Synergy for Success!

Bone Grafting

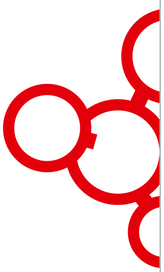
R.T.R.+

New Biphasic Formulations
ß-Tricalcium phosphate (ß-TCP)
+ Hydroxyapatite (HA)

septodont

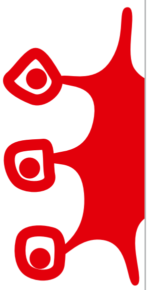
Ideal biphasic composition for bone grafting

The basic principle of R.T.R.+ composition is the appropriate balance between:



The stable hydroxyapatite (HA)

Acts as a scaffold offering an ideal structure for cellular adhesion.
Provides long term stability thanks to its slow resorption.

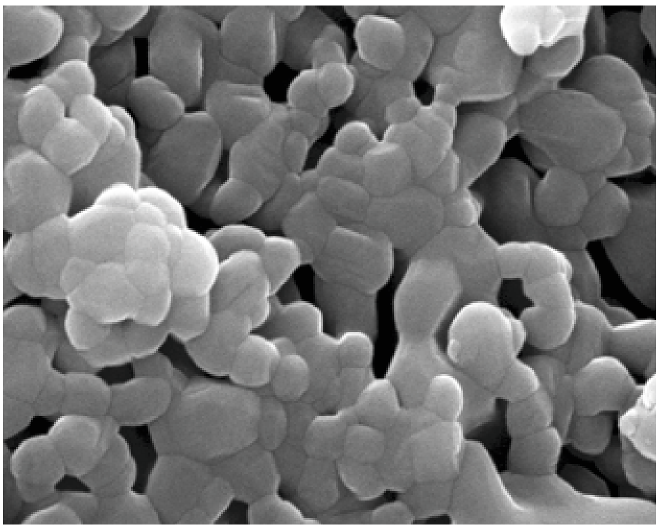


The fast resorbing ß-TCP

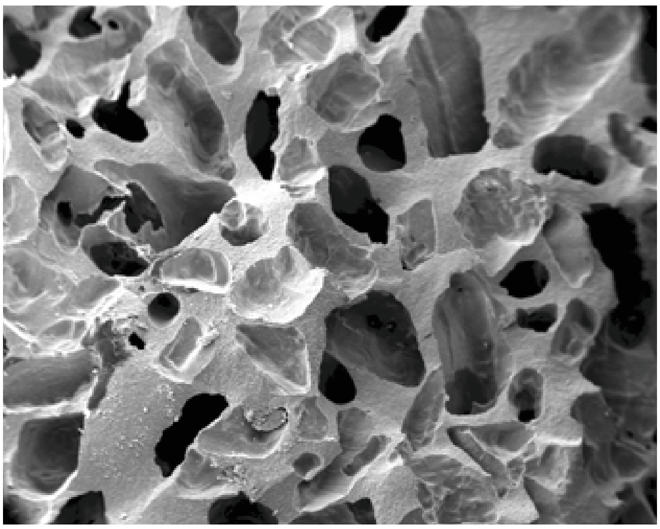
It immediately begins to release calcium and phosphate ions into micropores enhancing bioactivity.

Ideal properties thanks to MBCP® Technology*

Designed through a special manufacturing process, this micro and macroporous structure mimics human bone and is proven to be an ideal osteogenic matrix for bone regeneration [(1)].



Microporous: permeable for biological fluids



Macroporous: cell colonization and osteoconduction

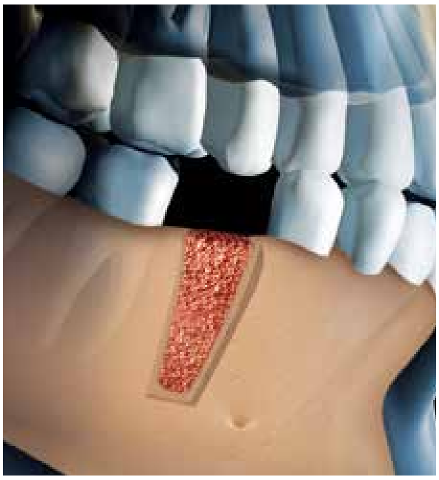
* MBCP® Technology: Micro Macroporous Biphasic Calcium Phosphate Technology
(1) Guy Daculsi, Thomas Miramond. MBCP™ Technology: Smart Alloplastic Grafts For Bone Tissue Regeneration

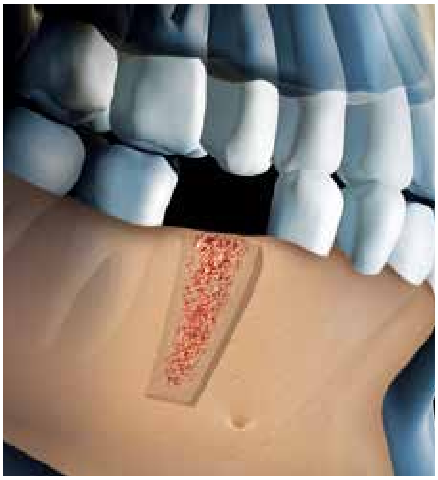
Fully synthetic

R.T.R.+ offers a high success rate with no risk associated thanks to its fully synthetic composition. Disease transmission is not an issue with synthetic material [2, 3, 4, 5].

Fully resorbable

Hydroxyapatite and ß-Tricalcium phosphate are both fully resorbable and will gradually generate new natural bone [6, 7].





(2) Ransford - 1998 - "Synthetic porous ceramic compared with autograft in scoliosis surgery 341 patient randomised study" The Journal of Bone and Joint Surgery

(3) Pascal - Mousselard - 2006 - "Anterior Cervical Fusion With PEEK Cages: Clinical Results of a Prospective, Comparative, Multicenter and Randomized Study Comparing Iliac Graft and a Macroporous Biphasic Calcium Phosphate" North American Spine Society

(4) Lavallé - 2004 - "Biphasic Ceramic wedge and plate fixation with locked adjustable screws for open wedge tibial osteotomy"

(5) Changseong - 2014 - "Eight-Year clinical follow-up of sinus grafts with Micro-Macroporous biphasic calcium phosphate granules" Key Engineering Materials

(6) R.Z LeGeros et al. - 1988 - "Significance of the Porosity and Physical Chemistry of Calcium Phosphate Ceramic Biodegradation - Bioresorption" Journal of Materials Science: Materials in Medicine

(7) Clemencia Rodriguez et al. - 2007 - "Five years clinical follow-up bone regereration with CaP Bioceramics" Key engineering materials

Two formulations

80% ß-TCP
20% Hydroxyapatite

Helps natural bone formation in a short time

40% ß-TCP
60% Hydroxyapatite

Fully respects the pace of creation of natural bone

Resorption durations*

R.T.R.+ 80/20

3 months | 6 months | 9 months | 12 months

R.T.R.+ 40/60

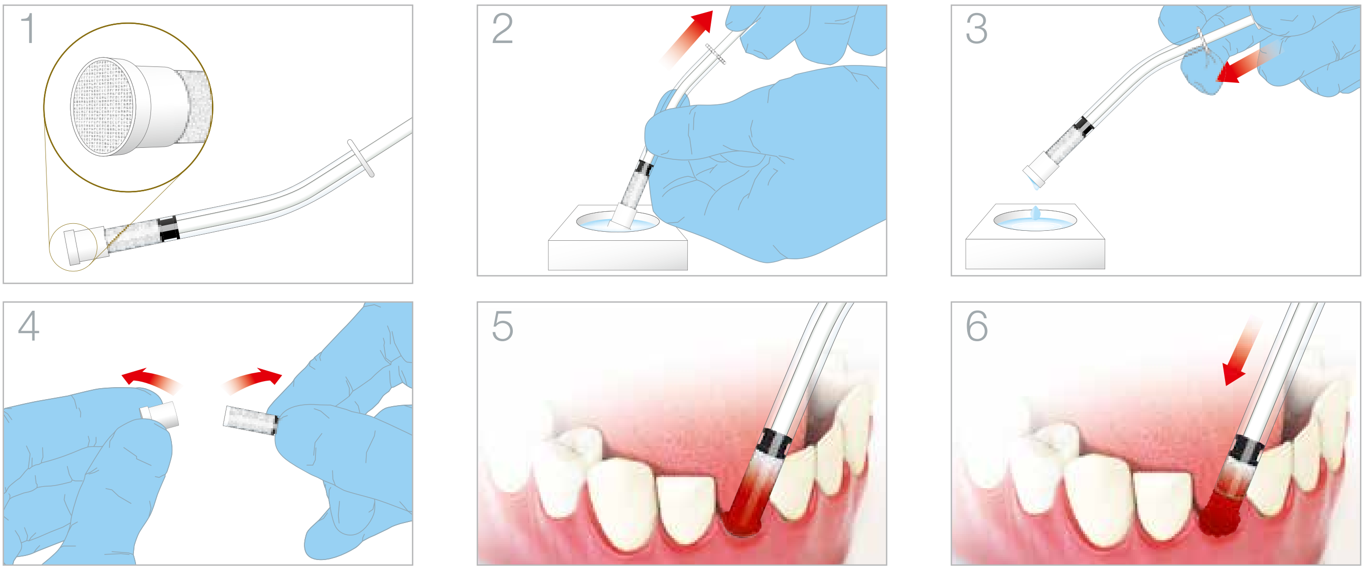
Indications

- ✔ Post-extraction socket preservation
- ✔ Periodontal defects
- ✔ Infrabony defects
- ✔ Peri-implant defects
- ✔ Sinus lift
- ✔ Ridge augmentation
- ✔ Cystic cavities

*expected resorption durations depending on the surgical indication and the patient's health status

One presentation

How to use



Technical Specifications

Granule size	0,5-1 mm
Global Porosity of 70%	Interconnected network of macropores and micropores that enables the colonisation of bone cells and biological fluid uniformly within the matrix
Macroporosity 300-600 µm average	Interconnected spaces that promote the biological infiltration and cellular colonisation by osteoblasts and osteoclasts
Microporosity <10 µm	Micropores are the intercrystalline spaces where dissolution and recrystallisation occurs
Osteoconductive	Provides a matrix for new bone growth
Bioactive	For ionic exchange: ß-TCP dissolution and bone crystal precipitation create newly bioactive interface with bone cells
Sterilization	Irradiation
Shelf life	5 years

Case Study 1: Post-extraction bone filling before implant placement

Dr Bruno Salsou - Toulon

A 55-year-old patient presented with significant mobility in tooth 36.
A retro-alveolar radiographic examination showed a level 3 furcation defect preventing the preservation of the tooth.

Pre-operative examination
Furcation defect in tooth 36.

Treatment decision

The decision was made to extract the tooth and perform bone filling so as to permit implant placement.

Operating procedure

Clinical presentation.

Fractured tooth extracted.

Post-extraction alveolus.

Syringe with R.T.R.+/MBCP® Technology filling material, 0.5-1 mm diameter granules.

R.T.R.+ /MBCP® Technology filling material saturated with blood.

Alveolus 36 filled with R.T.R.+/ MBCP® Technology.

Protection of the graft with PRF membranes.

Repositioning of flap and suture with 3-0 silk.

6 month follow-up: Radiography shows significant bone gain. Implant placement can now be considered under optimal conditions.

Conclusion/practitioner's comments

- The packaging of R.T.R.+/MBCP® Technology in pre-filled syringes facilitates the handling and placement of the material.
- The conglomerate formed with clotted blood helps to ensure the retention of the material within the alveolus, an essential element for good bone healing.

Case Study 2: Sinus filling for implant placement

Dr Bruno Salsou - Toulon

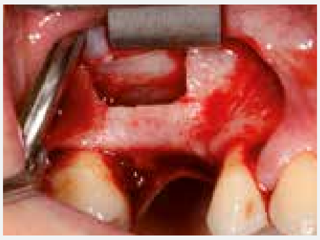
As a result of caries problems, a 25-year-old patient lost teeth 15 and 16.
A retroalveolar radiographic examination showed large sinus volume, which in such condition would prevent the placement of implants to replace the missing teeth.

Pre-operative examination
Radiographic examination showing large sinus volume.

Treatment decision

The decision was therefore made to perform a sinus lift.

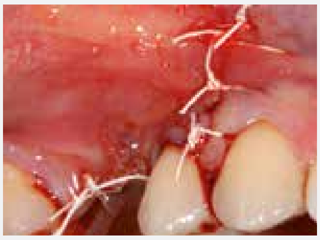
Operating procedure



Opening of bone flap with piezosurgery.

Placement of 1-2 mm diameter granules of R.T.R.+/MBCP® Technology filling material using the delivery syringe.

Sinus filling completed.



Repositioning the flap to close off the site tightly. Suturing the area. End of operation.

Immediate post-operative check: Panoramic radiographic examination showing the bone gain obtained following the sinus-lift in sector 1.

6 month follow-up: Placement implants, 4.1mm in diameter and 10mm in length.

Conclusion/practitioner's comments

- The highly granular consistency of the material permits easier placement and prevents the dispersion of the R.T.R.+/MBCP® Technology granules.
- The stability of the material also optimises bone healing.

References

+30 years of clinical follow-up

Authors	Title	Journal	Year
Guy Daculsi, Thomas Miramond	MBCP™ Technology: Smart Alloplastic Grafts For Bone Tissue Regeneration	-	-
Guy Daculsi	Smart scaffolds: the future of bioceramic	Journal of Materials Science: Materials in Medicine	2015
R.Z. LeGeros et al.	Biphasic calcium phosphate bioceramics: preparation, properties and applications	Journal of Materials Science: Materials in Medicine	2003
R.Z. LeGeros et al.	Significance of the Porosity and Physical Chemistry of Calcium Phosphate Ceramic - Biodegradation-Bioresorption	Journal of Materials Science: Materials in Medicine	1988
Cyril d'Arros, Thierry Rouillon, Joelle Veziers, Olivier Malard, Pascal Borget, Guy Daculsi	Bioactivity of Biphasic Calcium Phosphate Granules, the Control of a Needle-Like Apatite Layer Formation for Further Medical Device Developments	Frontiers in Bioengineering and Biotechnology	2020
G. Daculsi et al.	Performance for bone ingrowth of Biphasic calcium phosphate ceramic versus Bovine bone substitute	Key Engineering Materials	2006
N. Mailhac, G. Daculsi	Bone Ingrowth for Sinus Lift Augmentation with Micro Macroporous Biphasic Calcium Human Cases Evaluation Using MicroCT and Histomorphometry	Key Engineering Materials	2008
Clemencia Rodríguez, Alain Jean, Sylvia Mitja and Guy Daculsi	Five Years Clinical Follow up Bone Regeneration with CaP Bioceramics	Key Engineering Materials	2007
K. Changseong, K. Sung Cho, C. Daculsi G., E. Seris, G. Daculsi	Eight-Year Clinical Follow-Up of Sinus Grafts with Micro-Macroporous Biphasic Calcium Phosphate Granules	Key Engineering Materials	2014
Lee JH, Jung UW, Kim CS, Choi SH, Cho KS	Histologic and clinical evaluation for maxillary sinus augmentation using macroporous biphasic calcium phosphate in human	Clinical Oral Implants Research	2008

Presentation

Available in:

R.T.R.+ 80/20: 80% ß-TCP
20% Hydroxyapatite

R.T.R.+ 40/60: 40% ß-TCP
60% Hydroxyapatite

Please visit our website for more information:
www.septodont.co.uk

septodont