGRATION, 2009

(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

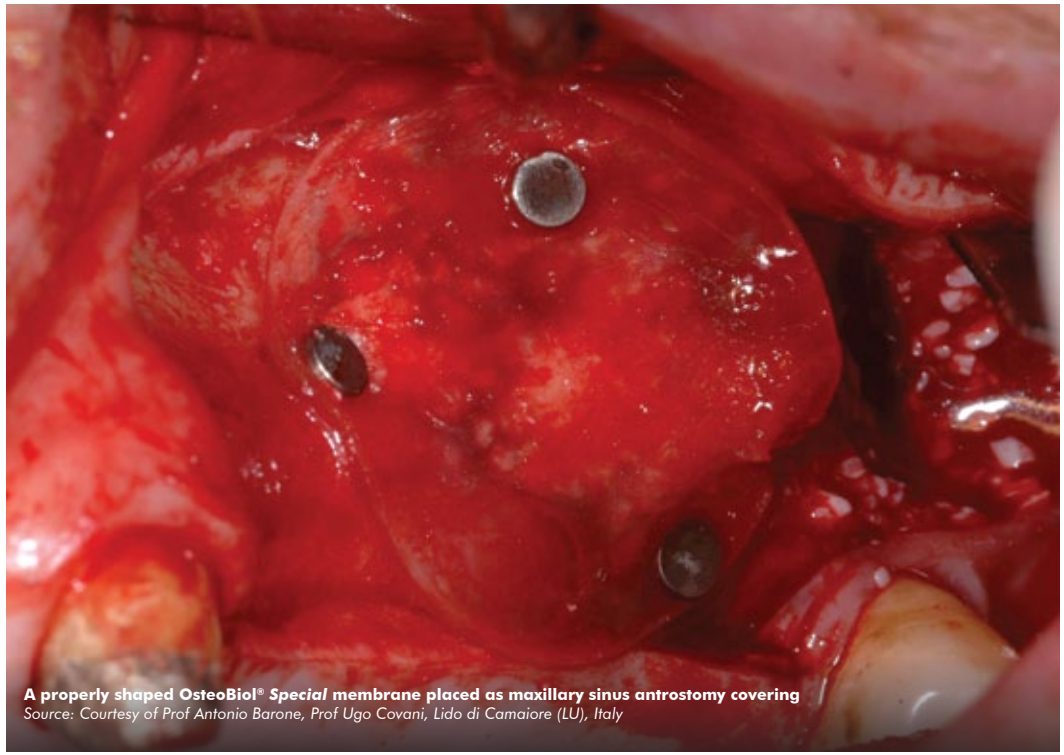
(7) SCARANO A, PIATTELLI A, IEZZI G, VARVARA G
SPONTANEOUS BONE FORMATION ON THE MAXILLARY SINUS FLOOR IN ASSOCIATION WITH SURGERY TO REMOVE A MIGRATED DENTAL IMPLANT: A CASE REPORT
MINERVA STOMATOL, 2014 OCT;63(10):351-9

(8) RINNA C, UNGARI C, SALTAREL A, CASSONI A, REALE G
ORBITAL FLOOR RESTORATION
J CRANIOFAC SURG, 2005, 16(6): 968-972

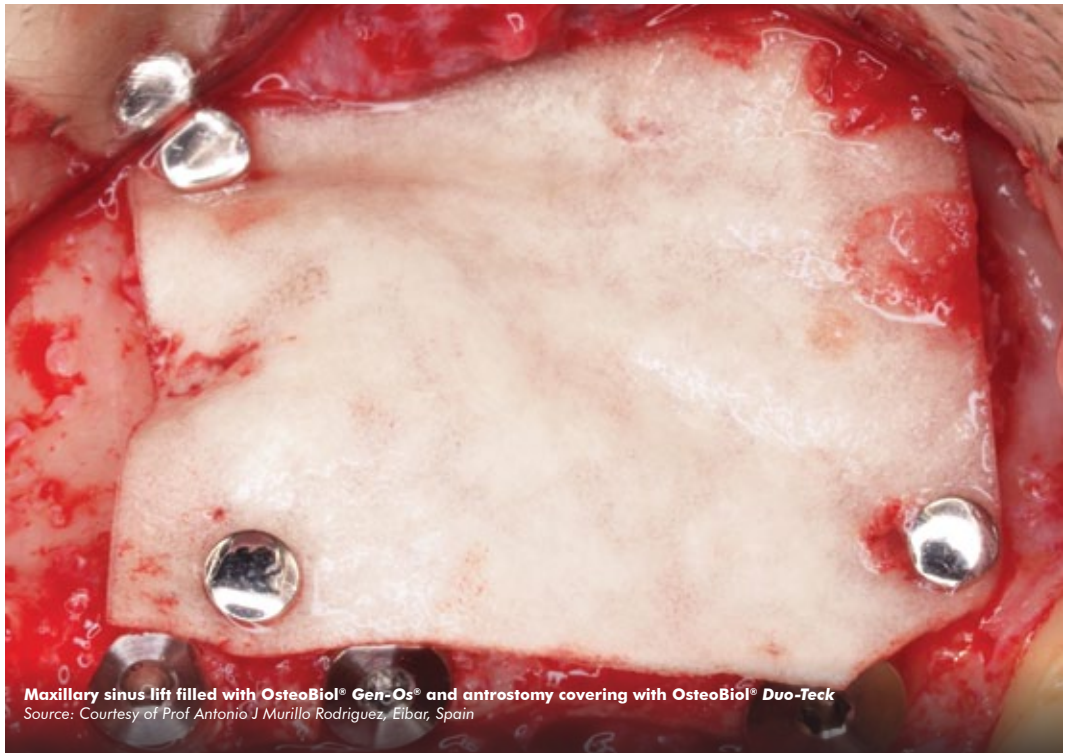
(9) OZEL B, FINDIKCIOGLU K, SEZGIN B, GUNEY K, BARUT I, OZMEN S
A NEW OPTION FOR THE RECONSTRUCTION OF ORBITAL FLOOR DEFECTS WITH HETEROLOGOUS CORTICAL BONE
J CRANIOMAXILLOFAC SURG, 2015 OCT;43(8):1583-8 EPUB 2015 JUL 4

For further information see the complete literature on p. 110

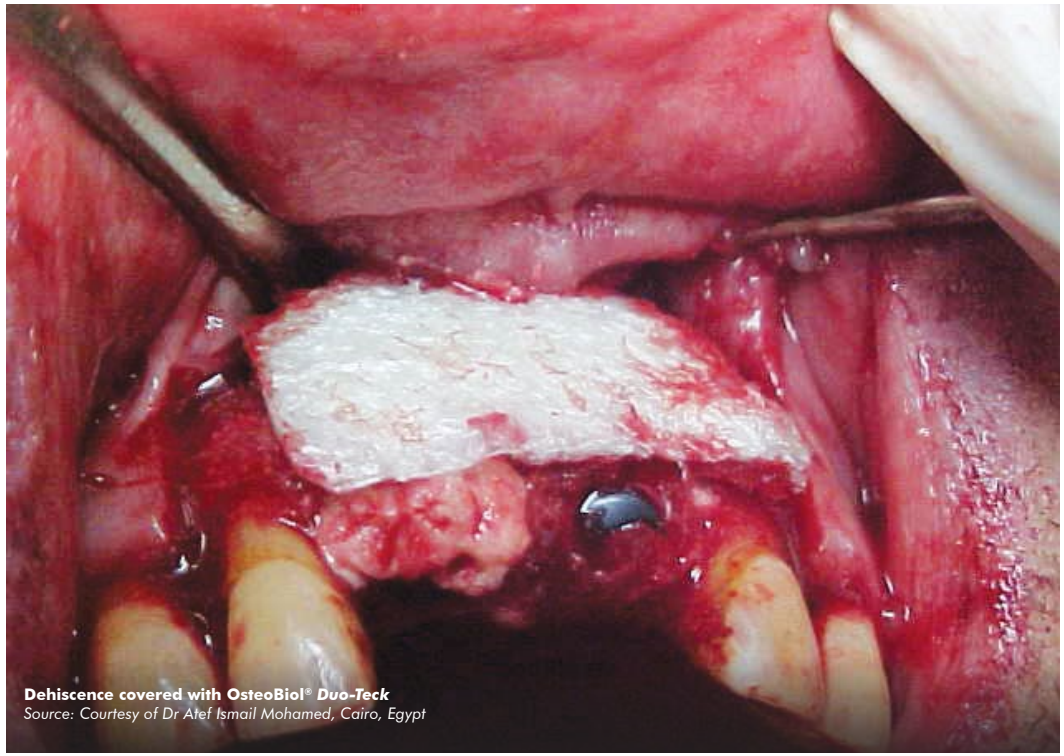
OsteoBiol® *Special* protecting the Schneider membrane before grafting
Source: Courtesy of Dr Donato Frattini, Legnano (MI), Italy



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



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

Granules-coated 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

Packaging
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.

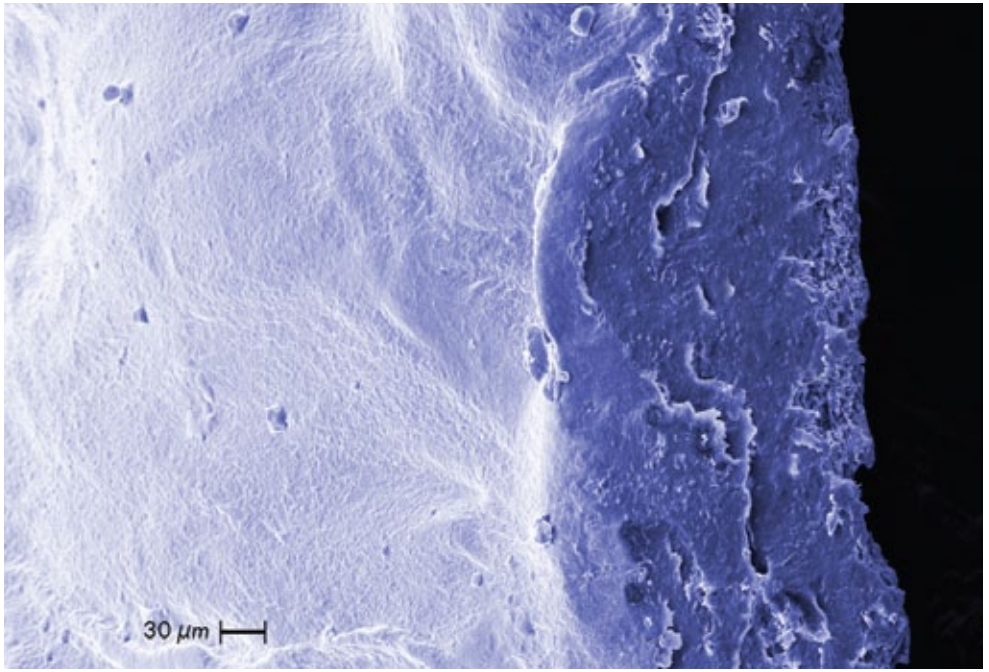
HANDLING

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 can be also 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 88

LATERAL ACCESS SINUS LIFT
Schneider membrane protection
case reports on page 80

Characteristics, handling and clinical indications

CHARACTERISTICS

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

It 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

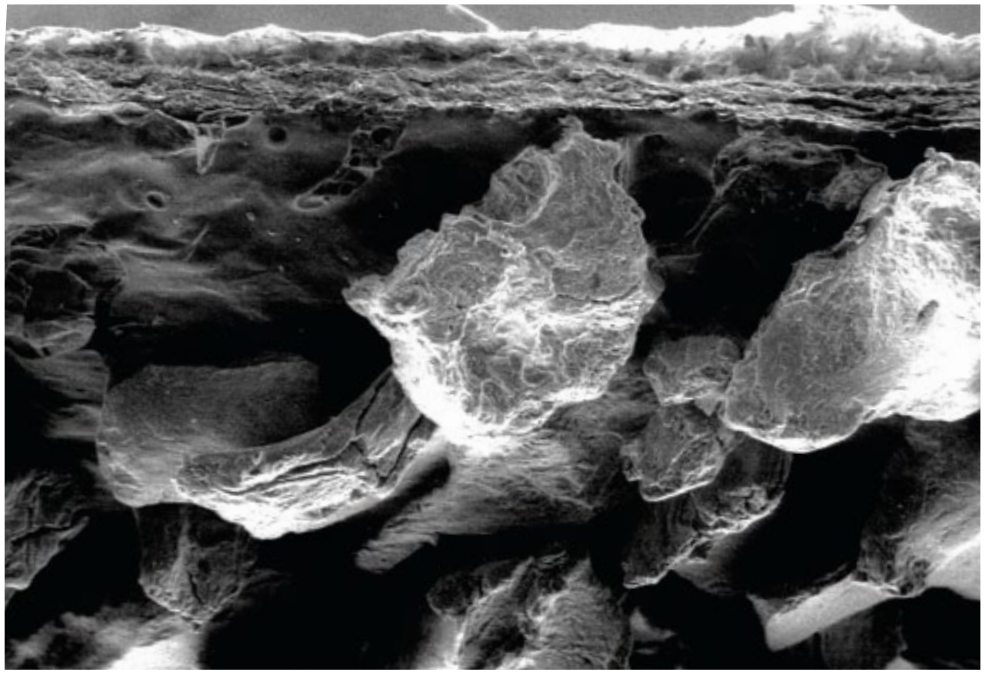
Duo-Teck can be easily placed directly in the grafting site with the micronized bone film side in contact with the graft and the smooth side in contact with the soft tissues.

CLINICAL INDICATIONS

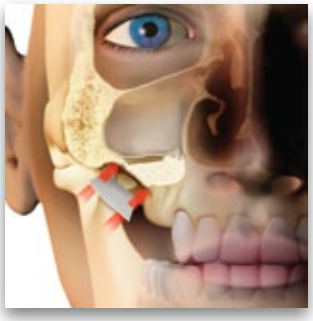
Duo-Teck is indicated in all those cases where a "soft" separation between tissues of different consistency is necessary. *Duo-Teck* can be used to protect the maxillary sinus membrane in sinus floor augmentation procedures[1], in order to avoid accidental lesions caused by grafting material. It can be also 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
JOURNAL OF ORAL IMPLANTOLOGY, 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
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DEHISCENCES AND FENESTRATIONS
peri-implant lesions
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Additional case reports on osteobiol.com

Tissue of origin
Equine lyophilised collagen felt and equine bone

Tissue collagen
Preserved

Physical form
Dried membrane covered with micronized bone

Composition
Collagen felt and bone granules

Granulometry
Up to 300 μm

Thickness
With granules coating: 0.2 mm (±0.1 mm)
Collagen felt only: 0.15 mm (±0.05 mm)

Estimated resorption time
About 15 days

Packaging
20x20 mm, 25x25 mm

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

GMDN code
38746

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 leads 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.

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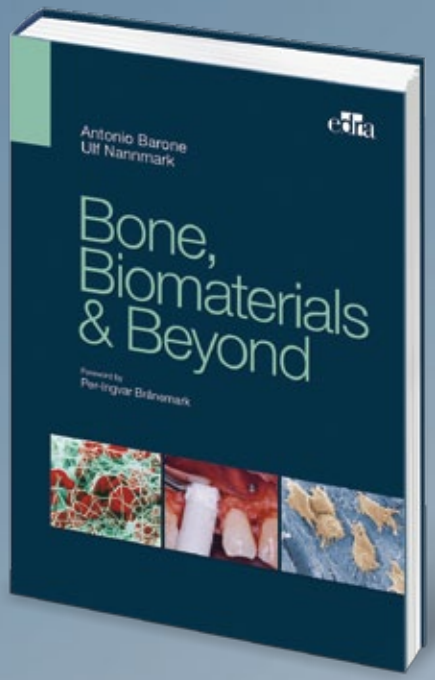

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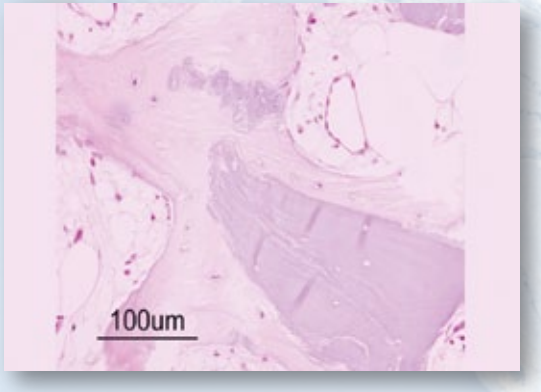
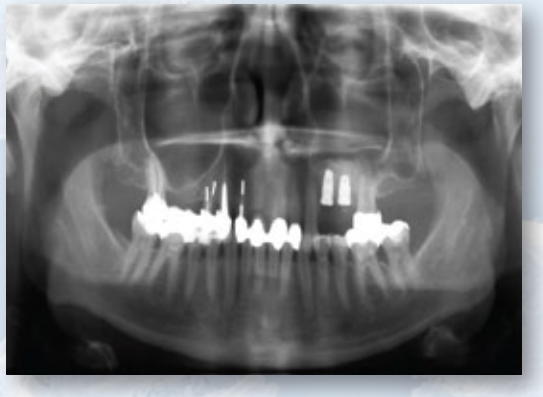
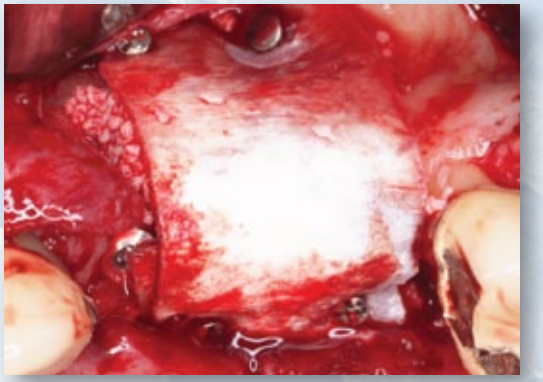
CLINICAL CASES







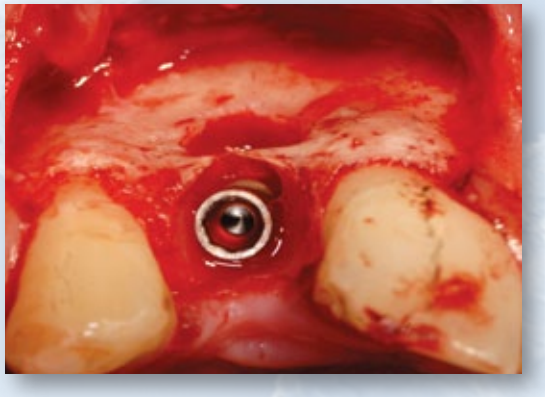



Fig. 1


Fig. 2

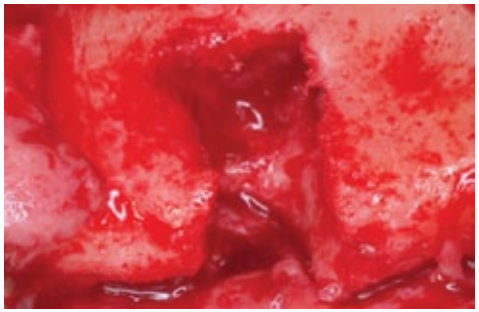


Fig. 3

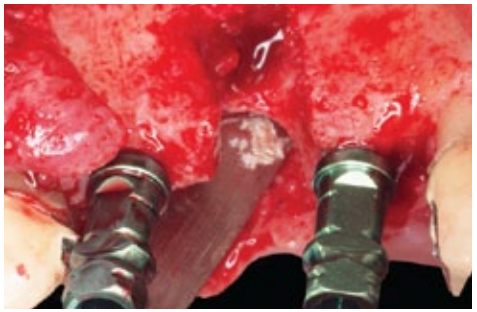


Fig. 4


Fig. 5

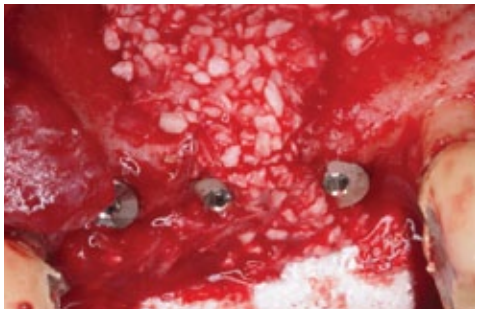


Fig. 6

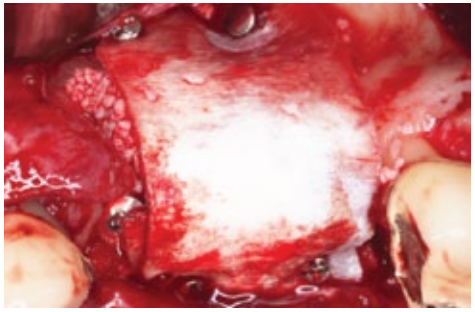


Fig. 7



Fig. 8

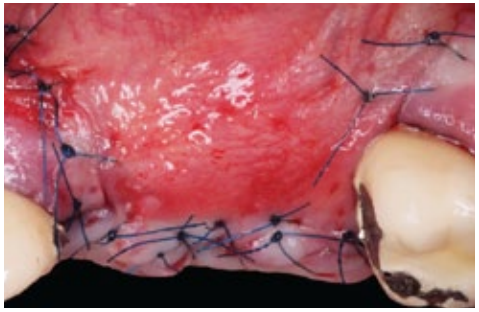


Fig. 9


Fig. 10

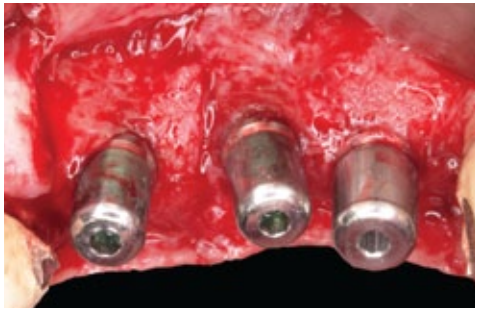


Fig. 11


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
Prof **Antonio J Murillo Rodriguez**
Eibar, Spain
email: dr.murillo@clinicairazabal.com
www.clinicairazabal.com

Bone substitute: **OsteoBiol® *Apatos***
For more information on OsteoBiol® *Apatos* see page 42

Barrier: **OsteoBiol® *Lamina***
For more information on OsteoBiol® *Lamina* see page 62

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

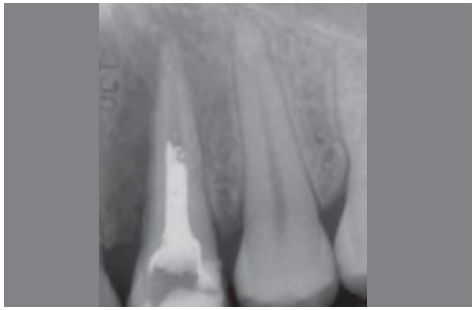


Fig. 1

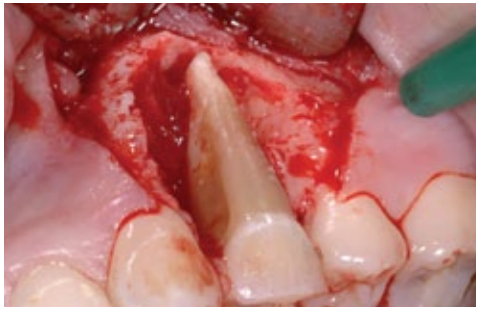


Fig. 2

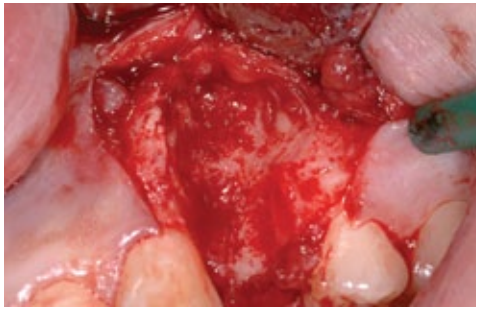


Fig. 3


Fig. 4


Fig. 5


Fig. 6


Fig. 7

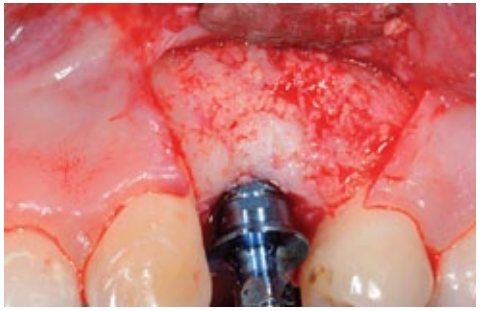


Fig. 8

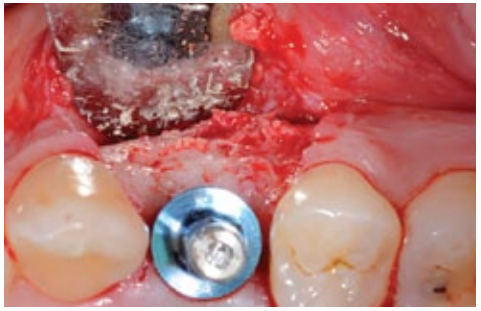


Fig. 9


Fig. 10

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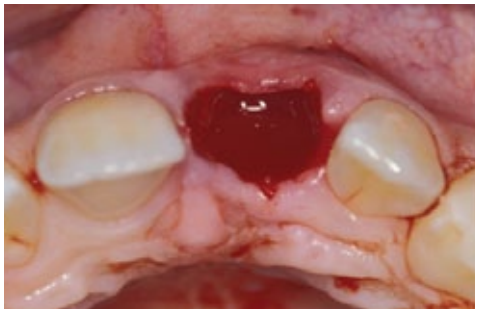
Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3* see page 30


Fig. 1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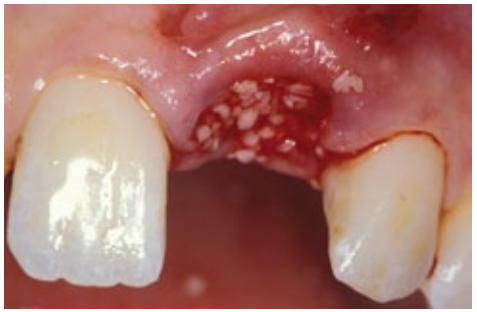
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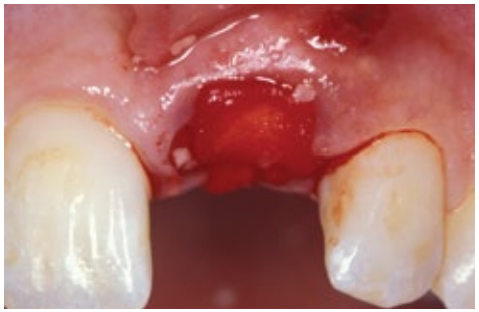
Fig. 5


Fig. 6


Fig. 7


Fig. 8


Fig. 9

Sex: **female** | Age: **21**

Fig. 1 Initial situation

Fig. 2 Soft tissues collapse after tooth extraction

Fig. 3-4 Graft with OsteoBiol® *Gen-Os*® and PRP

Fig. 5 Socket seal with fibrin and PRP sponge

Fig. 6 Provisional tooth

Fig. 7 Implant positioning with flapless technique

Fig. 8-9 Final result

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Bone substitute: **OsteoBiol® *Gen-Os*®**
For more information on OsteoBiol® *Gen-Os*® see page 22

Case report Regeneration of a fenestration defect

Sex: **male** | Age: **34**

Fig. 1 Preoperative image

Fig. 2 Placement of the implants, where it is possible to observe a fenestration defect

Fig. 3 Defect treated with OsteoBiol® *Putty*

Fig. 4 Creation of a pocket for the introduction of more OsteoBiol® *Putty* to fill the defect

Fig. 5 Surgical re-entry, where it is possible to observe the bone regeneration

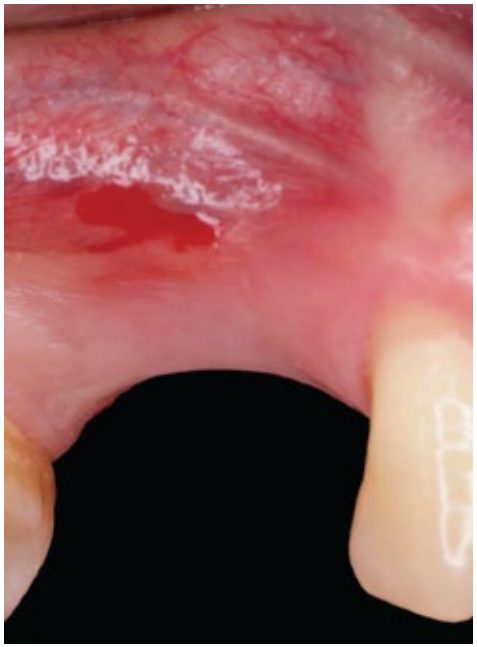
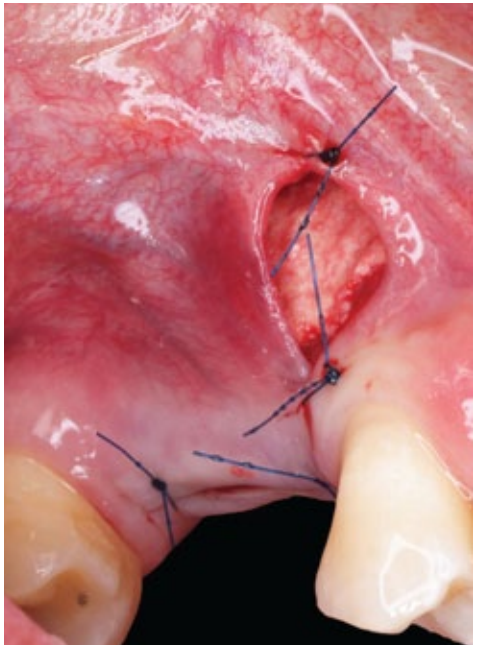


Fig. 1

Fig. 2

Fig. 3



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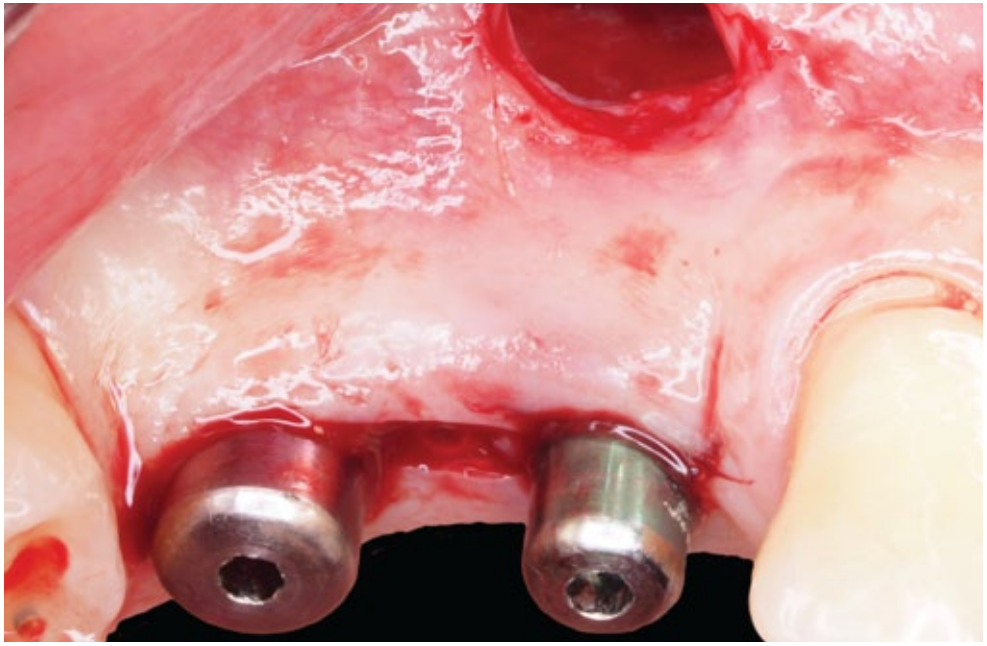

Fig. 5

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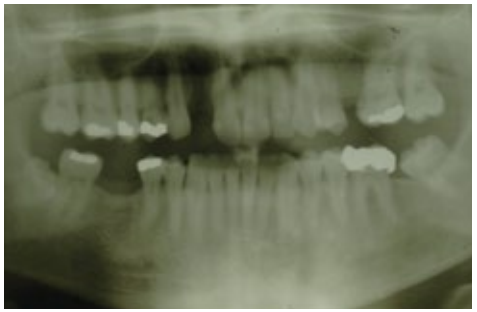
Bone substitute: **OsteoBiol® *Putty***
For more information on OsteoBiol® *Putty* see page 34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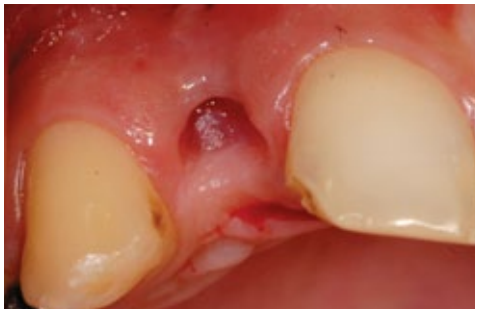
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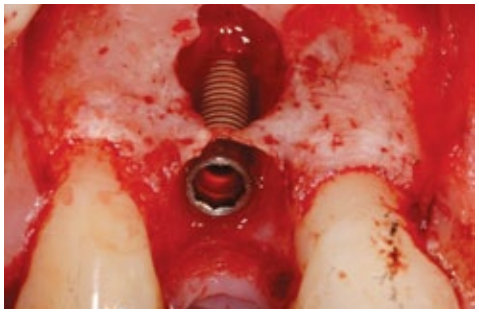
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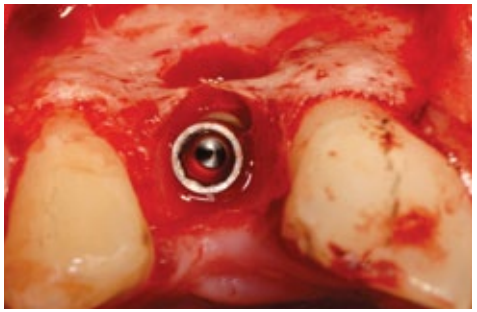
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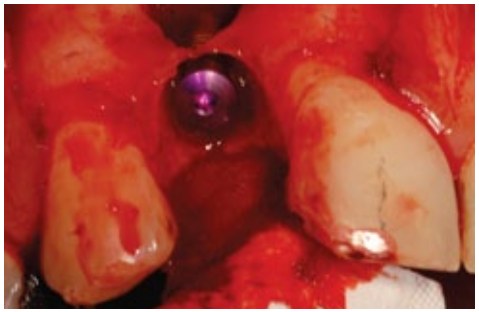
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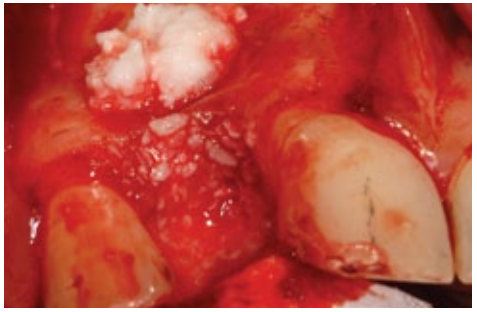
Fig. 6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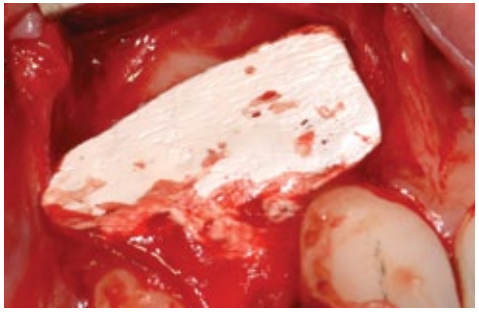
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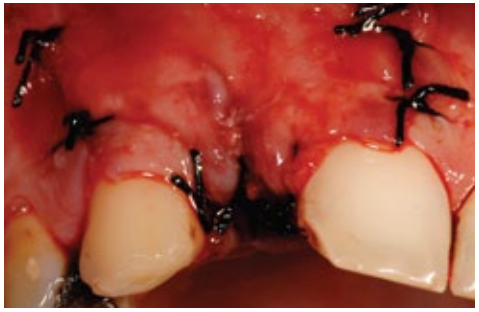
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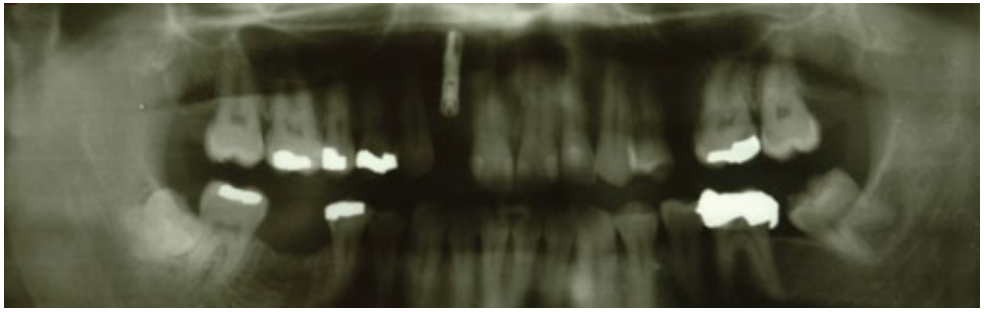
Fig. 10

DEHISCENCES AND FENESTRATIONS

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

Fig. 1 OPT exam: the defect area is 1.2

Fig. 2 Clinical inspection of edentulous area 1.2

Fig. 3 Implant placed with a significant vestibular dehiscence

Fig. 4 A considerable bone resorption is evident from the occlusal view

Fig. 5 An OsteoBiol® *Evolution* standard membrane is fixed to the palatal bone

Fig. 6 OsteoBiol® *mp3*® is grafted into the defect

Fig. 7 Self-contained defect fully filled with OsteoBiol® *mp3*®

Fig. 8 The membrane is adapted to the vestibular side and soaked with blood

Fig. 9 Suture

Fig. 10 OPT exam with implant in 1.2

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Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3* see page 30

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 54

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

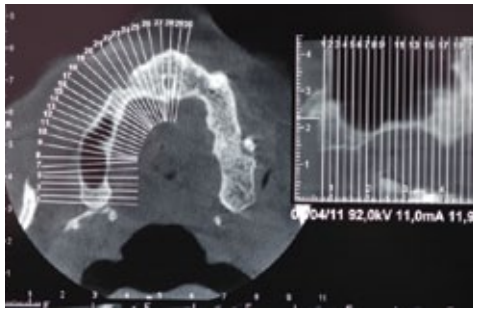

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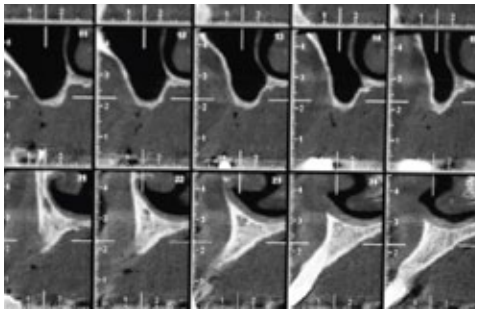
Fig. 2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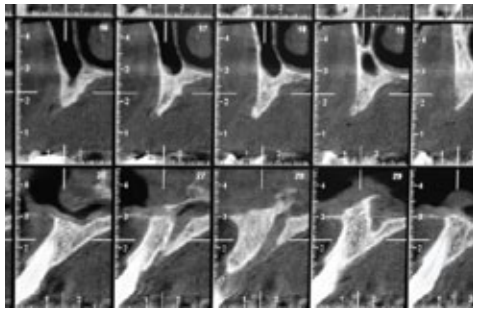
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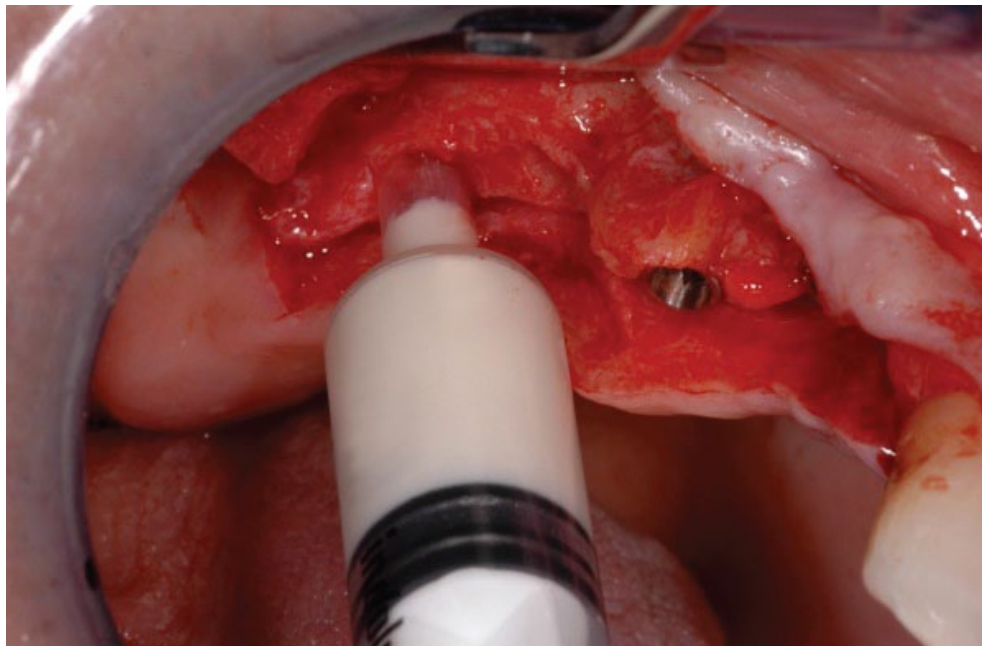
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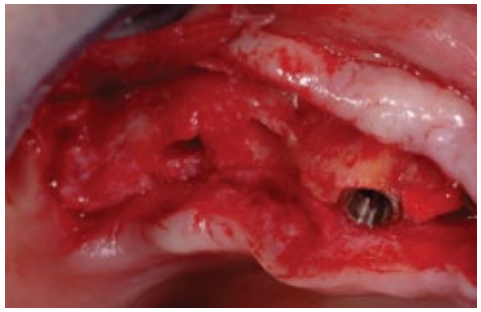
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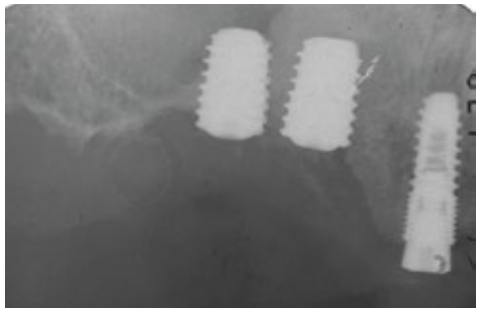
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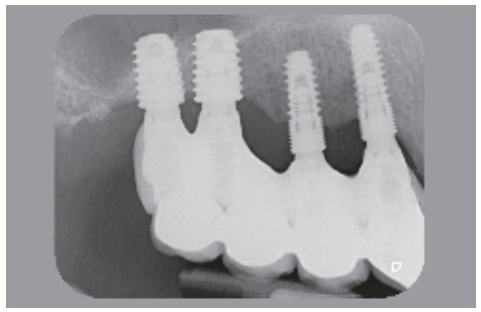
Fig. 8

Documentation provided by
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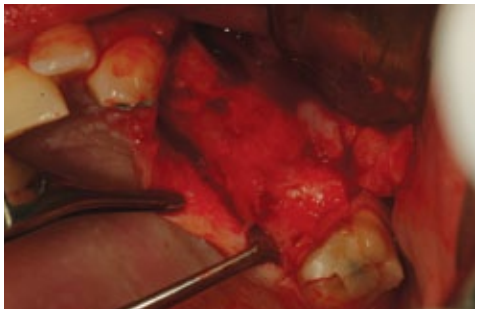
Bone substitute: **OsteoBiol® *Gel 40***
For more information on OsteoBiol® *Gel 40* see page 38


Fig. 1


Fig. 2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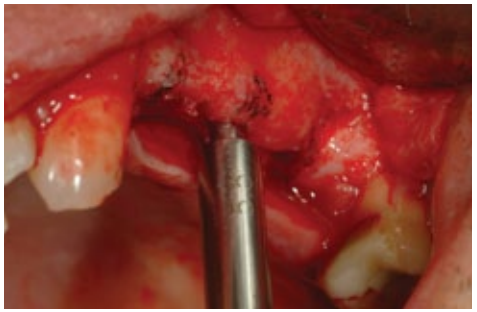
Fig. 4


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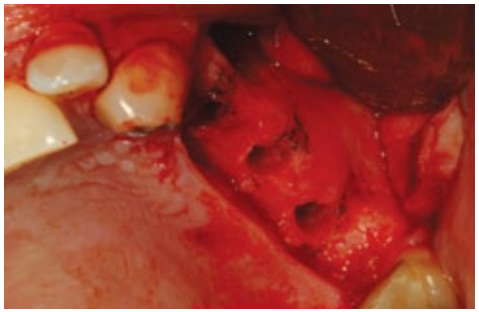
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Fig. 7


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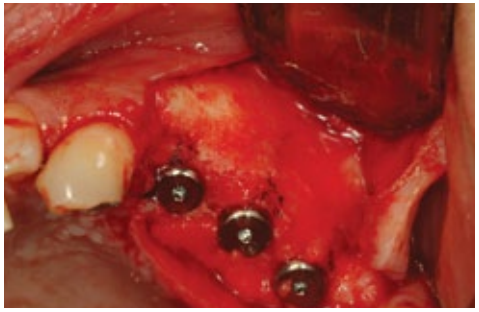
Fig. 9


Fig. 10


Fig. 11


Fig. 12

CRESTAL ACCESS SINUS LIFT

Sex: **male** | Age: **45**

Fig. 1 Pre-operative panoramic x-ray

Fig. 2 Initial situation, the three missing teeth will be replaced by three single prothesis

Fig. 3 Flap opening and crest exposure, an horizontal defect is also present

Fig. 4 Osteotomy is performed on the three sites

Fig. 5 Maxillary sinus floor lifted with OsteoBiol® *Gel 40*

Fig. 6 Grafting has been completed and implants can now be inserted

Fig. 7 Three implants placed into position

Fig. 8 A mix of autologous bone and OsteoBiol® *Gel 40* is prepared

Fig. 9 The bone/biomaterials mixture is grafted on the vestibular side of the defect to complete the horizontal augmentation

Fig. 10 Flaps are repositioned and sutured

Fig. 11 Post-operative panoramic x-ray

Fig. 12 Final situation

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Bone substitute: **OsteoBiol® *Gel 40***
For more information on OsteoBiol® *Gel 40* see page 38

Case report Bilateral sinus lift with lateral access

Sex: **female** | Age: **48**

Fig. 1 Initial x-ray OPT image showing a severe maxillary atrophy in the posterior region

Fig. 2 Pre-operative intraoral image, right sector

Fig. 3 Osteotomy to access the right maxillary sinus

Fig. 4 Intraoral image showing the right maxillary sinus filled with OsteoBiol® *mp3*®

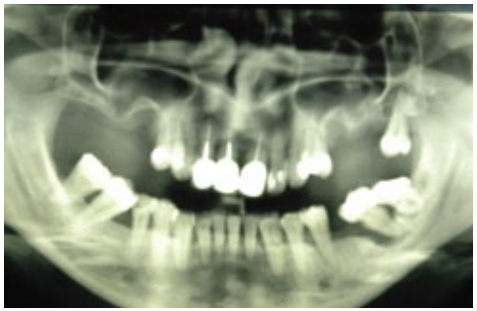
Fig. 5 Suture of mucoperiosteal flap

Fig. 6 Osteotomy to access the left maxillary sinus

Fig. 7 Intraoral image showing the left maxillary sinus filled with OsteoBiol® *mp3*®

Fig. 8 A properly shaped OsteoBiol® *Special* membrane was placed as left maxillary sinus antrostomy covering

Fig. 9 X-ray image after 8 months from sinus lift surgery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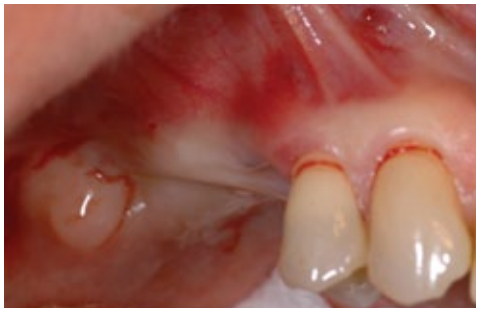
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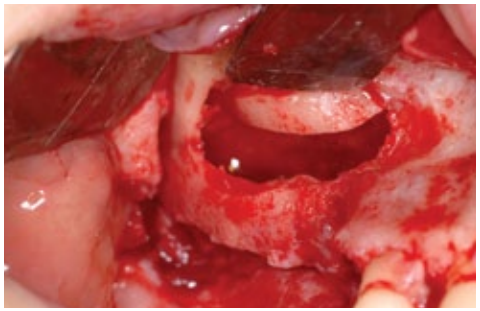
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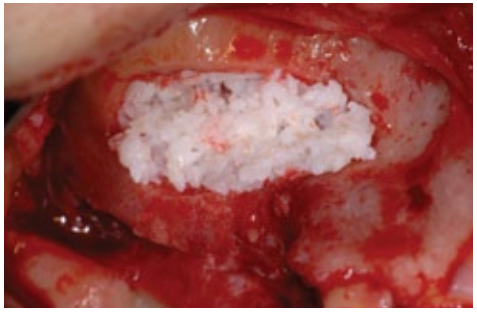
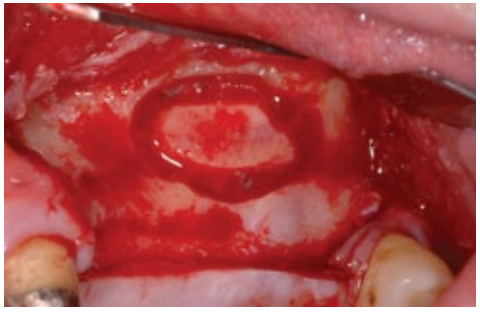


Fig. 4


Fig. 5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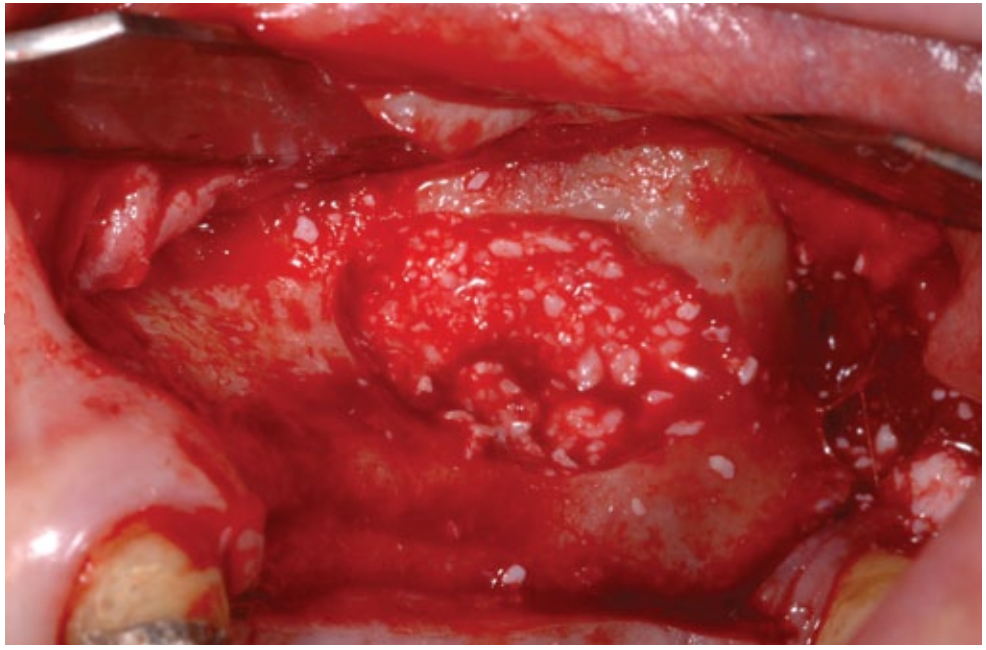
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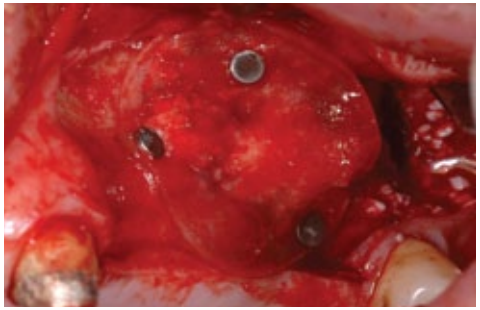
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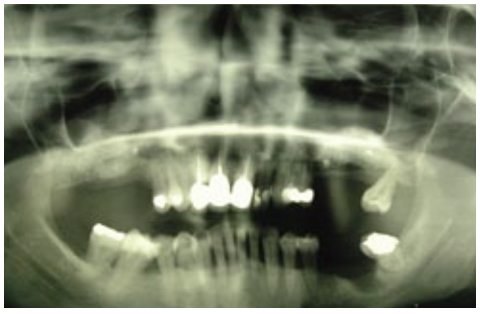
Fig. 9

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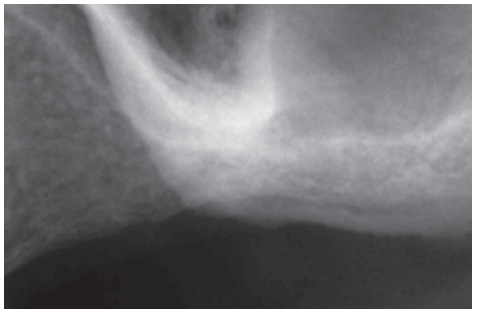
Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 30

Membrane: **OsteoBiol® *Special***
For more information on OsteoBiol® *Special* see page 66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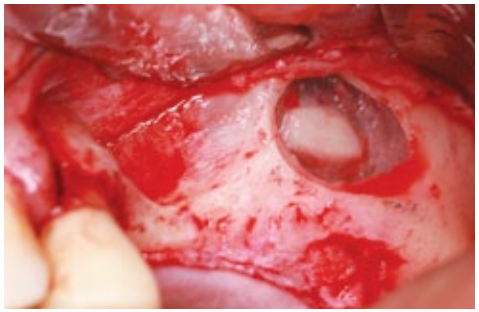
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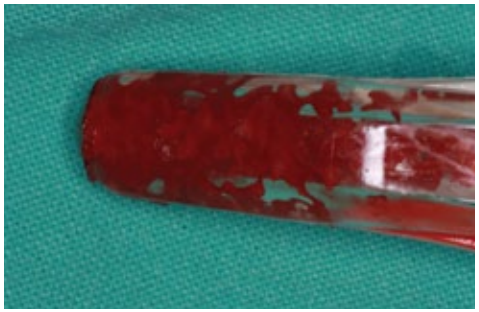
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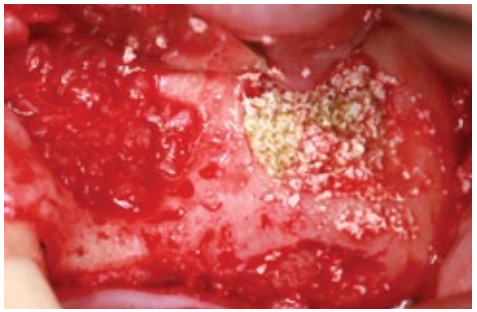
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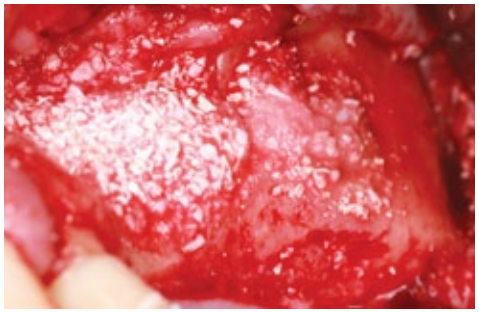
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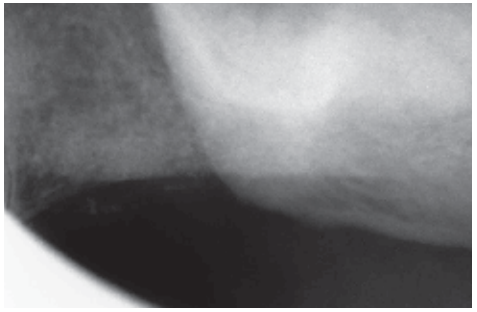
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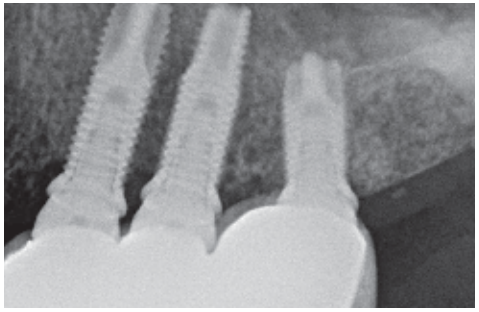
Fig. 8


Fig. 9

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

Fig. 1 Pre-operative radiograph showing insufficient residual bone height in the left maxillar quadrant

Fig. 2 Osteotomy to access the maxillary sinus. Note the buccal concavity of the maxilla showing a horizontal bone defect

Fig. 3 Autogenous bone collected with a bone scraper from the tuberosity and anterior wall of the maxilla

Fig. 4 Grafting of the buccal concavity with autogenous bone and insertion of OsteoBiol® *Apatos* in the sinus

Fig. 5 Grafting with OsteoBiol® *mp3®*, overlaying the previous biomaterial and the autogenous bone

Fig. 6 Placement of an OsteoBiol® *Evolution* collagen membrane covering the sinus window in two layers

Fig. 7 Post-operative x-ray

Fig. 8 Post-operative x-ray showing the rehabilitation 15 months after the sinus lift and 9 months after implant placement (delayed placement)

Fig. 9 Final restoration in place

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Bone substitute: **OsteoBiol® *mp3®***
For more information on OsteoBiol® *mp3®* see page 30

Bone substitute: **OsteoBiol® *Apatos***
For more information on OsteoBiol® *Apatos* see page 42

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 54

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

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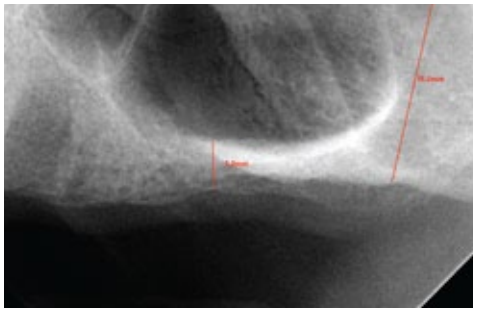
Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 30

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 54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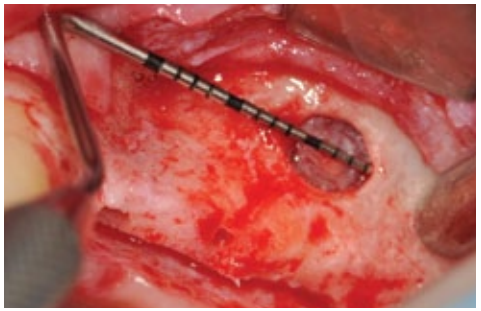
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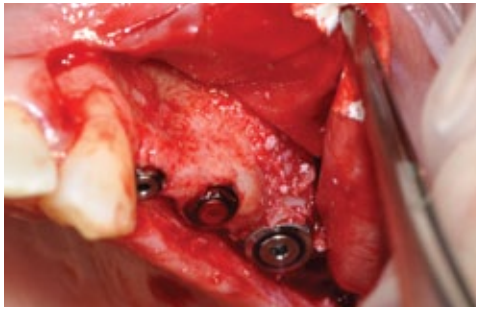
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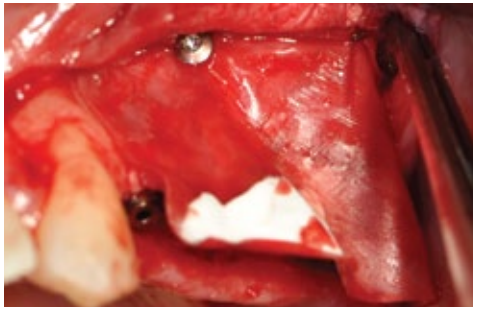
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Fig. 8


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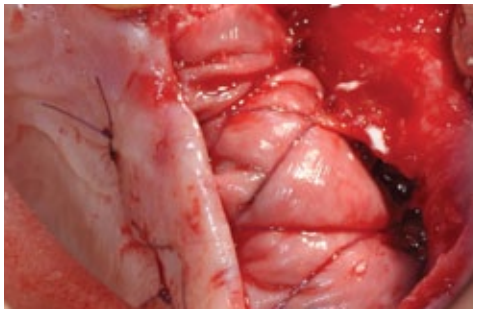
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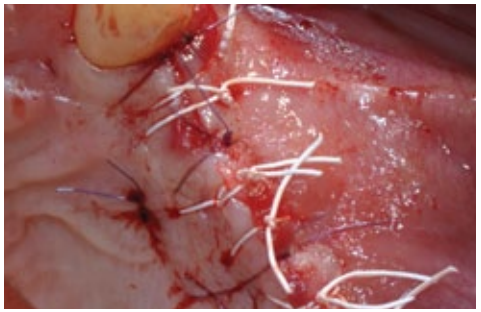
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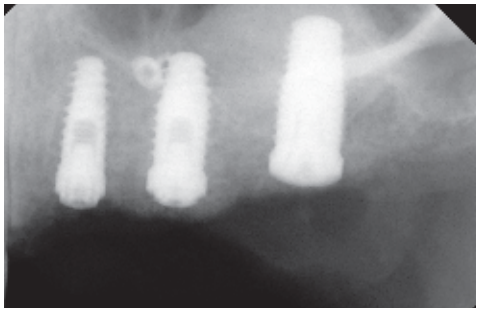
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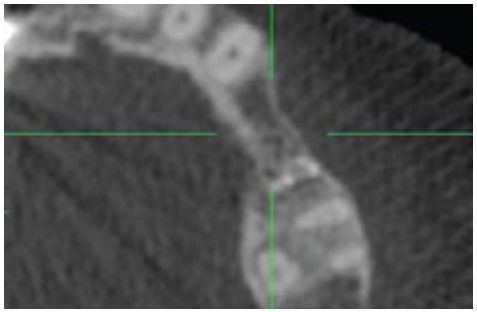
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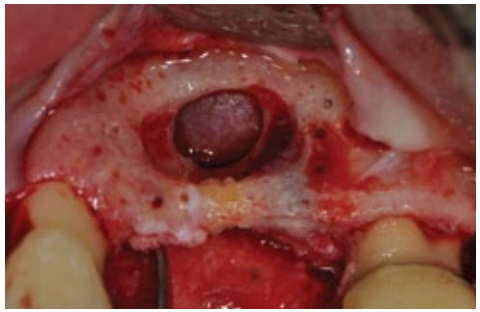
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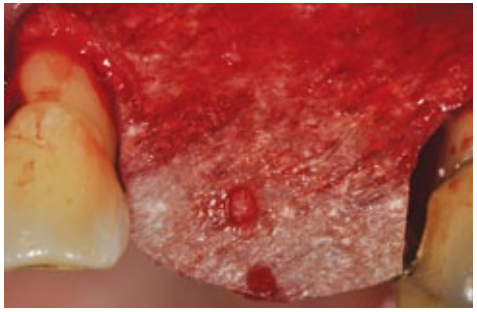
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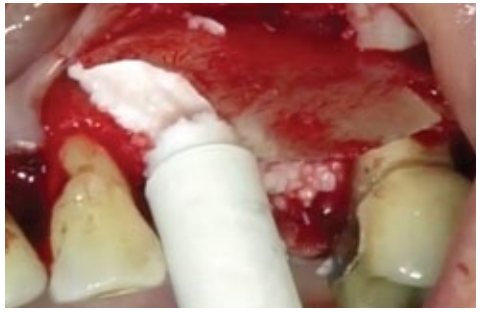
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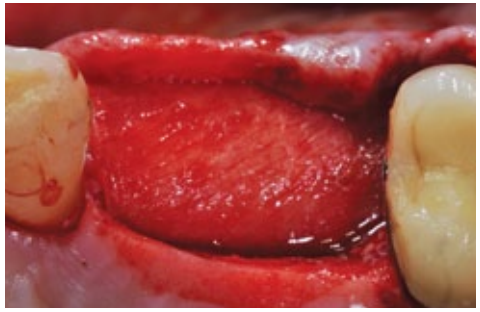
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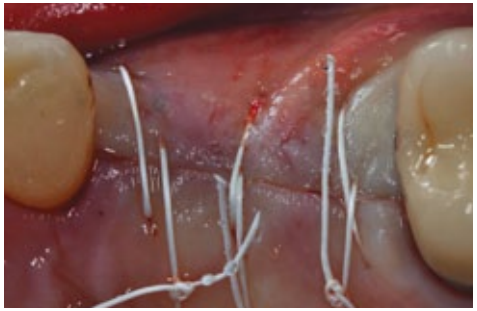
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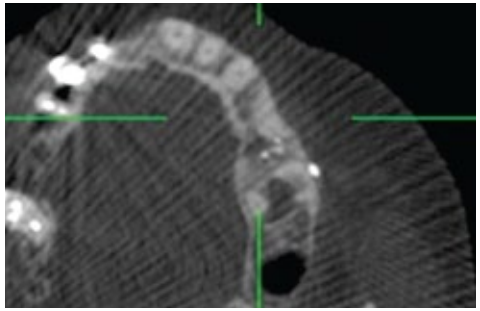
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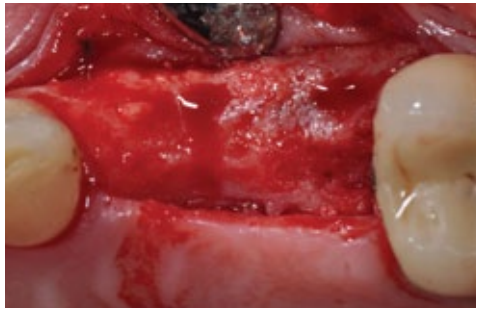
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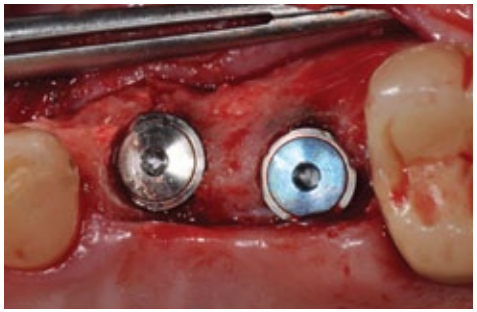
Fig. 10


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

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Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 30

Barrier: **OsteoBiol® *Lamina***
For more information on OsteoBiol® *Lamina* see page 62

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

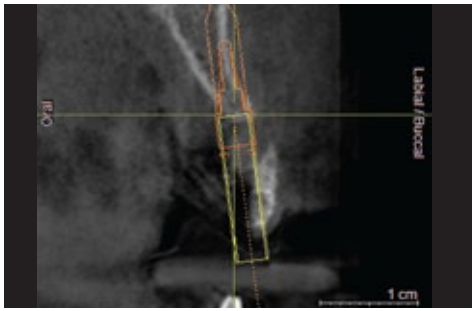
Fig. 4 Intra-operative view of a 3,4 mm implant with a "bone bridge" in the area of the implant head and the main part of the implant body outside of the bony envelope

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



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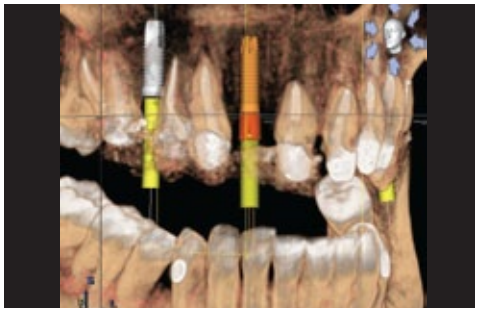
Fig. 2


Fig. 3


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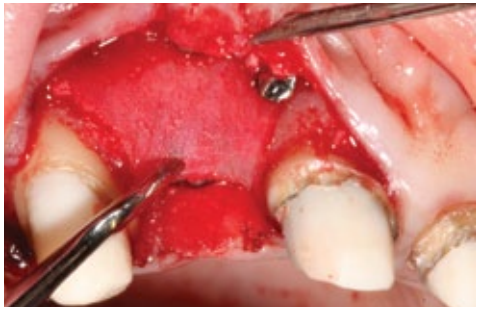
Fig. 5


Fig. 6


Fig. 7


Fig. 8


Fig. 9

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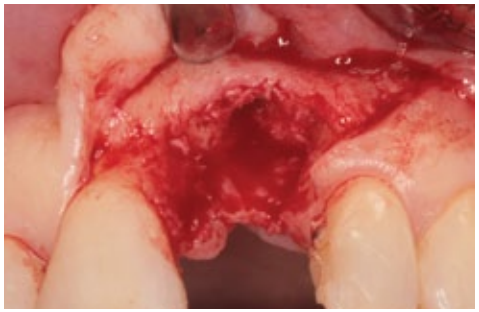
Bone substitute: **OsteoBiol® *mp3*®**
For more information on OsteoBiol® *mp3*® see page 30

Barrier: **OsteoBiol® *Lamina***
For more information on OsteoBiol® *Lamina* see page 62


Fig. 1


Fig. 2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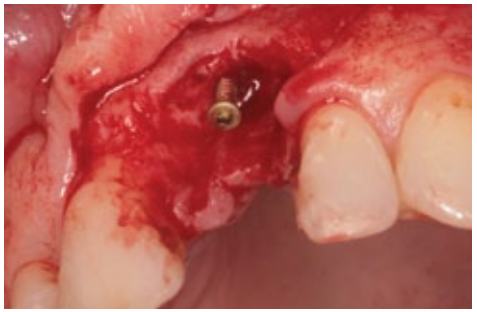
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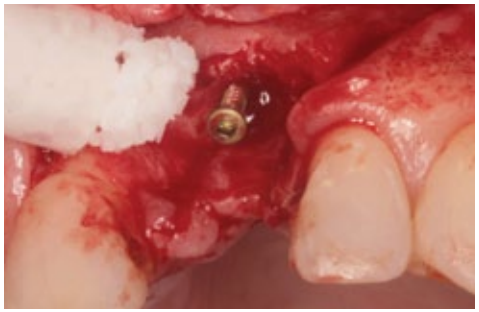
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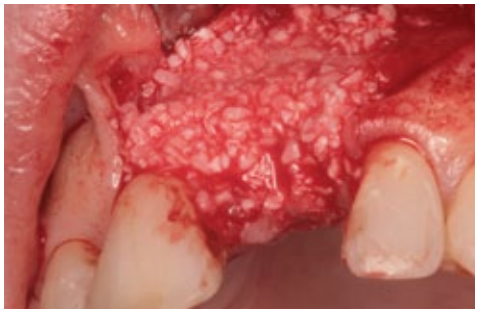
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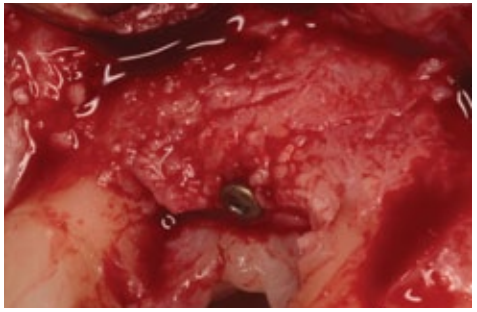
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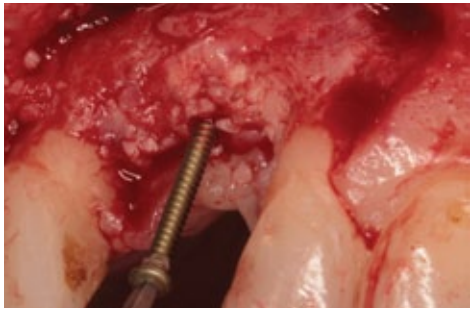
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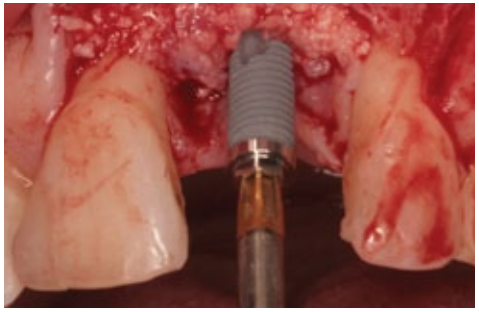
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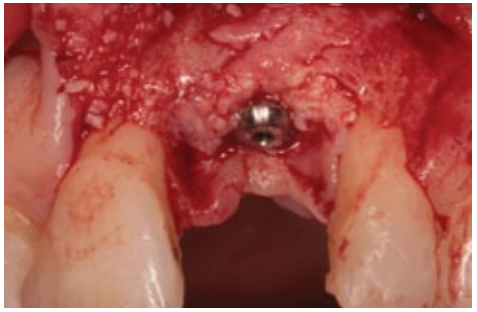
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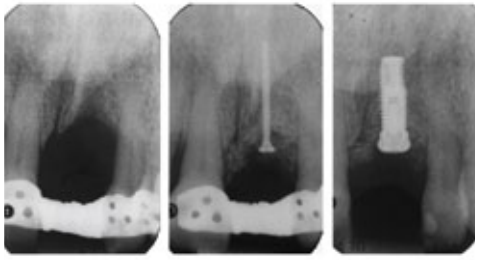
Fig. 11


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

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Bone substitute: **OsteoBiol® *mp3®***
For more information on OsteoBiol® *mp3®* see page 30

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

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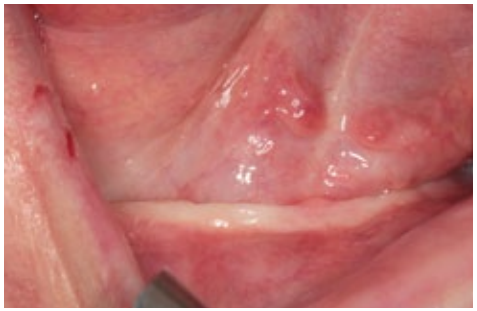
Bone substitute: **OsteoBiol® *Sp-Block***
For more information on OsteoBiol® *Sp-Block* see page 48

Bone substitute: **OsteoBiol® *Gen-Os*®**
For more information on OsteoBiol® *Gen-Os* see page 22

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 54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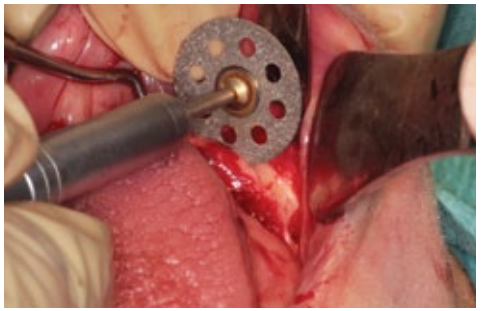
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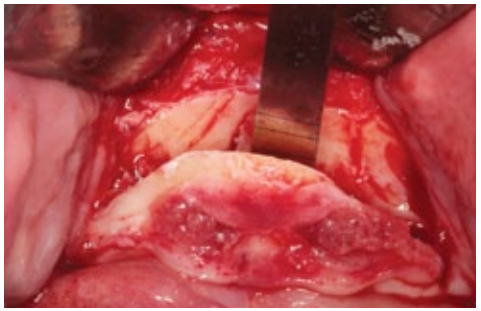
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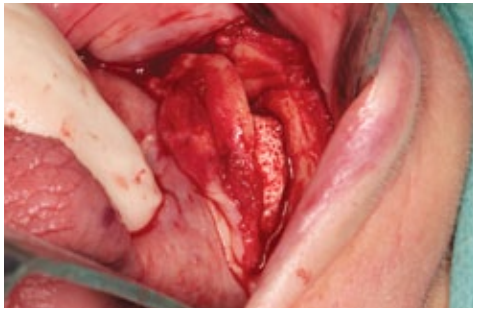
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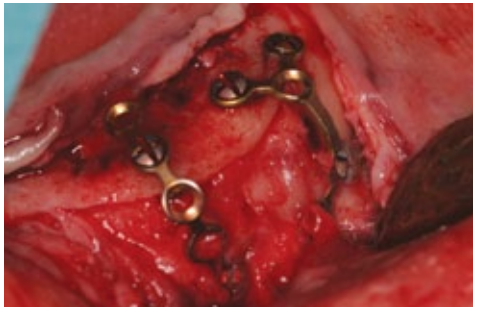
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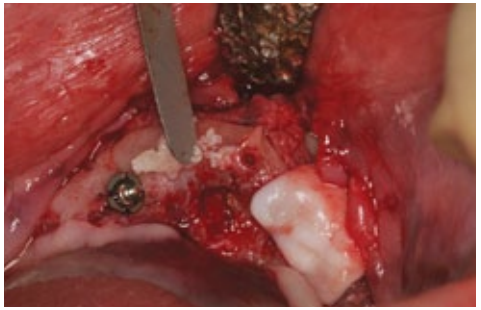
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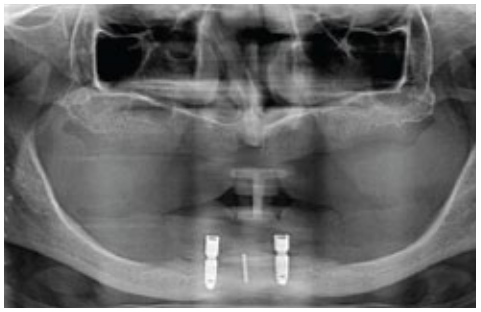
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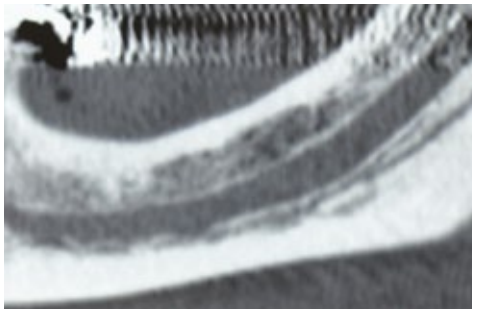
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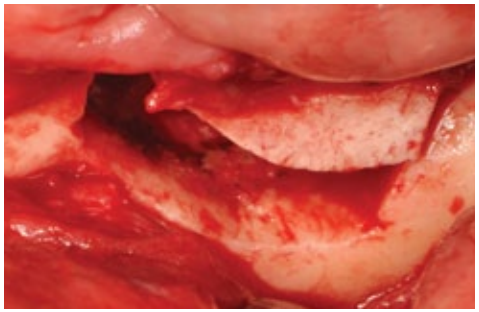
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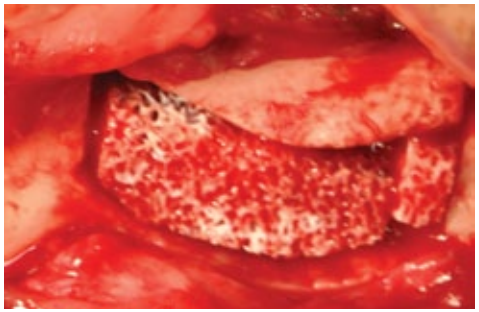
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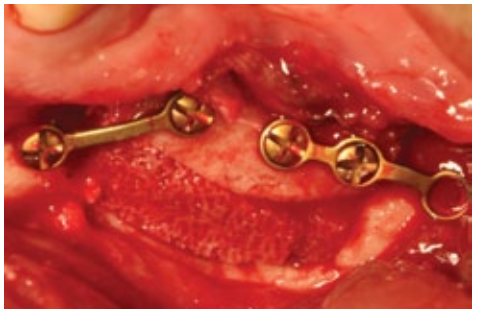
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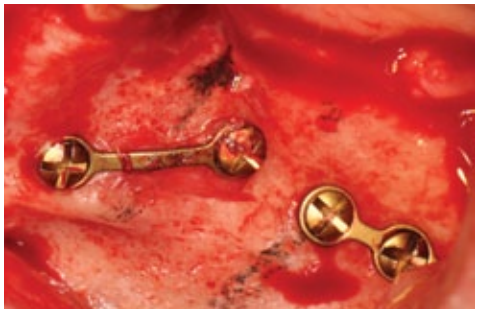
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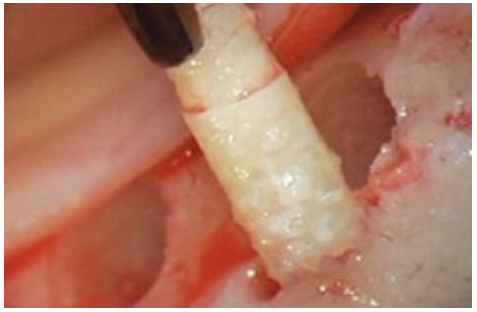
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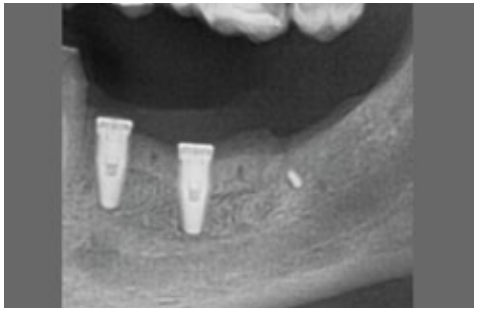
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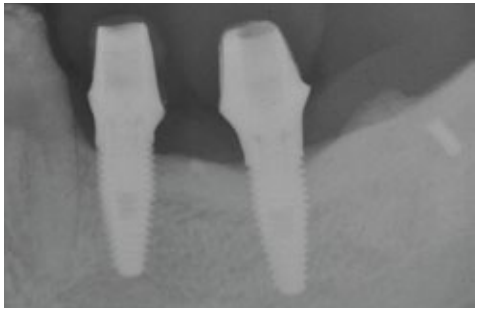
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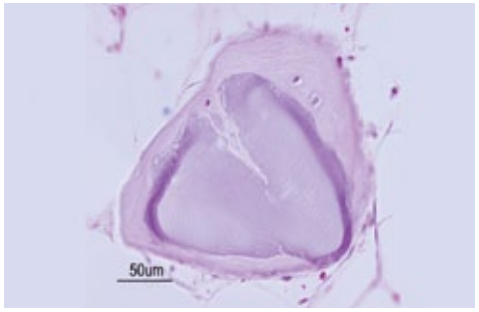

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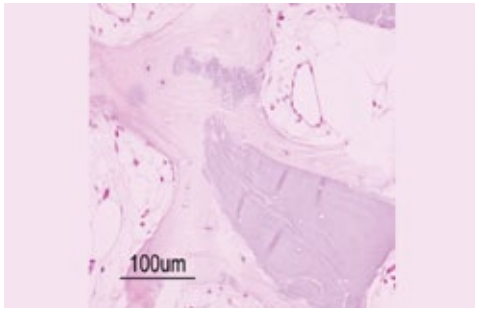

Fig. 12

VERTICAL AUGMENTATION

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

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

Bone substitute: **OsteoBiol® *Sp-Block***
For more information on OsteoBiol® *Sp-Block* see page 48

Case report Periodontal regeneration in the aesthetic area

Sex: **male** | Age: **47**

Fig. 1 Pre-operative x-ray: 4-mm defect

Fig. 2 Pocket probing depth (PPD) 6 mm

Fig. 3 Flap elevation

Fig. 4 Intrabony defect

Fig. 5 Treatment with OsteoBiol® *Gen-Os*®

Fig. 6 Covering with OsteoBiol® *Evolution*

Fig. 7 Double sling suture

Fig. 8 Double sling suture - Occlusal view

Fig. 9 Healing after 1 week

Fig. 10 CAL gain of 3 mm after 9 months

Fig. 11 PPD 3 mm after 1 year

Fig. 12 X-ray after 1 year

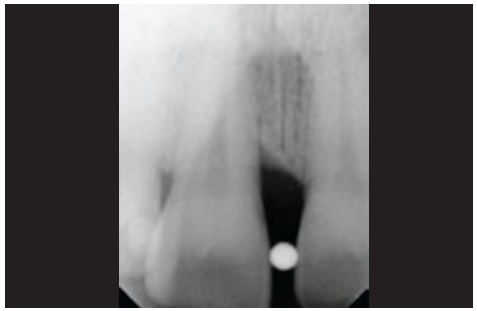
Fig. 1


Fig. 2


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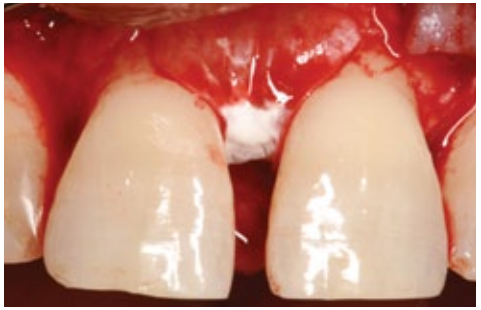
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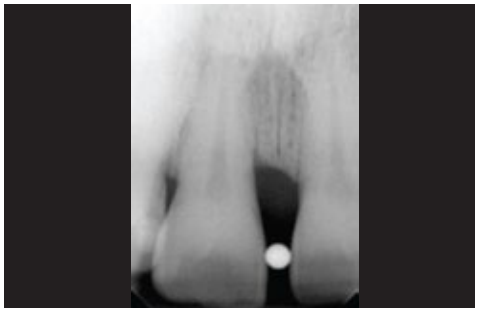
Fig. 12

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Bone substitute: **OsteoBiol® *Gen-Os*®**
For more information on OsteoBiol® *Gen-Os*® see page 22

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 54


Fig. 1


Fig. 2


Fig. 3


Fig. 4


Fig. 5


Fig. 6

Sex: **female** | Age: **35**

Fig. 1 Severe loss of attachment

Fig. 2 Pocket probing depth (PPD) 10 mm

Fig. 3 Intrabony 2-walls defect, 5 mm

Fig. 4 OsteoBiol® *Gen-Os*® graft covered with an *Evolution* membrane

Fig. 5 36-months follow up

Fig. 6 Attachment gain and regeneration of the intrabony defect

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Bone substitute: **OsteoBiol® *Gen-Os*®**
For more information on OsteoBiol® *Gen-Os*® see page 22

Membrane: **OsteoBiol® *Evolution***
For more information on OsteoBiol® *Evolution* see page 54

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

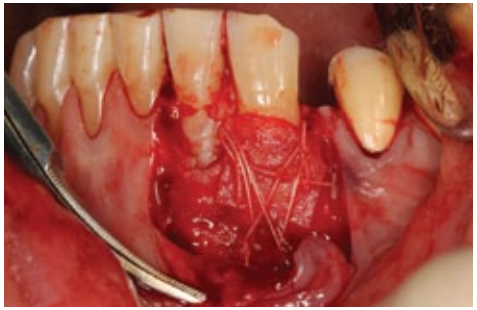
Fig. 9


Fig. 10


Fig. 11


Fig. 12

Documentation provided by
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Soft tissue: **OsteoBiol® *Derma***
For more information on OsteoBiol® *Derma* see page 58


Fig. 1

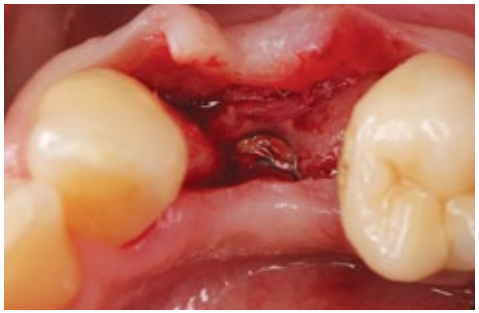
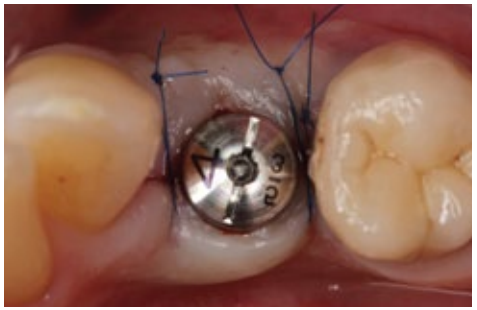


Fig. 2


Fig. 3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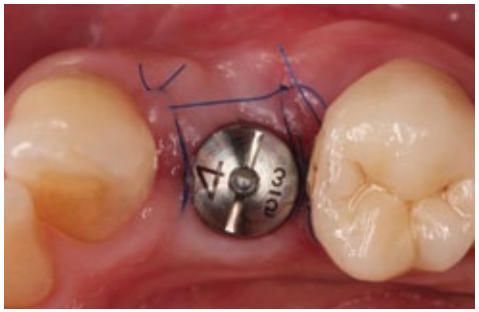
Fig. 5

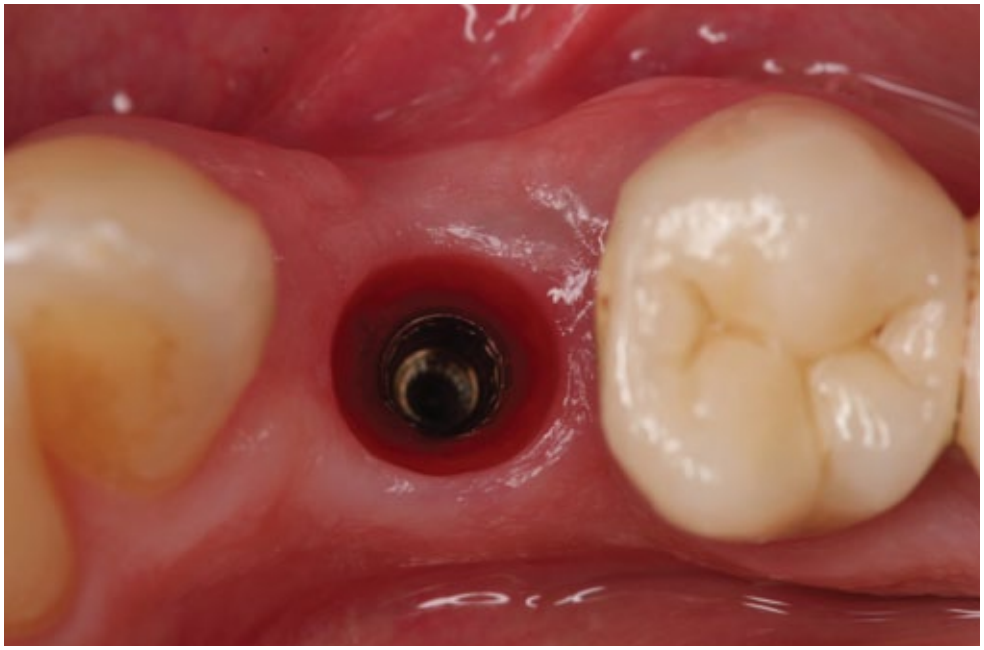
Fig. 6


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

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Soft tissue: **OsteoBiol® *Derma***
For more information on OsteoBiol® *Derma* see page 58

Bone, Biomaterials & Beyond

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Dr Patrick Palacci
Prof Ulf Nannmark

Sinus elevation and immediate implant placement in severely resorbed maxilla by using *mp3* and a compacting technique

Prof Stefan Fickl
Prof Antonio Barone

Soft tissue grafting - established techniques and new materials

Dr Giuseppe Verdino

***Dual-Block* technique**

Dr Roberto Rossi

Vertical and horizontal ridge augmentation with *Cortical Lamina* technique

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[3,4].
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[6,7].
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[8].

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) 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

(3) 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. EPUB 2011 NOV 2

(4) CALVO GUIRADO JL, GOMEZ MORENO G, GUARDIA J, ORTIZ RUIZ A, PIATTELLI A, BARONE A, MARTÌNEZ GONZÀLEZ JM, MESENGUER OLMO L, LÒPEZ MARÌ L, DORADO CB
BIOLOGICAL RESPONSE TO PORCINE XENOGRAFT IMPLANTS: AN EXPERIMENTAL STUDY IN RABBITS
IMPLANT DENT, 2012 APR;21(2):112-7

(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. EPUB 2013 MAY 3

(6) 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

(7) 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

(8) 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, 2014 MAY 26 EPUB AHEAD OF PRINT

Why xenografts?

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 various animal species connective tissues, 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[2]. 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, by avoiding the high temperature ceramization phase, to preserve the structure of natural hydroxyapatite and therefore allow an osteoclastic-type remodeling of biomaterial, similar to physiological bone turnover time[3].
Thanks to this innovative technology, the OsteoBiol® line has the following important characteristics:

1. Absence of a foreign body response[4]
2. Gradual resorption over time[3,5]
3. Stimulation and acceleration of physiological tissue healing process[6]
4. Protection of the grafting site from infection (membranes)[7,8]
5. Capability of carrying medication to the surgical site[9]

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) 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

(3) 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. EPUB 2008 JAN 30

(4) 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

(5) FBARONE 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. EPUB 2010 MAY 11

(6) 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

(7) 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. EPUB 2012 JUL 12

(8) 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, 2014 MAR 1 EPUB AHEAD OF PRINT

(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, 2014 SEP 15 EPUB AHEAD OF PRINT

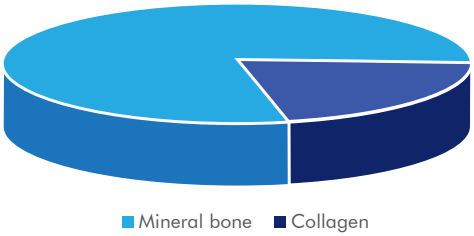
Collagen: a key factor for clinical success

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[2-4].
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[5]
- it increases the proliferation rate of the osteoblasts up to 2/3 times[6]
- it stimulates the activation of the platelets, osteoblasts and osteoclasts in the tissue healing process

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*®**



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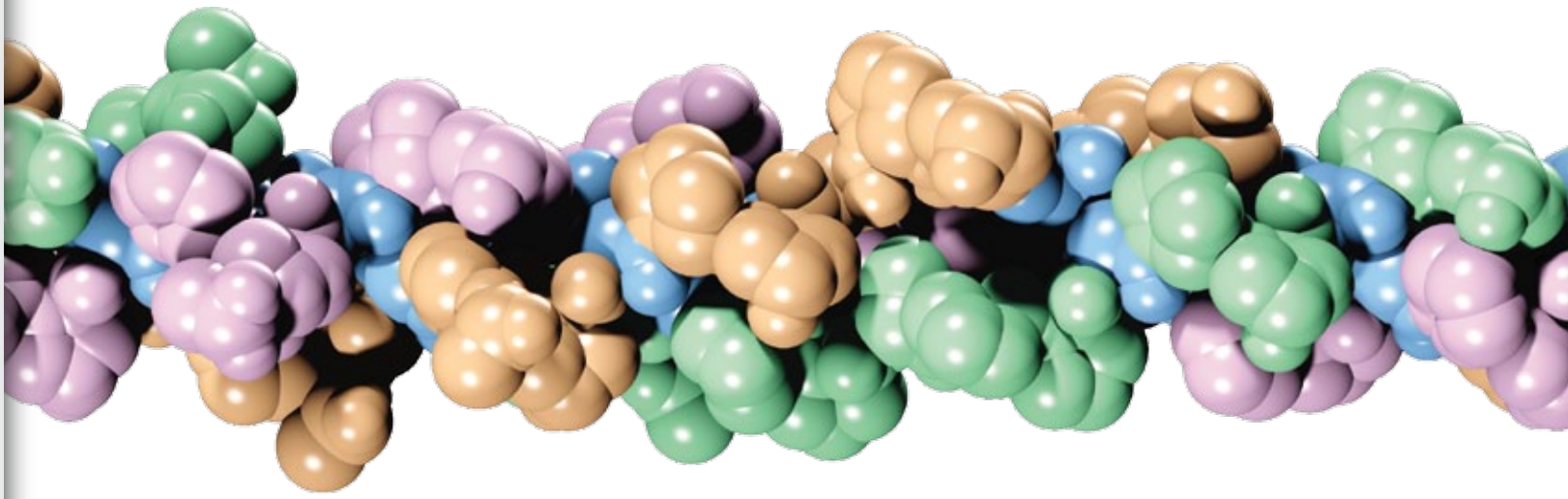

BIBLIOGRAPHY

(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
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(2) 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. EPUB 2011 DEC 12

(3) 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

(4) CASSETTA M, PERROTTI V, CALASSO S, PIATTELLI A, SINJARI B, IEZZI G
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CLIN ORAL IMPLANTS RES, 2014 MAY 26 EPUB AHEAD OF PRINT

(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

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

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[5] while as a resorbable membrane it is able to guide connective tissue regeneration.

BIBLIOGRAPHY

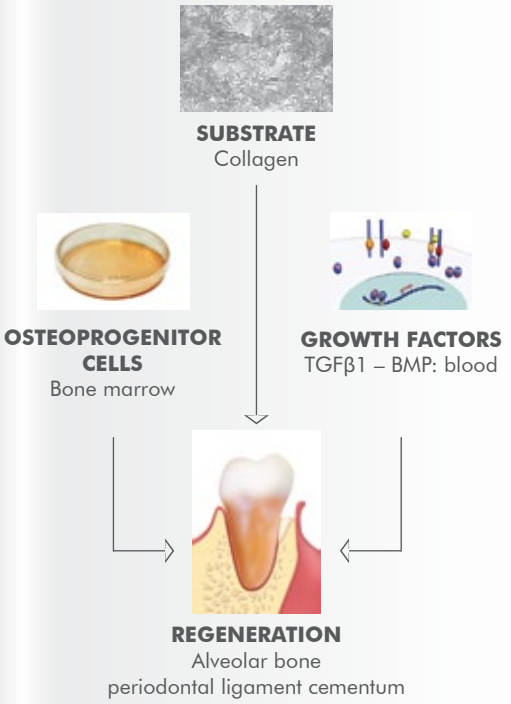
(1) GRIFFITH LG, NAUGHTON G
TISSUE ENGINEERING-CURRENT CHALLENGES AND EXPANDING OPPORTUNITIES
SCIENCE 2002, 295:1009-14

(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. EPUB 2008 JAN 30

"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

CERTIFICATIONS

Certifications CE certificates

Istituto Superiore di Sanità

ATTESTATO DI CERTIFICAZIONE CE

EC CERTIFICATION DOCUMENT

L'Istituto Superiore di Sanità, Organismo Notificato n° 0373, attesta che il dispositivo medico

Linea OsteoBiol
Matrice ossea e collagenica, sterile

fabbricato da / manufactured by

TECNOSS S.r.l.
SEDE LEGALE/ REGISTERED OFFICE: Via Morgbon, 34- 10100 Torino (TO) Italia

è conforme ai requisiti applicabili della Direttiva Europea 93/42/CEE e successive modificazioni.

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

Istituto Superiore di Sanità

ATTESTATO DI CERTIFICAZIONE CE

EC CERTIFICATION DOCUMENT

L'Istituto Superiore di Sanità, Organismo Notificato n° 0373, attesta che il dispositivo medico

Linea OsteoBiol -Membrane essiccate, sterili

fabbricato da / manufactured by

TECNOSS S.r.l.
SEDE LEGALE/ REGISTERED OFFICE: Via Morgbon, 34- 10100 Torino (TO) Italia

è conforme ai requisiti applicabili della Direttiva Europea 93/42/CEE e successive modificazioni.

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

Istituto Superiore di Sanità

ATTESTATO DI CERTIFICAZIONE CE

EC CERTIFICATION DOCUMENT

L'Istituto Superiore di Sanità, Organismo Notificato n° 0373, attesta che il dispositivo medico

Linea OsteoBiol
Feltri e Membrane di collagene liofilizzato equino, sterili

fabbricato da / manufactured by

TECNOSS S.r.l.
SEDE LEGALE/ REGISTERED OFFICE: Via Morgbon, 34- 10100 Torino (TO) Italia

è conforme ai requisiti applicabili della Direttiva Europea 93/42/CEE e successive modificazioni.

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

Istituto Superiore di Sanità

APPROVAZIONE DEL SISTEMA DI GARANZIA DELLA QUALITA' DELLA PRODUZIONE E/O DELLA STERILIZZAZIONE

APPROVAL OF QUALITY ASSURANCE SYSTEM FOR PRODUCTION AND/OR STERILIZATION

L'Istituto Superiore di Sanità, Organismo Notificato n° 0373, certifica che il sistema di garanzia della qualità della produzione e/o della sterilizzazione attuato da

TECNOSS S.r.l.
SEDE LEGALE/ REGISTERED OFFICE: Via Morgbon, 34- 10100 Torino (TO) Italia

per il dispositivo/i

Linea OsteoBiol
Matrice ossea e collagenica, sterile

è conforme ai requisiti applicabili della Direttiva Europea 93/42/CEE e successive modificazioni.

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

Istituto Superiore di Sanità

APPROVAZIONE DEL SISTEMA DI GARANZIA DELLA QUALITA' DELLA PRODUZIONE E/O DELLA STERILIZZAZIONE

APPROVAL OF QUALITY ASSURANCE SYSTEM FOR PRODUCTION AND/OR STERILIZATION

L'Istituto Superiore di Sanità, Organismo Notificato n° 0373, certifica che il sistema di garanzia della qualità della produzione e/o della sterilizzazione attuato da

TECNOSS S.r.l.
SEDE LEGALE/ REGISTERED OFFICE: Via Morgbon, 34- 10100 Torino (TO) Italia

per il dispositivo/i

Linea OsteoBiol -Membrane essiccate, sterili

è conforme ai requisiti applicabili della Direttiva Europea 93/42/CEE e successive modificazioni.

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

Istituto Superiore di Sanità

APPROVAZIONE DEL SISTEMA DI GARANZIA DELLA QUALITA' DELLA PRODUZIONE E/O DELLA STERILIZZAZIONE

APPROVAL OF QUALITY ASSURANCE SYSTEM FOR PRODUCTION AND/OR STERILIZATION

L'Istituto Superiore di Sanità, Organismo Notificato n° 0373, certifica che il sistema di garanzia della qualità della produzione e/o della sterilizzazione attuato da

TECNOSS S.r.l.
SEDE LEGALE/ REGISTERED OFFICE: Via Morgbon, 34- 10100 Torino (TO) Italia

per il dispositivo/i

Linea OsteoBiol
Feltri e Membrane di collagene liofilizzato equino, sterili

è conforme ai requisiti applicabili della Direttiva Europea 93/42/CEE e successive modificazioni.

Annex V | Equine Felts
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

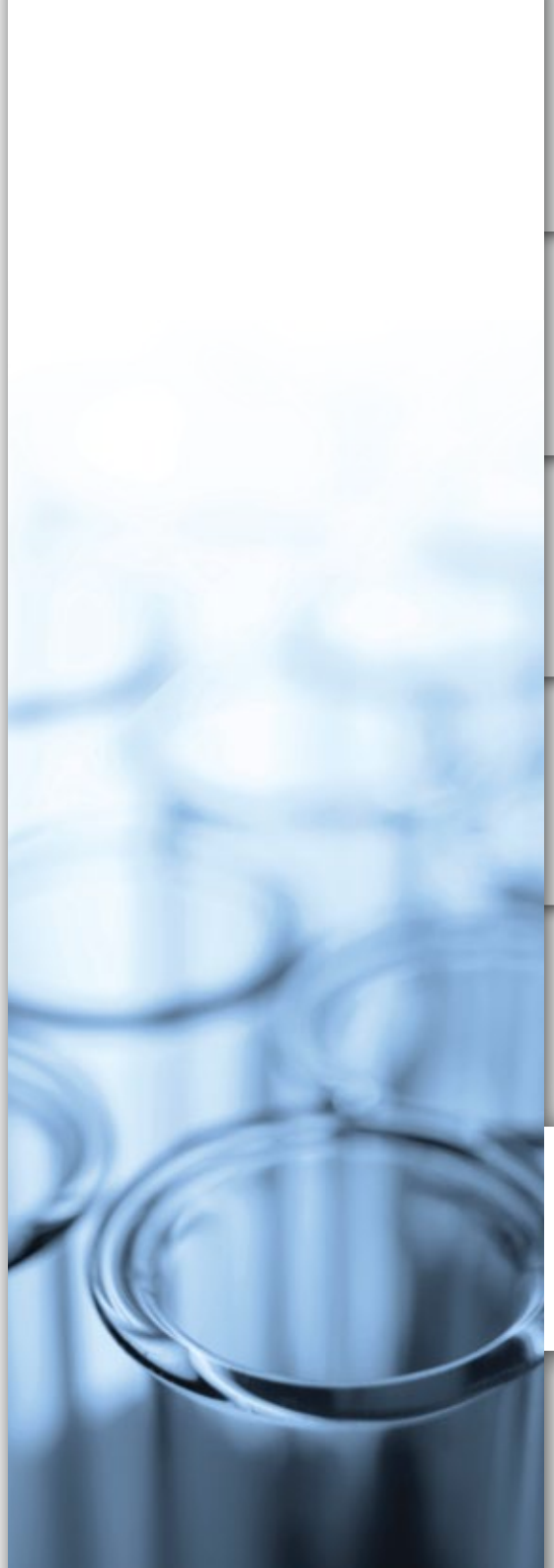
Salmonella typhimurium assay (reversion of mutation) was performed on 5 mutant strains of Salmonella typhimurium (TA1535, TA1537, TA98, TA100, TA102). The mutagenic activity of study material was defined by the computation of revertant colonies of test cultures in comparison with the number of revertant 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.

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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
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www.kiwacermet.it

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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

DIRETTIVA 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 22442:2008 [1-2-3]
"Animal tissues and their derivatives utilized in the manufacture of medical devices"

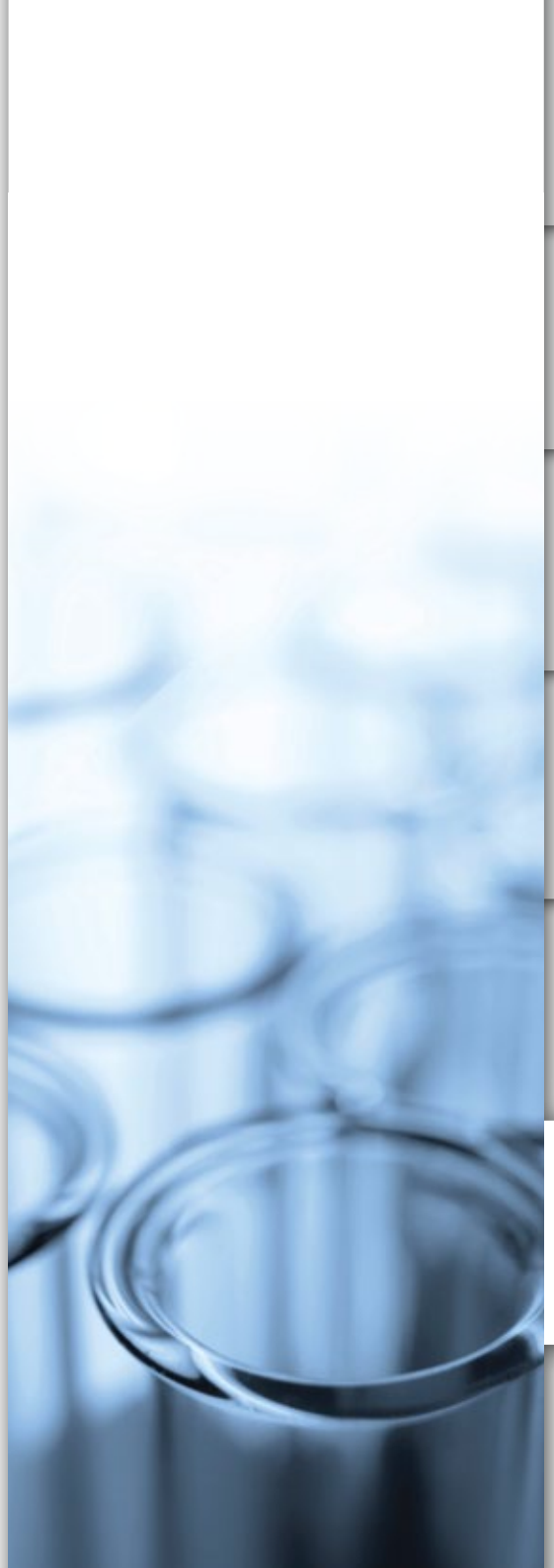
UNI EN ISO 11137-1:2013
"Sterilization of health care products - Radiation - Part 1: Requirements for development, validation and routine control of a sterilization process for medical devices"

UNI EN ISO 11137-2:2013
"Sterilization of health care products - Radiation - Part 2: Establishing the sterilization dose"

UNI EN 556-1:2002
"Sterilization of medical devices. Requirements for medical devices to be designated "STERILE". Requirements for terminally sterilized medical devices"

UNI CEI EN ISO 15223-1:2012
"Medical devices - symbols to be used with medical device labels, labelling and information to be supplied - part 1: general requirements "

MEDDEV 2.12-1 rev 8
Guidelines on a medical devices vigilance - 2013



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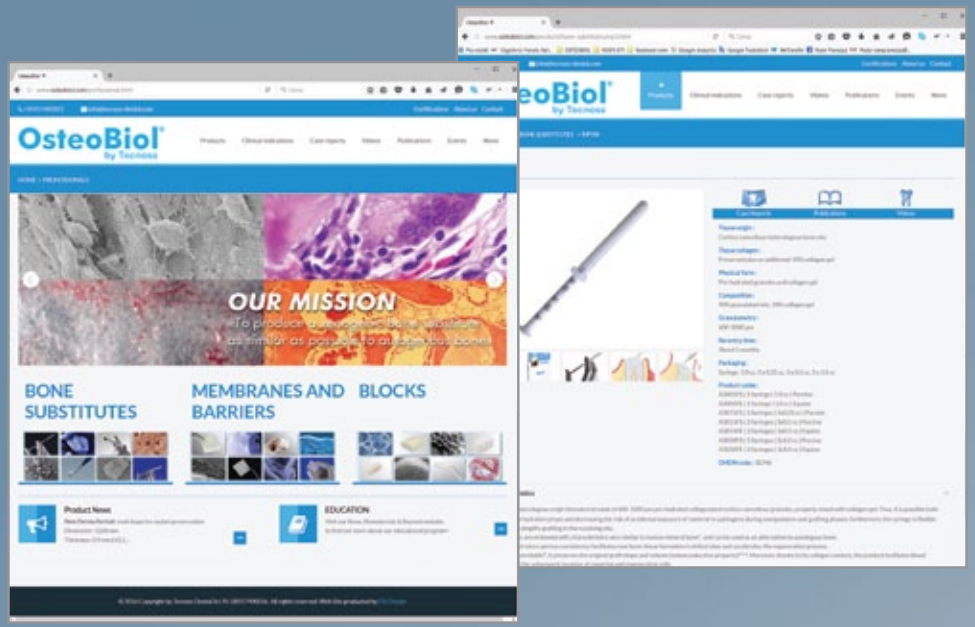

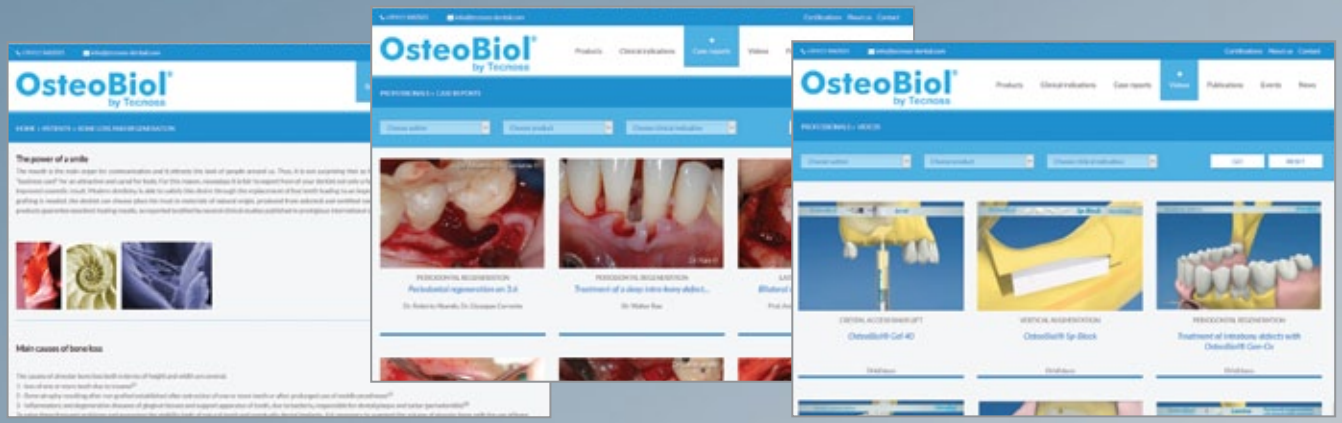

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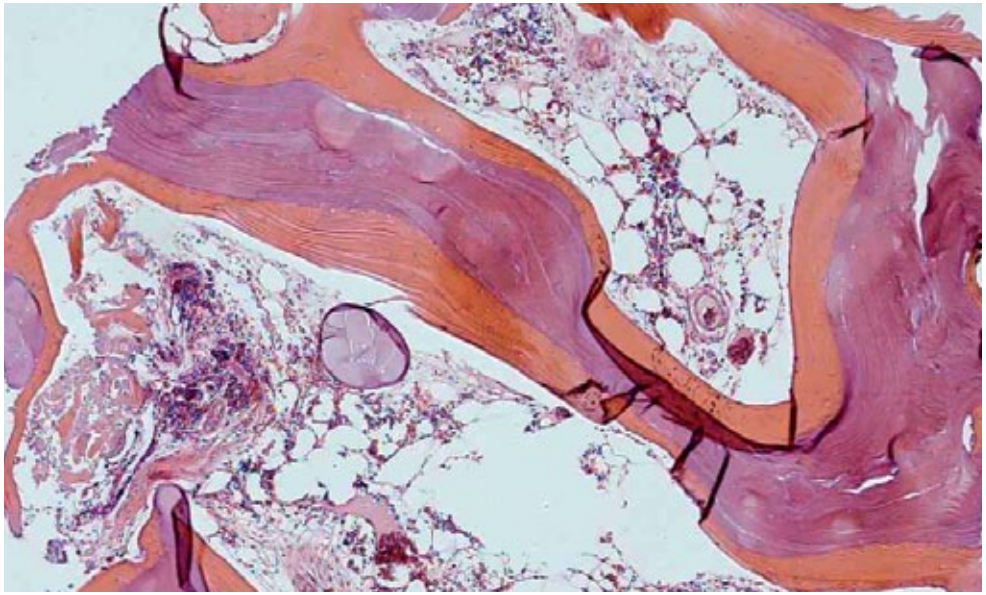

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1 | COVANI U, AMERI S, CRESPI R, BARONE A
PRESERVAZIONE DEL PROCESSO ALVEOLARE CON OSSO ETEROLOGO. CONSIDERAZIONI ISTOLOGICHE
ITALIAN ORAL SURGERY, 2004, VOL 3, 1: 17-23

2 | 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

3 | 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

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

6 | 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

7 | 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

8 | 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

9 | 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

10 | 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

11 | 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

12 | CALVO GUIRADO JL, PARDO ZAMORA G, SAEZ YUGUERO MR
RIDGE SPLITTING TECHNIQUE IN ATROPHIC ANTERIOR MAXILLA WITH IMMEDIATE IMPLANTS, BONE REGENERATION AND IMMEDIATE TEMPORISATION: A CASE REPORT
J IR DENT ASSOC 2007 WINTER;53(4):187-90

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

14 | 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. EPUB 2008 MAR 26

15 | 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

16 | 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

17 | 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

18 | 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

19 | 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. EPUB 2008 JAN 30

22 | CALVO GUIRADO JL, GOMEZ MORENO G, BARONE A, CUTANDO A, ALCARAZ BANOS M, CHIVA F, LOPEZ MARI L, GUARDIA J
MELATONIN PLUS PORCINE BONE ON DISCRETE CALCIUM DEPOSIT IMPLANT SURFACE STIMULATES OSTEOINTEGRATION IN DENTAL IMPLANTS
J PINEAL RES, 2009, 47(2):164-72

23 | 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

24 | 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

25 | CALVO GUIRADO JL, GOMEZ MORENO G, LOPEZ MARI L, ORTIZ RUIZ AJ, GUARDIA J
ATRAUMATIC MAXILLARY SINUS ELEVATION USING THREADED BONE DILATORS FOR IMMEDIATE IMPLANTS. A THREE-YEAR CLINICAL STUDY
MEDICINA ORAL, PATOLOGIA ORAL Y CIRUGIA BUCAL, 2010 MAR 1; 15(2):E366-70

26 | 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

27 | 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

28 | 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

29 | 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

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

31 | NANNMARK U, AZARMEHR I
SHORT COMMUNICATION: COLLAGENATED CORTICO-CANCELLOUS PORCINE BONE GRAFTS. A STUDY IN RABBIT MAXILLARY DEFECTS
CLINICAL IMPLANT DENTISTRY AND RELATED RESEARCH, 2010 JUN 1; 12(2):161-3

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

33 | CALVO GUIRADO JL, GOMEZ MORENO G, LOPEZ MARI L, GUARDIA J, MARINEZ GONZALEZ JM, TRESGUERRES IF, PAREDES SD, FUENTES BRETO L
ACTIONS OF MELATONIN MIXED WITH COLLAGENIZED PORCINE BONE VERSUS PORCINE BONE ONLY ON OSTEOINTEGRATION OF DENTAL IMPLANTS
J PINEAL RES, 2010, 48:194–203

34 | 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

35 | 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

37 | 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

38 | 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

39 | 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

40 | 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

41 | 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

42 | CALVO GUIRADO JL, RAMIREZ FERNANDEZ MP, NEGRI B, DELGADO RUIZ RA, MATÉ SANCHEZ DE VAL JE, GOMEZ MORENO G
EXPERIMENTAL MODEL OF BONE RESPONSE TO COLLAGENIZED XENOGRAFTS OF PORCINE ORIGIN (OSTEOBIOL® MP3®): A RADIOLOGICAL AND HISTOMORPHOMETRIC STUDY
CLIN IMPLANT DENT RELAT RES, 2013 FEB;15(1):143-51

43 | RAMIREZ FERNANDEZ MP, CALVO GUIRADO JL, DELGADO RUIZ RA, MATÉ SANCHEZ DE VAL JE, VICENTE ORTEGA V, MESEGUER OLMOS L
BONE RESPONSE TO HYDROXYAPATITES WITH OPEN POROSITY OF ANIMAL ORIGIN (PORCINE OSTEOBIOL® MP3®) AND BOVINE (ENDOBON®): A RADIOLOGICAL AND HISTOMORPHOMETRIC STUDY
CLIN ORAL IMPLANTS RES, 2011 JUL; 22(7):767-73

44 | 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

45 | 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

46 | 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

47 | 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

48 | 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

49 | 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

50 | 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

51 | 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

52 | 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

53 | 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

54 | CALVO GUIRADO JL, MATÈ SANCHEZ JE, DELGADO RUIZ L, RAMIREZ FERNANDEZ MP
CALCULATION OF BONE GRAFT VOLUME USING 3D RECONSTRUCTION SYSTEM
MED ORAL PATOL CIR BUCAL, 2011 MAR 1, 16(2):E260-4

55 | 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

56 | 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

57 | 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

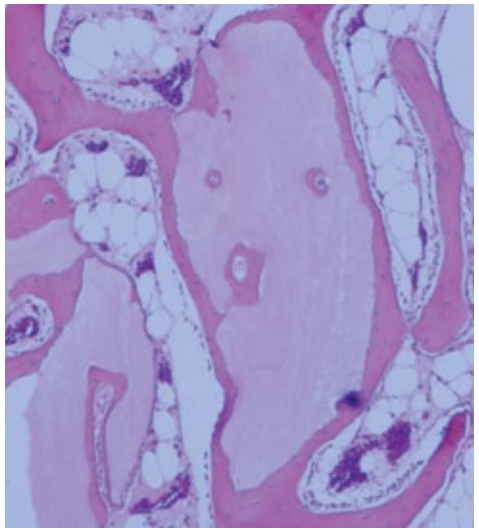
58 | CASSETTA M, RICCI L, IEZZI G, CALASSO S, PIATTELLI A, PERROTTI V
USE OF PIEZOSURGERY DURING MAXILLARY SINUS ELEVATION: CLINICAL RESULTS OF 40 CONSECUTIVE CASES
INT J PERIODONTICS RESTORATIVE DENT, 2012 DEC;32(6):E182-8

59 | BOTTINI LP, RICCI L, PIATTELLI A, PERROTTI V, IEZZI G
BUCCO-LINGUAL CRESTAL BONE CHANGES AROUND IMPLANTS IMMEDIATELY PLACED IN FRESH SOCKETS IN ASSOCIATION OR NOT WITH PORCINE BONE: A NON-BLINDED RANDOMIZED CONTROLLED TRIAL IN HUMANS
J PERIODONTOL, 2012 OCT 29, EPUB AHEAD OF PRINT

60 | 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

61 | 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

62 | 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



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63 | 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

64 | 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

65 | 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

66 | 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

67 | 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

68 | 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, 2013 MAY 17, EPUB AHEAD OF PRINT

69 | CALVO GUIRADO JL, GOMEZ MORENO G, GUARDIA J, ORTIZ RUIZ A, PIATTELLI A, BARONE A, MARTÌNEZ GONZÀLEZ JM, MESENGUER OLMO L, LÒPEZ MARÌ L, DORADO CB
BIOLOGICAL RESPONSE TO PORCINE XENOGRAFT IMPLANTS: AN EXPERIMENTAL STUDY IN RABBITS
IMPLANT DENT, 2012 APR;21(2):112-7

70 | 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

71 | 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

72 | 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, 2014 FEB 19 EPUB AHEAD OF PRINT

73 | 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, 2014 MAR 1 EPUB AHEAD OF PRINT

74 | 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, 2014 MAR 31 EPUB AHEAD OF PRINT

75 | B ARONE 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, 2014 MAY 22 EPUB AHEAD OF PRINT

76 | 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, 2014 MAY 26 EPUB AHEAD OF PRINT

77 | 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

78 | 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

79 | 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

80 | 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. EPUB 2014 SEP 15

81 | 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

82 | 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

83 | 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

84 | 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

85 | 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, 2015 JUN 11 EPUB AHEAD OF PRINT

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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

87 | 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, 2015 FEB 26 EPUB AHEAD OF PRINT

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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

89 | 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 EPUB 2015 JUL 4

90 | CALVO GUIRADO JL, AGUILAR SALVATIERRA A, RAMIREZ FERNANDEZ M, MATÉ SANCHEZ DEL VAL JE, DELGADO RUIZ RA, GOMEZ MORENO G
BONE RESPONSE TO COLLAGENIZED XENOGRAFTS OF PORCINE ORIGIN (MP3®) AND A BOVINE BONE MINERAL GRAFTING (4BONETM XBM) GRAFTS IN TIBIA DEFECTS: EXPERIMENTAL STUDY IN RABBITS
CLIN ORAL IMPLANTS RES, 2015 OCT;43(8):1583-8. EPUB 2015 JUL 4

91 | 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, 2015 OCT 10 EPUB AHEAD OF PRINT

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NEW BONE FORMATION IN BONE DEFECTS AFTER MELATONIN AND PORCINE BONE GRAFTS: EXPERIMENTAL STUDY IN RABBITS
CLIN ORAL IMPLANTS RES, 2015 APR;26(4):399-406. EPUB 2014 MAR 6

93 | 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 FEB 16. EPUB AHEAD OF PRINT

94 | 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

95 | 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

96 | 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
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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	
TSV Gel	1 Syringe	GEL	0.5 g	TSV005S	TSV005E
TSV Gel	1 Syringe	GEL	1.0 g	TSV010S	TSV010E
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
Putty	1 Syringe	BONE PASTE	0.5 cc	HPT09S	HPT09E
Putty	1 Syringe wide tip	BONE PASTE	1.0 cc	HPT61S	HPT61E
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
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
MEMBRANES AND BARRIERS					
Evolution	1 Blister	DRIED / FINE	20x20x (0.3) mm		EV02LLE
Evolution	1 Blister	DRIED / FINE	30x30x (0.3) mm		EV03LLE
Evolution	1 Blister	DRIED / FINE	Oval 25x35x (0.3) mm		EVOLLE
Evolution	1 Blister	DRIED / STANDARD	20x20x (0.5) mm	EM02HS	EV02HHE
Evolution	1 Blister	DRIED / STANDARD	30x30x (0.5) mm	EM03HS	EV03HHE
Evolution	1 Blister	DRIED / STANDARD	Oval 25x35x (0.5) mm	EM00HS	
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 / STANDARD	30x30x (3.0) mm	LS03SS	
Semi Soft Cortical Lamina	1 Blister	DRIED / MEDIUM	20x40x (1.0) mm	LS24LS	
Curved Lamina	1 Blister	DRIED / MEDIUM	35x35x (1.0) mm	LS10HS	LS10HE
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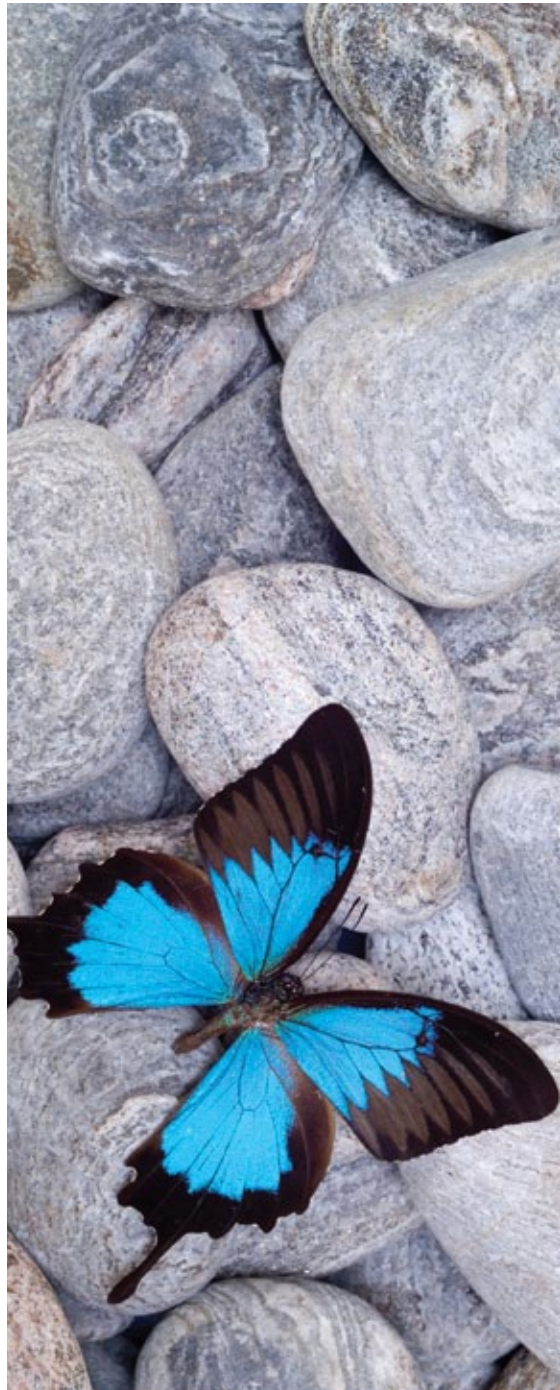
Apatos Mix	1 Vial	DRIED GRANULES	0.5 g	A1005FS	A1005FE
Apatos Mix	1 Vial	DRIED GRANULES	1.0 g	A1010FS	A1010FE
Apatos Mix	1 Vial	DRIED GRANULES	2.0 g	A1020FS	A1020FE
Apatos Cortical	1 Vial	DRIED GRANULES	0.5 g	AC1005FS	
Apatos Cortical	1 Vial	DRIED GRANULES	1.0 g	AC1010FS	
Sp-Block	1 Blister	DRIED BLOCK / 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	
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 (0.2) mm		DT020
Duo-Teck	6 Blister	DRIED FELT	25x25x (0.15) mm		DTN625
Derma	1 Blister	DRIED / FINE	12x8x (0.9) mm	ED21FS	
Derma	1 Blister	DRIED / FINE	25x25x (0.9) mm	ED25FS	
Derma	1 Blister	DRIED / STANDARD	7x5x (2.0) mm	ED75SS	
Derma	1 Blister	DRIED / STANDARD	15x5x (2.0) mm	ED15SS	
Derma	1 Blister	DRIED / STANDARD	30x30x (2.0) mm	ED03SS	



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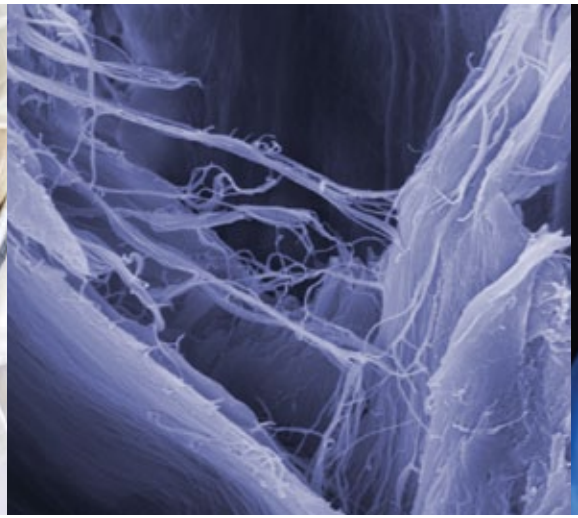

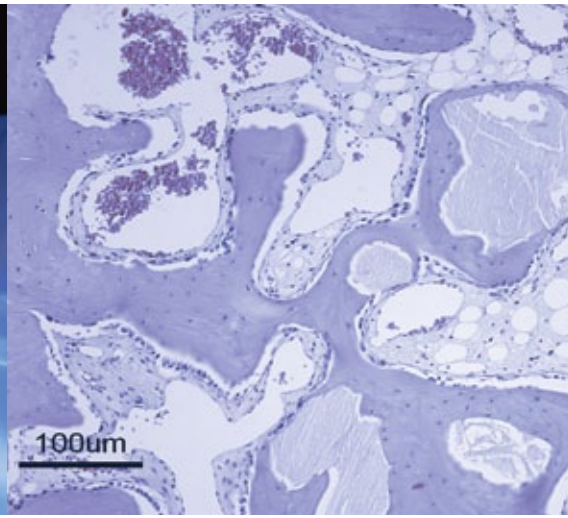

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