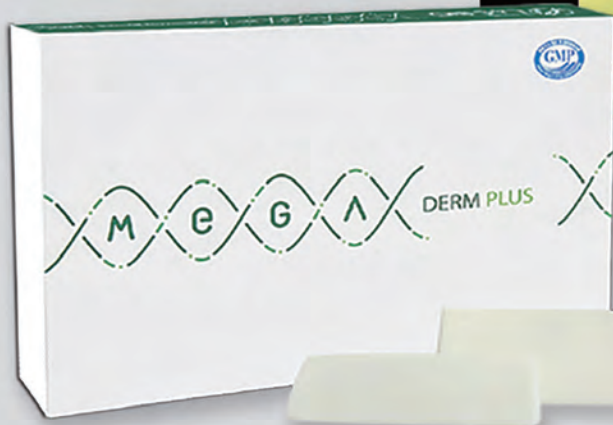


# COWELL REGENERATIVE SOLUTION

Inspire confidence through a comprehensive approach

## • Mega Derm Plus

An acellular dermal matrix that resists resorption much longer than collagen membranes as the world's first basement membrane layer removed matrix to maximize the transplant engraftment rate.



## • InnoGraft B

A xenograft composed of 100% bovine cancellous bone with 3-Dimensional structures that allow optimal cell attachment and blood penetration.



## • INNO Oss Allo

An allograft composed of 50% cortical bone and 50% cancellous bone made of FDDBA whose efficacy and safety have been verified with the highest pharmacological standard of AATB.



## • COWELL BMP

The WORLD'S FIRST E.rhBMP-2-based bone graft material that induces bone and cartilage formation as a retinoid mediator that plays a key role in osteoblast differentiation.



# COWELL REGENERATIVE SOLUTION

## INNO CaP

An osteoconductive resorbable synthetic bone graft material composed of 100% calcium phosphate to be progressively replaced by normal-structured bone in the healing period.

## INNO GF Kit

Same as COWELL BMP, but provided as a kit with separate E.rhBMP-2 and DCP vials, saline, and syringe.



## PTFE-Mesh

A cost-effective, non-resorbable PTFE barrier membrane to be applied over intraoral defects, especially tooth extraction and bone-augmented sites. As it is pre-sterilized, no more sterilization is required.

## Wifi-Mesh

A non-resorbable barrier membrane reinforced with Wifi symbol-shaped titanium frame between PTFE layers of which efficacy and safety have been proven through numerous clinical trials and registered in CE, TGA, MFDS, etc.

# COWELL BMP

## Osteoinductive Bone Graft rhBMP-2 + BCP/DCP



The world's first E.rhBMP-2 (E.Coli derived Recombinant Human Bone Morphogenetic Protein type 2), as a growth factor that induces bone and cartilage formation. It is a retinoid mediator that plays a key role in osteoblast differentiation.

### Composition

---

- COWELL BMP is bone graft material based on the E.rhBMP-2, developed for the first time in the world. It is supported by 10 years of clinical data and over 40 studies.
- BCP/DCP as a carrier allows maintenance of space.

### Features

---

- Primary closure for soft tissue regeneration is not required.
- Regenerates adherent gingiva.
- Simplifies challenging bone grafting and soft tissue regeneration.
- Acts directly on stem cells.
- Induces bone regeneration without infection in extraction socket.
- Contains 1mg of bone morphogenic protein per 1g of the particle (1g of autologous bone contains 2ng of bone morphogenic protein).

Experience innovation

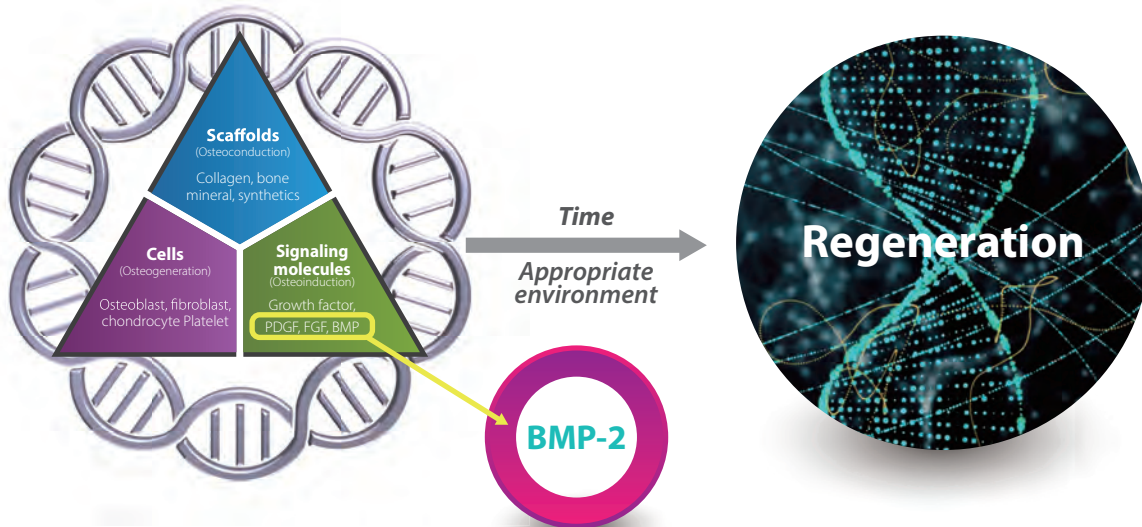
# COWELL BMP



**THE WORLD FIRST** E.rhBMP-2-based bone graft, supported by  
**10 YEARS OF CLINICAL DATA AND 40+ STUDIES.**

# Development Background

## Triad of Tissue Engineering



### Autologous stem cell transplantation

- Less effective due to difficulty of the engraftment in early stage of tissue regeneration
- Cell cultivation causes enormous expense

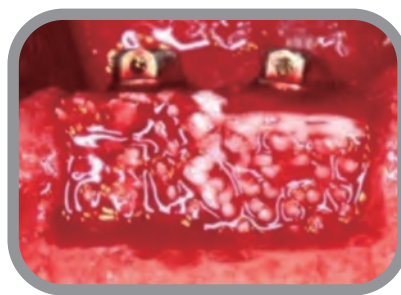
### However, Stem cell growth factors

- Effective in tissue regeneration for all vertebrates
- Even human growth factor is effective in both human and animals

## Stem cell transplantation VS rhBMP-2



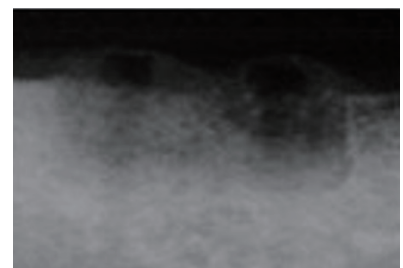
Stem cell transplantation



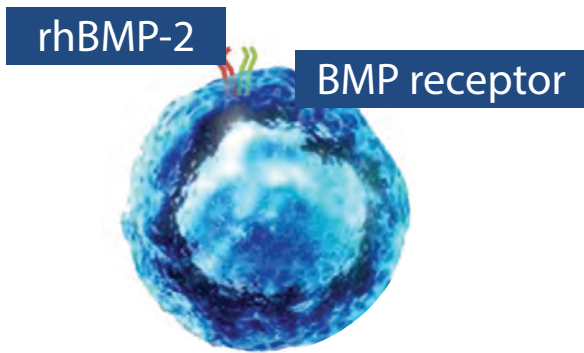
Stem cell & rhBMP-2



rhBMP-2

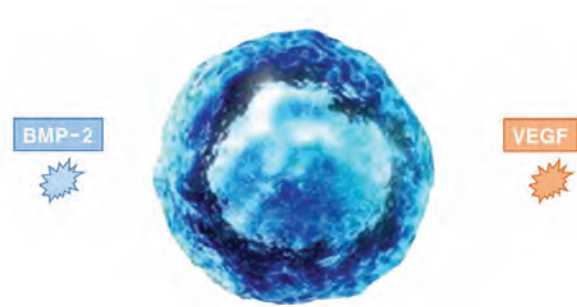


# Mechanism of Action of COWELL BMP



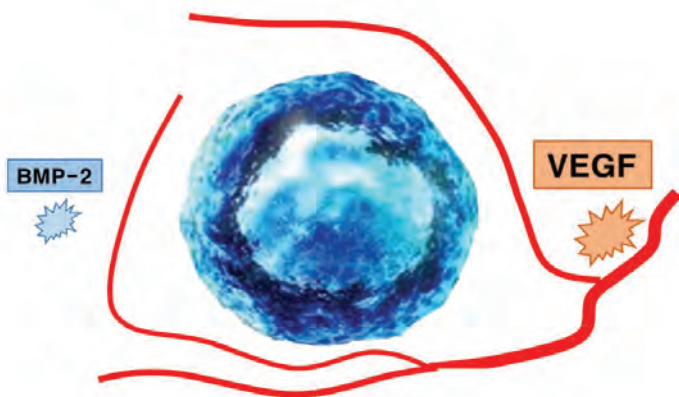
Mesenchymal Stem cell

1. rhBMP-2 bonds with BMP-2 receptor of Stem cell to **activate intracellular phosphorylating enzyme.**

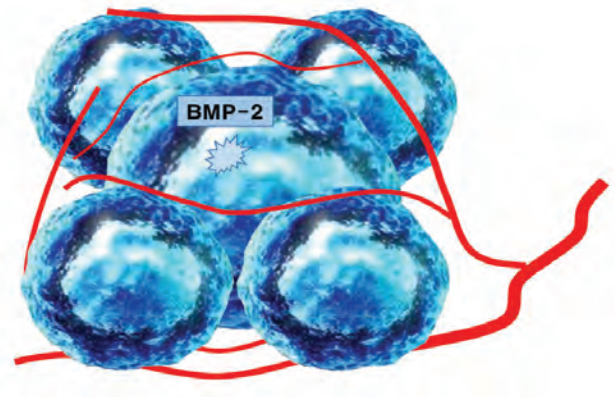


2. BMP-2 of Stem cell and VEGF activates for **protein synthesis and secretion.**

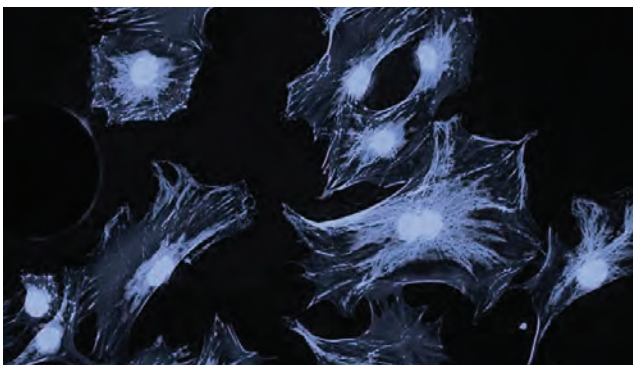
\* VEGF : Vascular Endothelial Growth Factor



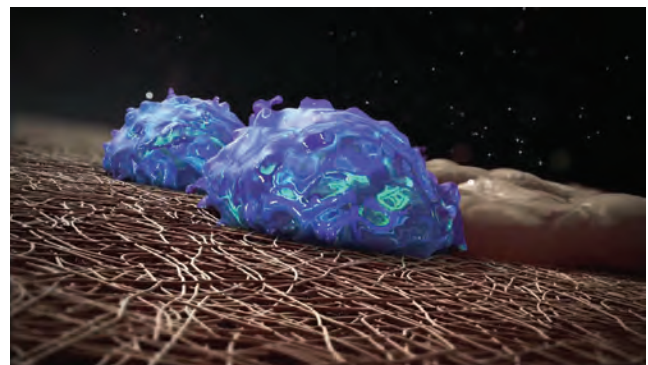
3. VEGF **promotes cell growth** by inducing angiogenesis to nourish Stem cell.



4. BMP-2, activates **cell division** of surrounding Stem cell and promotes rapid proliferation.



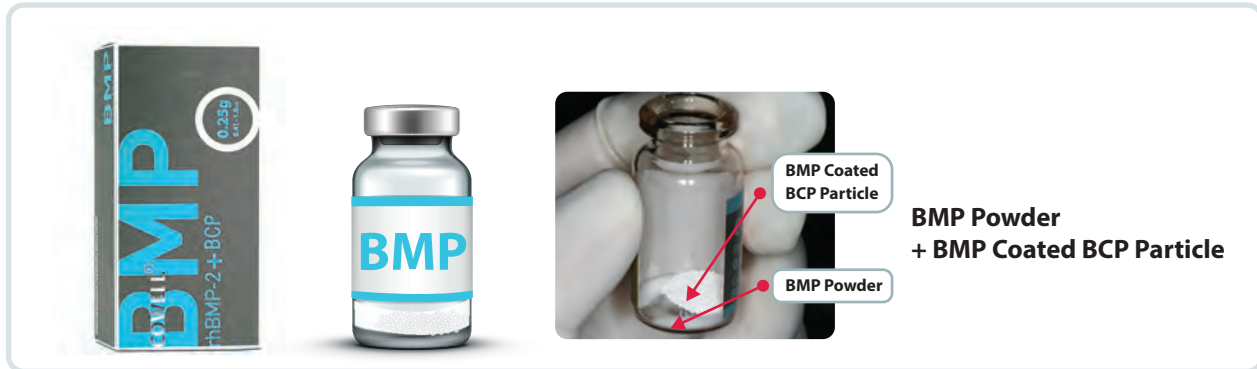
5. Proliferated Stem cells, **differentiate into various cells** according to surrounding tissues.



6. Differentiated cells **form neoplastic tissues** and remodel them according to the surrounding environment.

# Product Type

## COWELL BMP (One vial)



- Dose and particle size of the COWELL BMP



| Product Code | Particle Size |
|--------------|---------------|
| BB1010       | 0.41~1.0mm    |



| Product Code | Particle Size |
|--------------|---------------|
| BB1025       | 0.41~1.0mm    |

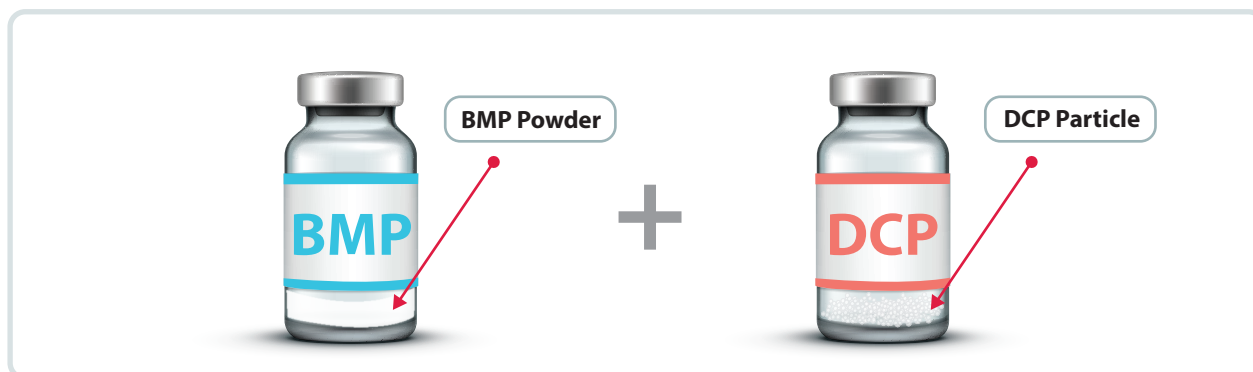


| Product Code | Particle Size |
|--------------|---------------|
| BB1050       | 0.41~1.0mm    |

\* A vial of 0.1g can be used for less than one extraction socket, while 0.25g/0.5g can be used for maxillary sinus or for the wide bone defect area.



## COWELL BMP Plus (Two vials)



• Dose and particle size of the COWELL BMP Plus.

**BMP 0.1mg**

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| EBB0125      | 0.1mg    | 0.25g         | 0.41~1.0mm    |
| EBB0105      | 0.1mg    | 0.5g          | 0.41~1.0mm    |
| EBB1110      | 0.1mg    | 1g            | 0.41~1.0mm    |
| EBB1220      | 0.1mg    | 2g            | 0.41~1.0mm    |

**BMP 0.25mg**

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| EBB2525      | 0.25mg   | 0.25g         | 0.41~1.0mm    |
| EBB2505      | 0.25mg   | 0.5g          | 0.41~1.0mm    |
| EBB1125      | 0.25mg   | 1g            | 0.41~1.0mm    |
| EBB1225      | 0.25mg   | 2g            | 0.41~1.0mm    |

**BMP 0.5mg**

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| EBB0525      | 0.5mg    | 0.25g         | 0.41~1.0mm    |
| EBB0505      | 0.5mg    | 0.5g          | 0.41~1.0mm    |
| EBB1150      | 0.5mg    | 1g            | 0.41~1.0mm    |
| EBB1250      | 0.5mg    | 2g            | 0.41~1.0mm    |

**BMP 1mg**

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| EBB1025      | 1mg      | 0.25g         | 0.41~1.0mm    |
| EBB1050      | 1mg      | 0.5g          | 0.41~1.0mm    |
| EBB1011      | 1mg      | 1g            | 0.41~1.0mm    |
| EBB1012      | 1mg      | 2g            | 0.41~1.0mm    |

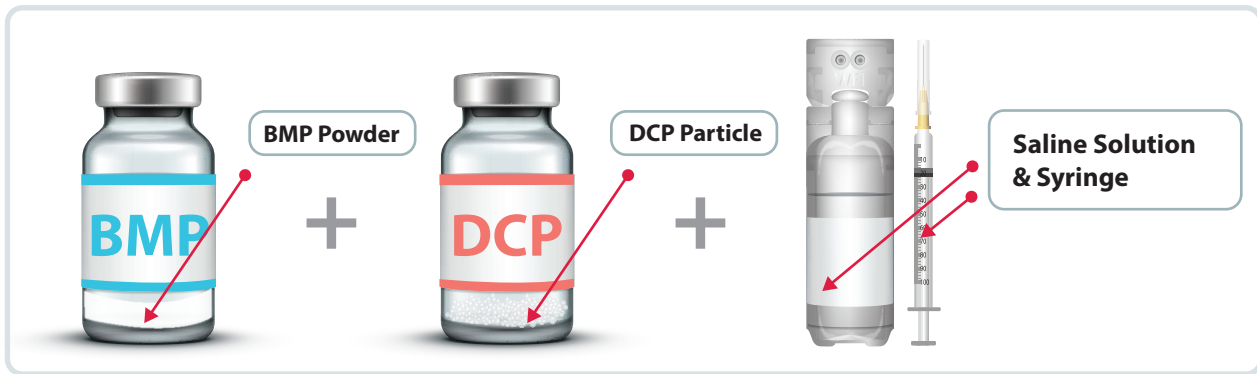
**BMP 2mg**

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| EBB2025      | 2mg      | 0.25g         | 0.41~1.0mm    |
| EBB2050      | 2mg      | 0.5g          | 0.41~1.0mm    |
| EBB2011      | 2mg      | 1g            | 0.41~1.0mm    |
| EBB2012      | 2mg      | 2g            | 0.41~1.0mm    |





## INNO GF Kit (Two vials + Saline Solution + Syringe)



• Dose and particle size of the INNO GF Kit.

### BMP 0.1mg

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| IBB0125      | 0.1mg    | 0.25g         | 0.41~1.0mm    |
| IBB0105      | 0.1mg    | 0.5g          | 0.41~1.0mm    |
| IBB1110      | 0.1mg    | 1g            | 0.41~1.0mm    |
| IBB1220      | 0.1mg    | 2g            | 0.41~1.0mm    |

### BMP 0.25mg

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| IBB2525      | 0.25mg   | 0.25g         | 0.41~1.0mm    |
| IBB2505      | 0.25mg   | 0.5g          | 0.41~1.0mm    |
| IBB1125      | 0.25mg   | 1g            | 0.41~1.0mm    |
| IBB1225      | 0.25mg   | 2g            | 0.41~1.0mm    |

### BMP 0.5mg

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| IBB0525      | 0.5mg    | 0.25g         | 0.41~1.0mm    |
| IBB0505      | 0.5mg    | 0.5g          | 0.41~1.0mm    |
| IBB1150      | 0.5mg    | 1g            | 0.41~1.0mm    |
| IBB1250      | 0.5mg    | 2g            | 0.41~1.0mm    |

### BMP 1mg

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| IBB1025      | 1mg      | 0.25g         | 0.41~1.0mm    |
| IBB1050      | 1mg      | 0.5g          | 0.41~1.0mm    |
| IBB1011      | 1mg      | 1g            | 0.41~1.0mm    |
| IBB1012      | 1mg      | 2g            | 0.41~1.0mm    |

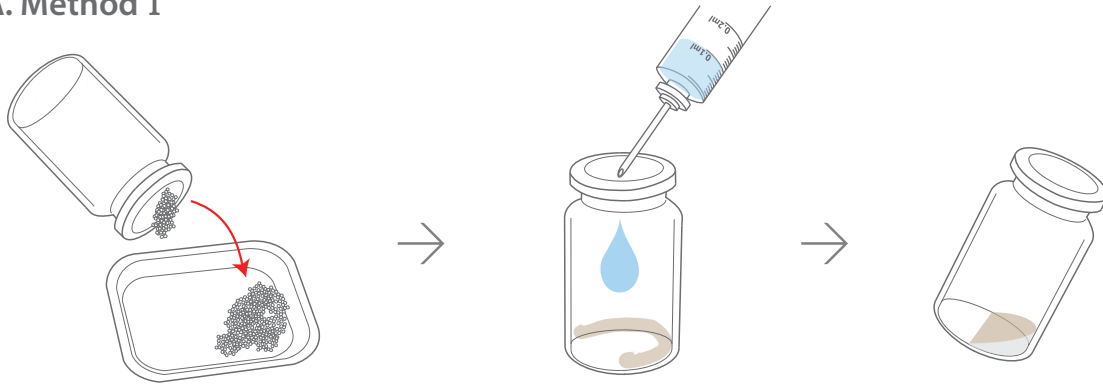
### BMP 2mg

| Product Code | BMP Dose | Particle Dose | Particle Size |
|--------------|----------|---------------|---------------|
| IBB2025      | 2mg      | 0.25g         | 0.41~1.0mm    |
| IBB2050      | 2mg      | 0.5g          | 0.41~1.0mm    |
| IBB2011      | 2mg      | 1g            | 0.41~1.0mm    |
| IBB2012      | 2mg      | 2g            | 0.41~1.0mm    |



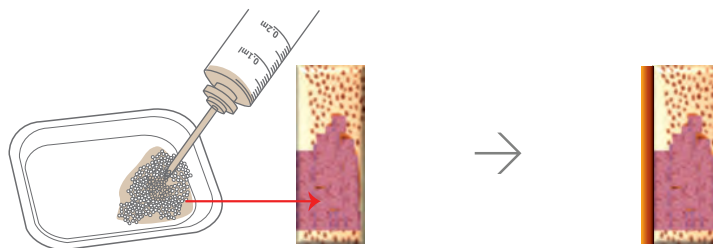
# User Guide COWELL BMP

## A. Method I



a. Transfer DCP graft material (Vial I).

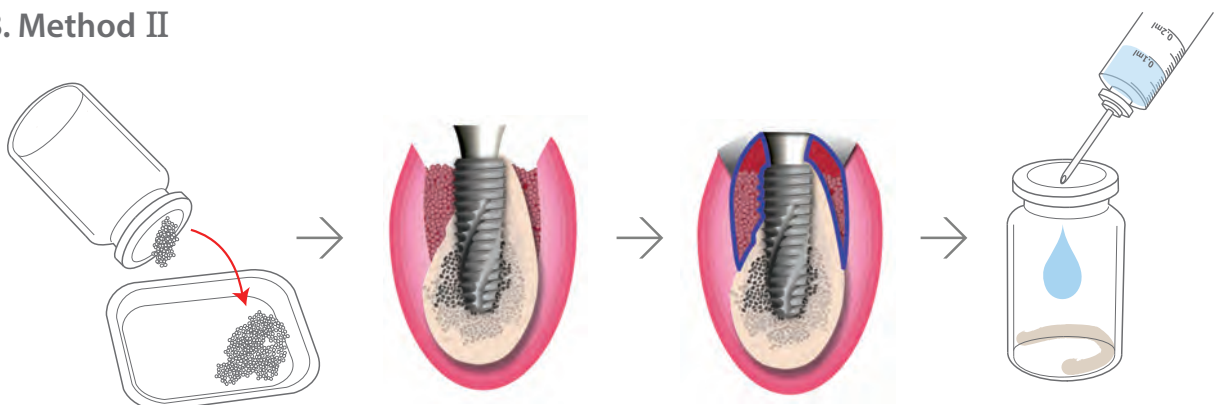
b. Inject distilled water into vial II with lyophilized rhBMP-2 powder in it and mix with the powder.



c. Mix BMP solution with DCP or plus autogenic / allograft and, apply to the recipient site.

d. Cover the defect area using a barrier membrane or suture natural soft tissue without membrane.

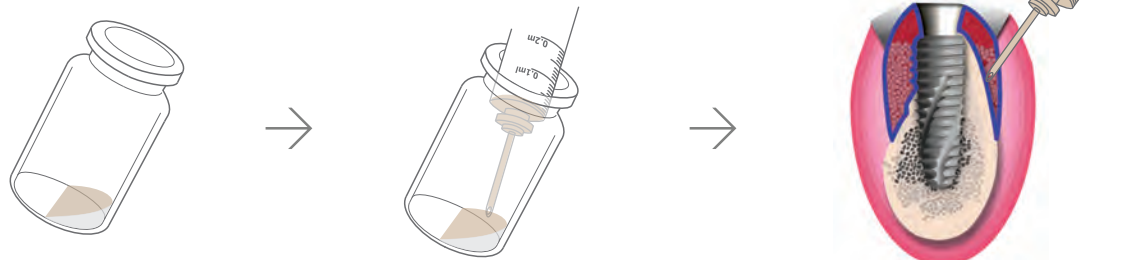
## B. Method II



a. Transfer DCP graft material (Vial I) into a container.

b. Apply DCP into the recipient site and cover the defect area using a barrier membrane or suture natural soft tissue without membrane.

c. Inject distilled water into lyophilized rhBMP-2 powder (vial II).

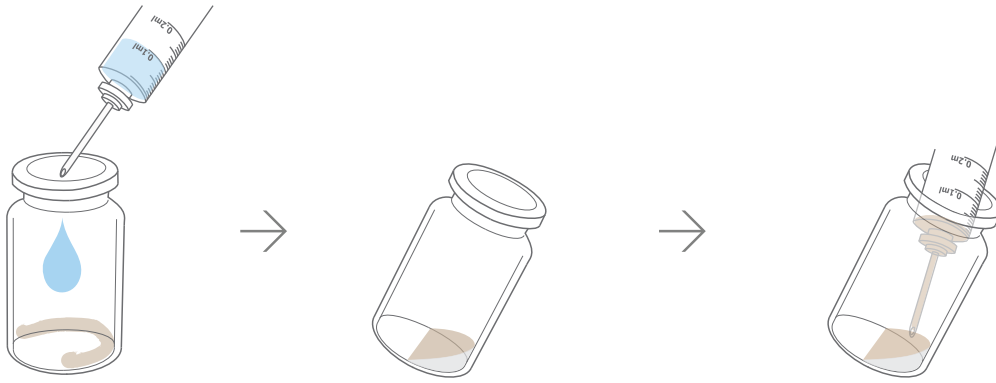


d. Mix rhBMP-2 with distilled water (saline solution) and wait for 10 to 15 seconds before using.

e. Aspirate the mixture using a syringe.

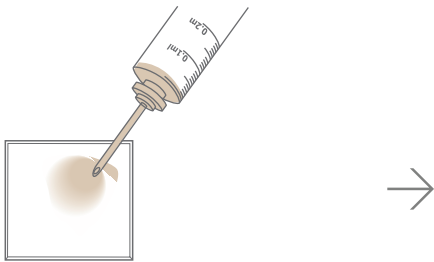
f. Inject BMP solution through soft tissue until needle of syringe reaches bone.

### C. Method III

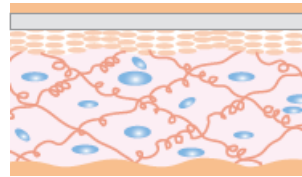


a. Inject distilled water into vial **II** with lyophilized rhBMP-2 power in it and mix with the powder.

b. Aspirate the mixture using a syringe.



c. Hydrate BMP-2 solution into membrane.



d. Apply BMP-2 solution soaked membrane to damaged site.

### Dose of distilled water to make the mixture (BMP-2 Solution)

| BMP Dose | Distilled Water Dose | BMP Dose | Distilled Water Dose |
|----------|----------------------|----------|----------------------|
| 0.1mg    | 0.1ml                | 2mg      | 1.6ml                |
| 0.25mg   | 0.2ml                | 5mg      | 4ml                  |
| 0.5mg    | 0.4ml                | 10mg     | 8ml                  |
| 1mg      | 0.8ml                | 20mg     | 16ml                 |

# Video

\* Scan above QR code to watch videos of user guide of COWELL BMP

## 1. Mixture with bone graft material

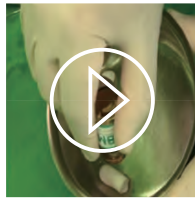
Full dose of COWELL BMP

Excess leakage of COWELL BMP

Douse bone graft material immediately before the graft to minimize the time for rhBMP-2 protein to adsorb to bone graft calcium ingredient.



Particle bone graft



Collagen Plug



Bone matrix

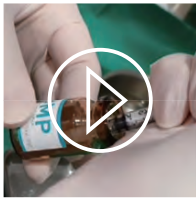


## 2. Injection into bone graft site

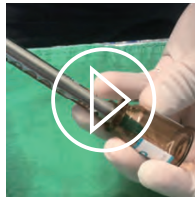
½ dose of COWELL BMP

Moderate leakage of COWELL BMP

Even if the solution leaks out of the gingival after the injection, the effect is the same since the minimum effective drug dose has reached the stem cells.



General Syringe



Lidocaine Syringe

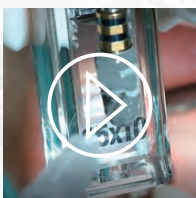


## 3. COWELL BMP coated implant

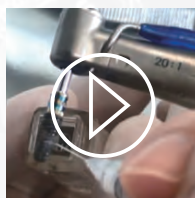
½ dose of COWELL BMP

Moderate leakage of COWELL BMP

The bone marrow stem cells are directly activated by placement of rhBMP-2 coated implant.



INNO Implant\_1



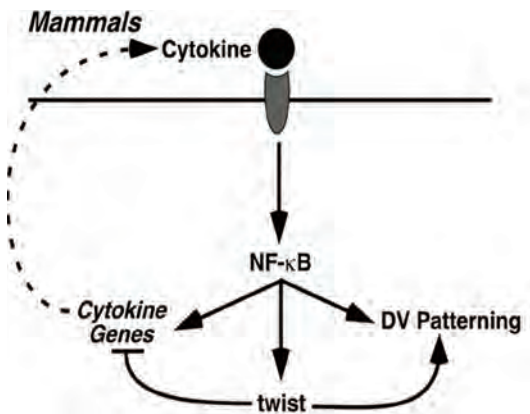
INNO Implant\_2



# Safety of COWELL BMP

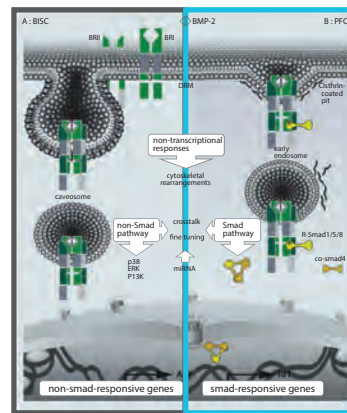
## Q : Bone overgrowth by rhBMP-2?

A : rhBMP-2 is safe from bone overgrowth because Twist-2 is synthesized in Stem cells to stop cell division when bone formation period is completed.



Cell, Vol. 112, 169-180, January 24, 2003

European Journal of Endocrinology (2000) 142 9-21

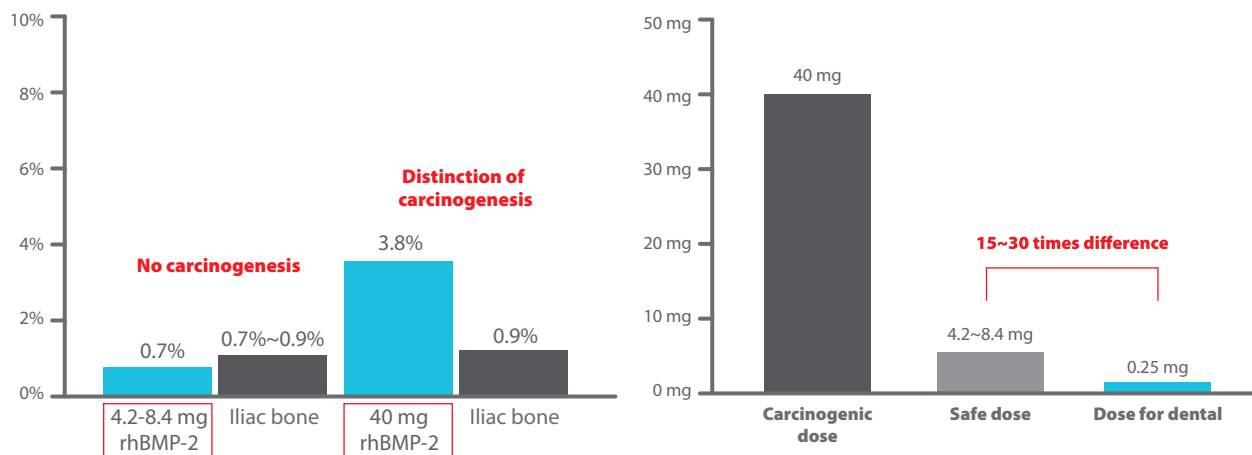


Cell proliferation **Cell differentiation**

- Bonding to BMP-2 receptor
- Signal pathway
- Nuclear activation
- **VEGF, BMP Synthesis**

## Q : Correlation between cancer incidence and usual dose of rhBMP-2?

A : Generally, rhBMP-2 may be related to cancer incidence only when total dose is over 40mg. Countless research has proven that the safety standard dose is 4.2~8.4mg. COWELL BMP is supplied below the safety standard dose only. (E.g. COWELLBMP 0.25g contains 0.25mg of rhBMP-2 which is 15 to 30 times lower than the safety standard.)



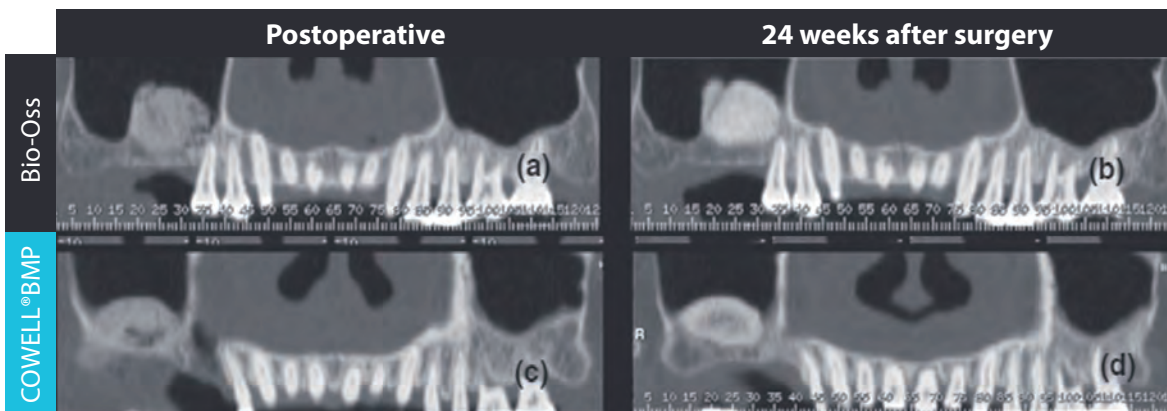
**Q : Swelling occurrence after using rhBMP-2?**

A : Relief incision may cause swelling due to angiogenesis proliferation in muscle but it is pain-free. Also, swelling is a transitional phenomenon and it is not a side effect.



**Q : Seroma occurrence after using rhBMP-2?**

A : After sinus lift surgery, excessive secretion of exudate during healing period may undertow in the grafted site of sealed maxillary sinus and develop into seroma but soon disappear. To limit the use to a maximum of 0.25 mg is safer rather than a high dose.



# Effectiveness of COWELL BMP

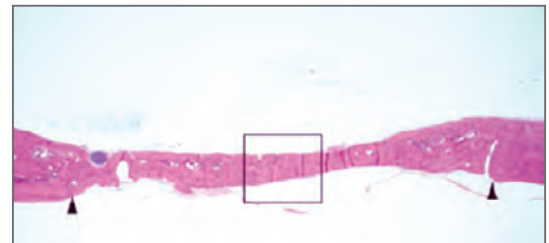
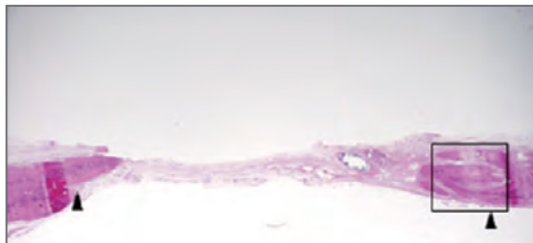
## ■ Critically Defected Model

### Bone Graft Type

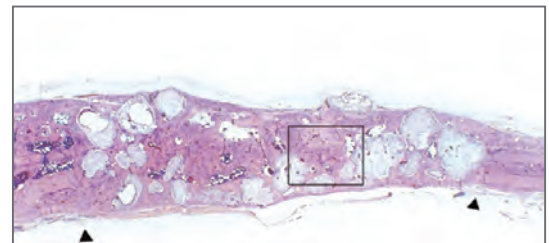
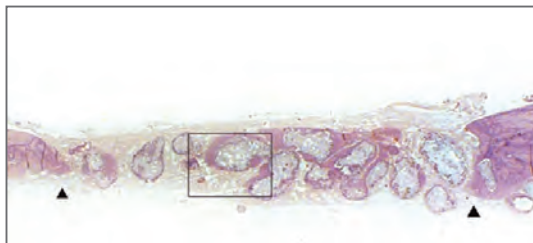
Without rhBMP-2

With rhBMP-2

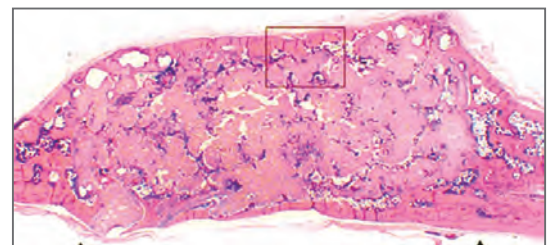
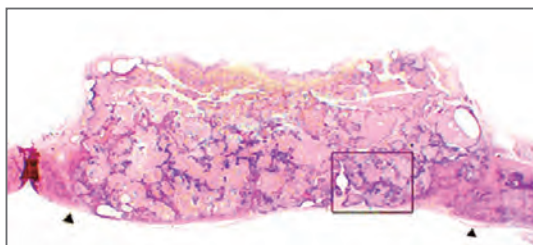
Collagen



Particle Graft

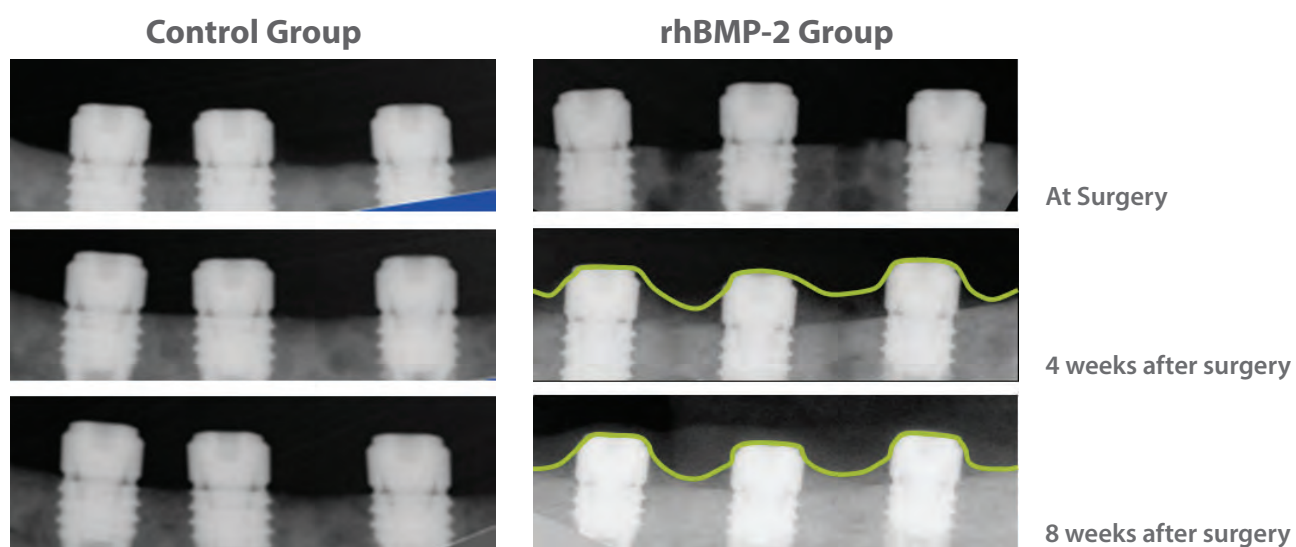


Block Graft

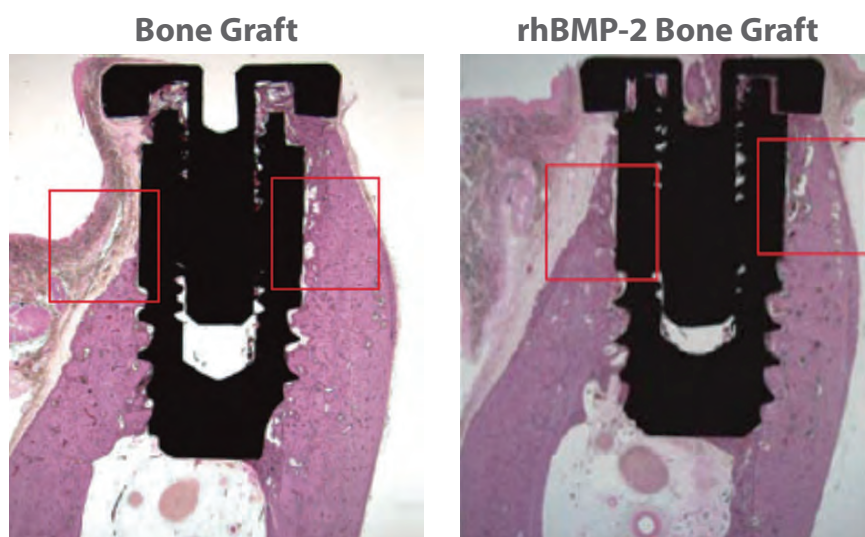


## ■ rhBMP-2 Coated Implant

### Vertical Defect



### Dehiscence Defect



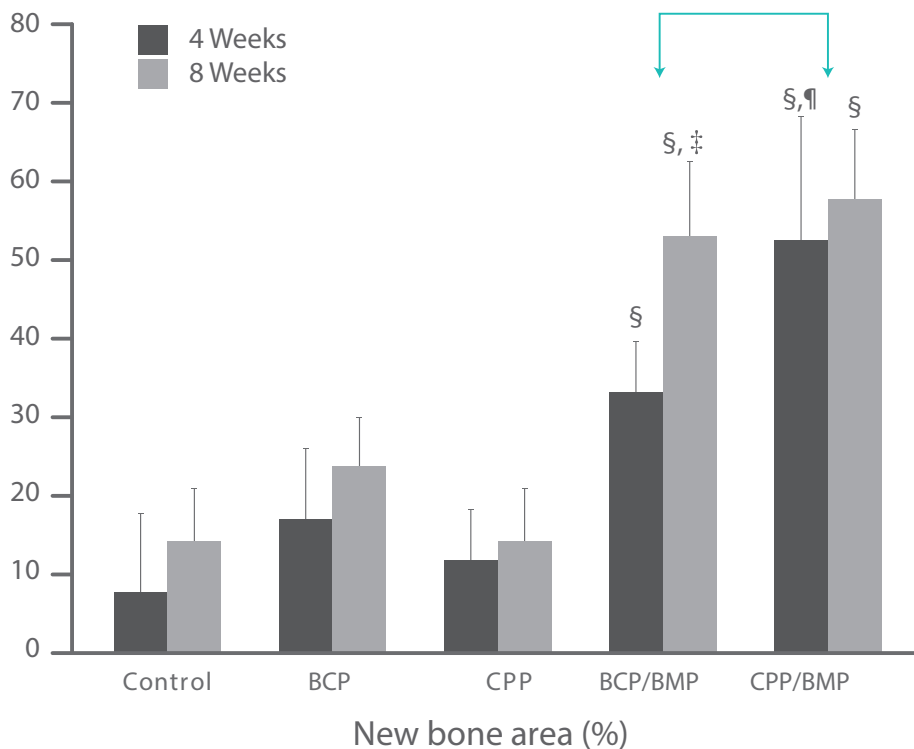
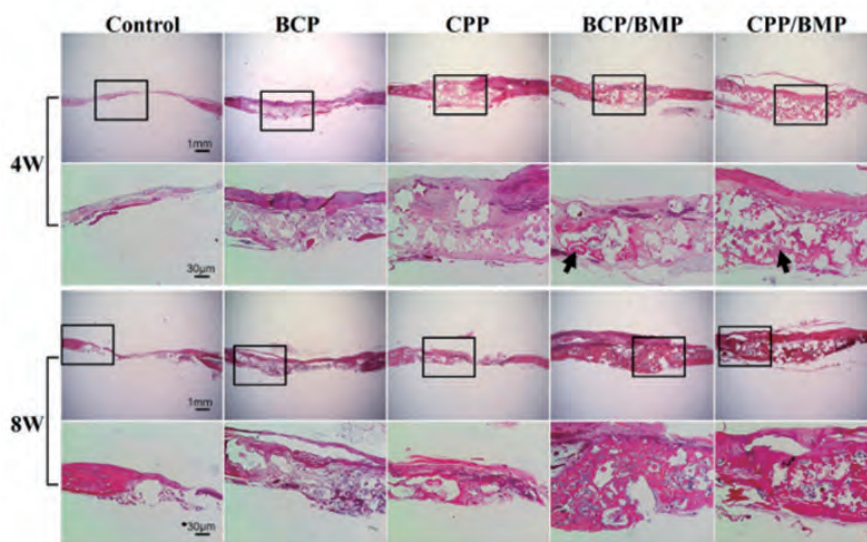
\* Bone is safely formed without barrier membrane after rhBMP-2 bone graft, however, when use of general bone graft, barrier membrane is essential



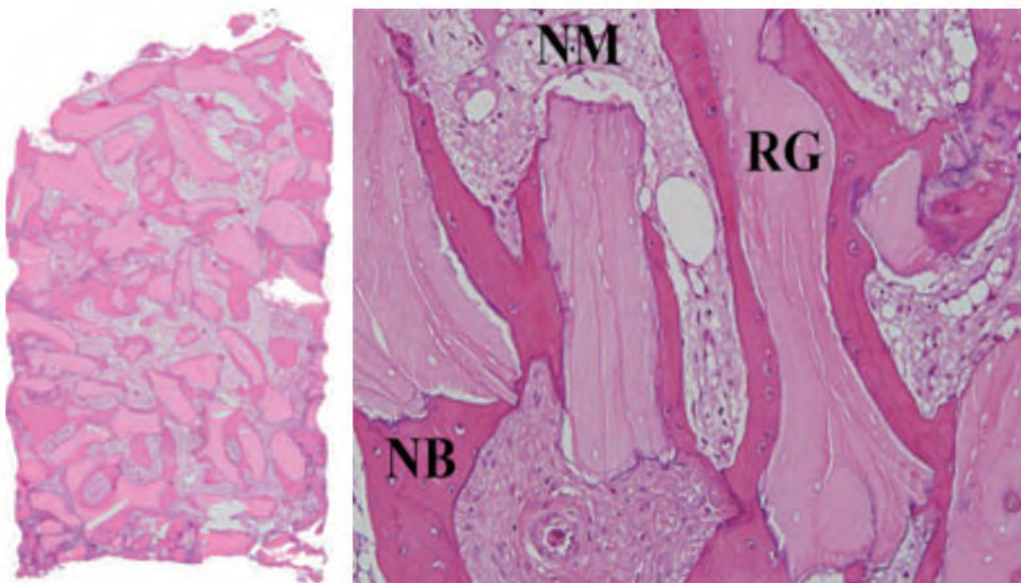
# Effectiveness of COWELL BMP

## ■ Comparison with other materials

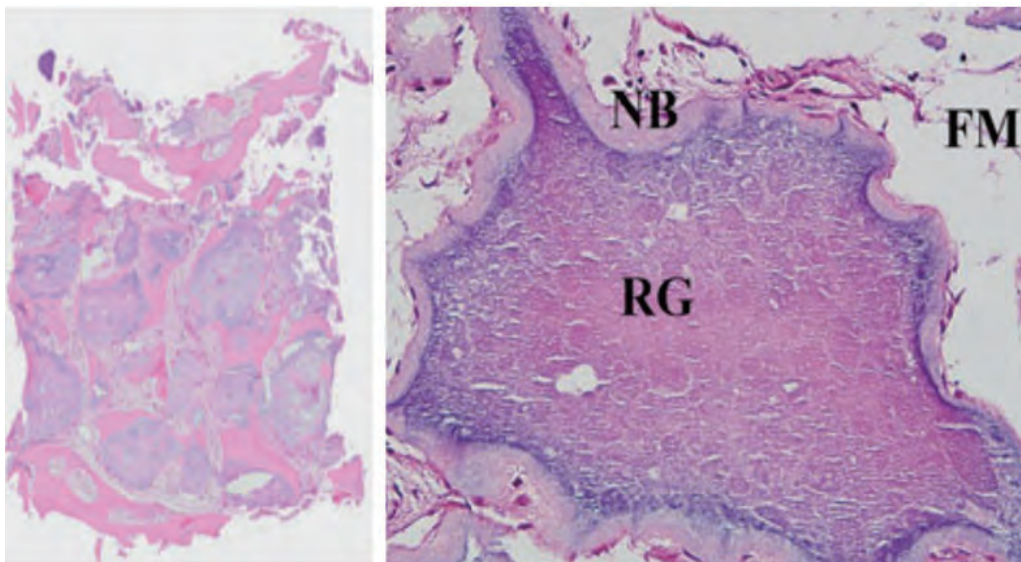
Both Calcium Pyrophosphate, CPP(Ca/P=1) and Biphasic Calcium Phosphate, BCP(Ca/P=1.55) are very effective for early osteoanagenesis. CPP, however, has higher absorption rate than BCP and is slightly more effective for osteoanagenesis.



There is no difference in the ratio of new bone generation.  
 However, Graft B forms hard fibrous tissue between particles and the COWELL BMP fills bone marrow tissue.  
 The Graft B received site has high resistance against drilling while the COWELL BMP has excellence in bone remodeling by bone.



Control ("Graft B")



COWELL BMP

# CLINICAL CASE

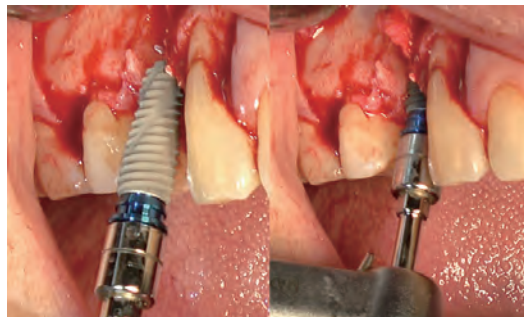
## Case 1. Bone Regeneration and Gingival Improvement Using Bone Augmentation using COWELL BMP



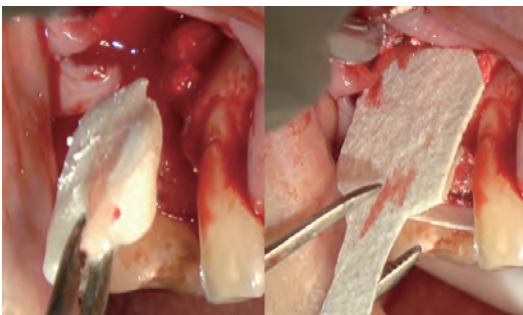
**Dr. Claudio Sotomayor Julio,**  
**D.D.S.**  
Chille



① Pre-operative



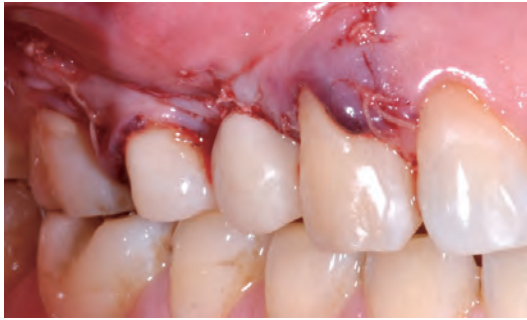
② INNO implant placement



③ 2 layers of membrane placement  
with COWELL BMP BCP powder



④ COWELL BMP injection



⑤ Post-operative



⑥ 1 month



⑦ 4 months healing period and removal of adhesive provisional tooth



⑧ 2 weeks after connection surgery



⑨ 5 months



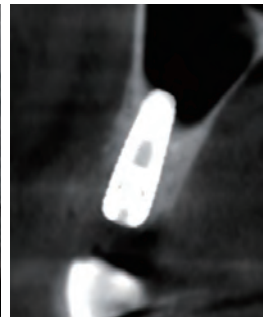
⑩ 5 month after surgery : final rehabilitation



Pre-operation  
(18.08.02)



Post-operation  
(18.08.02)



4 months  
(18.12.03)



1 year  
(19.08.06)

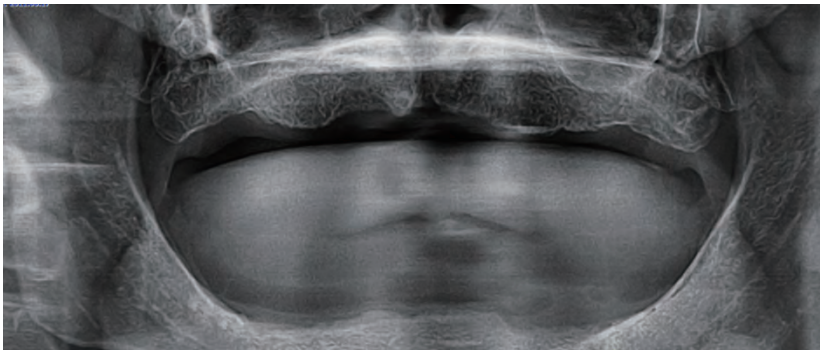
# CLINICAL CASE

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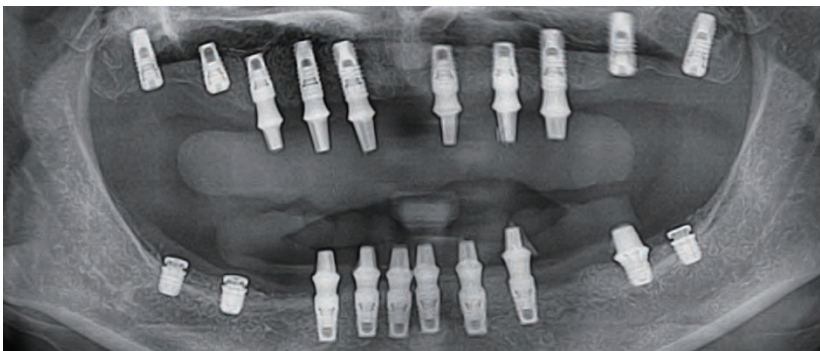
**Case 2.**  
Bone regeneration in combination of rhBMP-2 and autogenous bone

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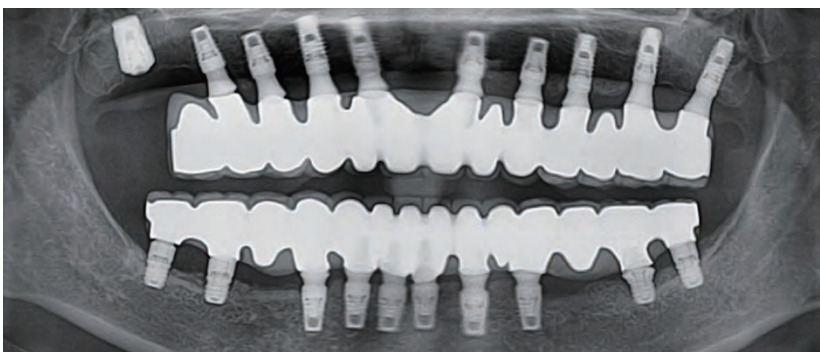
*62 years old, Female*



**Preoperative**  
2010. 04. 05



**Postoperative**  
2010. 04. 05



**10 months**  
2011. 02. 25



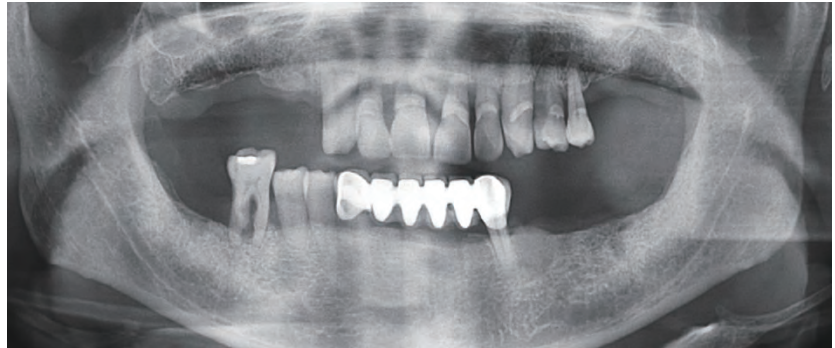
**8 years**  
2019. 01. 18

# CLINICAL CASE

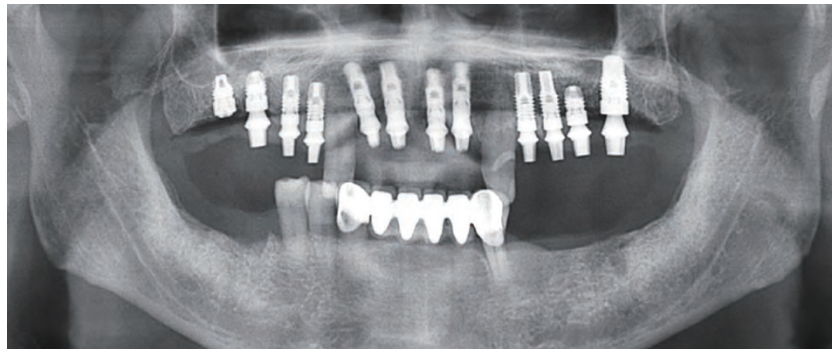
## Case 3. Staged implantation in healed ridge and extraction socket

63 years old, Male

**Preoperative**  
2010.04.06



**Postoperative**  
2010.04.30



**9 months**  
2011.01.19



**8 years**  
2019.01.08



# Scientific Proofs of COWELL BMP's Effectiveness

1. Analysis of hydrolyzable polyethylene glycol hydrogels and deproteinized bone mineral as delivery systems for glycosylated and non-glycosylated bone morphogenetic protein-2.  
*Acta Biomater.* 2012 Jan;8(1):116-23.
2. Effects of rhBMP-2 Coating Tricalcium Phosphate on Socket Preservation in Dog Extraction Socket.  
*Tissue Engineering and Regenerative Medicine*, Vol. 5, No. 4~6, pp 637-642 (2008)
3. Effects of Polycaprolactone-Tricalcium Phosphate, Recombinant Human Bone Morphogenetic Protein-2 and Dog Mesenchymal Stem Cells on Bone Formation: Pilot Study in Dogs.  
*Yonsei Med J* 50(6): 825-831,(2009)
4. The induction of bone formation in rat calvarial defects and subcutaneous tissues by recombinant human BMP-2, produced in *Escherichia coli*.  
*Biomaterials* 31 (2010) 3512–3519
5. Alveolar ridge augmentation using anodized implants coated with *Escherichia coli*-derived recombinant human bone morphogenetic protein 2.  
*Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* (2011) Jul;112(1):42-9
6. Bone formation of *Escherichia coli* expressed rhBMP-2 on absorbable collagen block in rat calvarial defects.  
*Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2011;111:298-305
7. Bone formation of block and particulated biphasic calcium phosphate lyophilized with *Escherichia coli*-derived recombinant human bone morphogenetic protein 2 in rat calvarial defects.  
*Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2011;112:298-306.
8. Induction of bone formation by *Escherichia coli*-expressed recombinant human bone morphogenetic protein-2 using block-type macroporous biphasic calcium phosphate in orthotopic and ectopic rat models.  
*J Periodontal Res.* (2011) Dec; 46(6):682-90.
9. Enhanced adipogenic differentiation and reduced collagen synthesis induced by human periodontal ligament stem cells might underlie the negative effect of recombinant human bone morphogenetic protein-2 on periodontal regeneration.  
*J Periodontal Res* (2011); 46: 193–203
10. The Effects of rhBMP-2 Injection at Distraction Osteogenesis of Rats' Tibia.  
*Tissue Engineering and Regenerative Medicine*, Vol. 8, No. 2, pp 158-163 (2011).
11. Discontinuous Release of Bone Morphogenetic Protein-2 Loaded Within Interconnected Pores of Honeycomb-Like Polycaprolactone Scaffold Promotes Bone Healing in a Large Bone Defect of Rabbit Ulna.  
*Tissue Eng Part A.* 2011 Oct;17(19-20):2389-97.v
12. The effect of immobilization of heparin and bone morphogenetic protein-2 to bovine bone substitute on osteoblast-like cell's function.  
*J Adv Prosthodont* 2011; 3:145-51
13. Multicenter, randomized clinical trial on the efficacy and safety of *Escherichia coli*-derived rhBMP-2 with  $\beta$ -Tricalcium phosphate and hydroxyapatite in human extraction sockets.  
*J Adv Prosthodont* 2011; 4:178-182
14. Effects of Anodized Implants Coated With *Escherichia coli*-Derived Recombinant Human Bone Morphogenetic Protein-2 on Osseointegration in Rabbits.  
*Tissue Engineering and Regenerative Medicine*, Vol. 8, No. 1, pp 62-68 (2011)
15. Novel analysis model for implant osseointegration using ectopic bone formation via the recombinant human bone morphogenetic protein-2/macroporous biphasic calcium phosphate block system in rats: a proof-of concept study.  
*J Periodontal Implant Sci* 2012; 42:136-143

16. Effects of anodized implants coated with Escherichia coli-derived rhBMP-2 in beagle dogs. *Int. J. Oral Maxillofac. Surg.* 2012; 41: 1577–1584.
17. Bone formation of middle ear cavity using biphasic calcium phosphate lyophilized with Escherichia coli-derived recombinant human bone morphogenetic protein 2 using animal model. *International Journal of Pediatric Otorhinolaryngology* 77 (2013) 1430–1433
18. Bone formation and remodeling of three different dental implant surfaces with Escherichia coli-derived recombinant human bone morphogenetic protein 2 in a rabbit model. *Int J Oral Maxillofac Implants.* 2013; 28(2):424-30
19. Recombinant Human Bone Morphogenetic Protein-2 Stimulates the Osteogenic Potential of the Schneiderian Membrane: A Histometric Analysis in Rabbits. *Tissue Eng Part A.* 2013 Sep;19(17-18):1994-2004
20. The effect of anodized implants coated with combined rhBMP-2 and recombinant human vascular endothelial growth factors on vertical bone regeneration in the marginal portion of the peri-implant. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2013;115:e24-e31.
21. Sinus augmentation using BMP-2 in a bovine hydroxyapatite/collagen carrier in dogs. *J Clin Periodontol* 2014; 41: 86–93.
22. Low-Dose Recombinant Human Bone Morphogenetic Protein-2 to Enhance the Osteogenic Potential of the Schneiderian Membrane in the Early Healing Phase: In Vitro and In Vivo Studies. *J Oral Maxillofac Surg* 72:1480-1494, 2014
23. Prospective randomized, controlled trial of sinus grafting using Escherichiacoli-produced rhBMP-2 with a biphasic calcium phosphate carrier compared to deproteinized bovine bone. *Clin Oral Implants Res.* 2015 Dec;26(12):1361-8.
24. Controlled release of BMP-2 using a heparin-conjugated carrier system reduces in vivo adipose tissue formation. *J Biomed Mater Res A.* 2015 Feb;103(2):545-54.
25. The efficacy of BMP-2 preloaded on bone substitute or hydrogel for bone regeneration at peri-implant defects in dogs. *Clin Oral Implants Res.* 2015 Dec;26(12):1456-65.
26. Effect of rhBMP-2 Immobilized Anorganic Bovine Bone Matrix on Bone Regeneration. *Int. J. Mol. Sci.* 2015, 16, 16034-16052.
27. Effects of rhBMP-2 on Sandblasted and Acid Etched Titanium Implant Surfaces on Bone Regeneration and Osseointegration: Spilt-Mouth Designed Pilot Study. *Biomed Res Int.* 2015; 2015:459393.
28. Comparison of collagen membrane and bone substitute as a carrier for rhBMP-2 in lateral onlay graft. *Clin Oral Implants Res.* 2015;26(1):e13-9.
29. Effects of BMP-2 Delivery in Calcium Phosphate Bone Graft Materials with Different Compositions on Bone Regeneration. *Materials* 2016, 9, 954
30. Source and Carrier Effect on the Bioactivity of BMP Bio-Implants. *Master of Science* 2013. Sylvie Di Lullo 2013, Faculty of Dentistry, University of Toronto
31. Soft and hard tissue changes when socket preservation using rhBMP-2, PRP and Non-Resorbable dPTFE membrane. *Dental implant Journal: Vol. 3, May, 2014*
32. The effect of rhBMP-2 bonegraft on infrabony defects. *Dental implant Journal: Vol. 3, May, 2014*



# INNO-CaP Calcium Phosphate , Synthetic Bone Graft

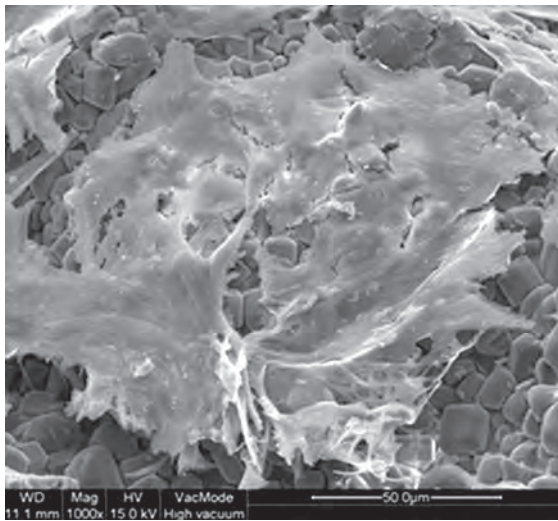
## Osteoconductive resorbable synthetic bone graft material

- INNO-CaP is an osteoconductive synthetic resorbable bone graft material consisting of Calcium Phosphate.
- INNO-CaP is completely resorbed and progressively replaced by normal-structured bone in the healing period.

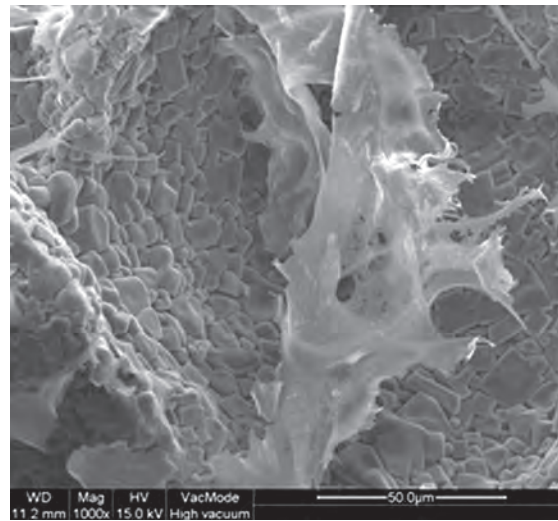
## Excellent Biocompatibility and Conductivity

- The characteristic biocompatibility and conductivity of the INNO-CaP represent the most safety.

## Cell culture SEM images (14 days)



X1,000



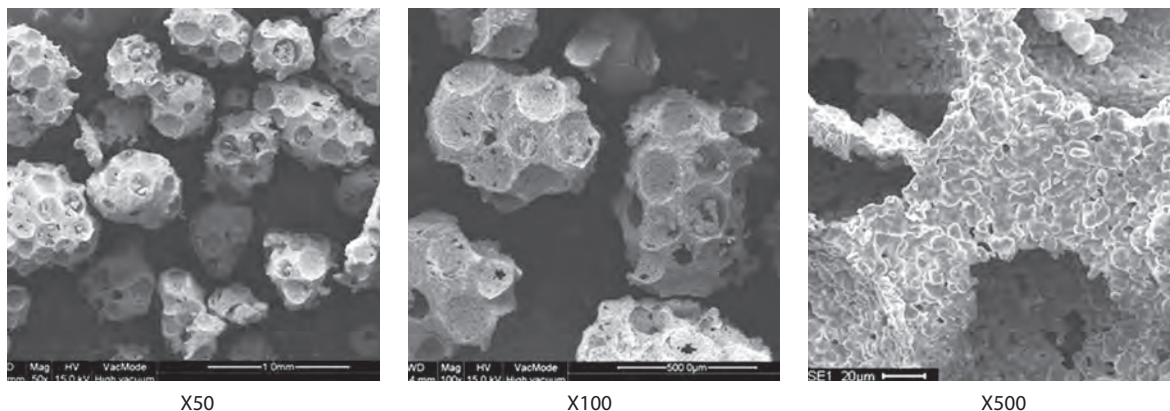
X1,000



## A porosity for new bone ingrowth

- The porosity promotes ingrowth of osteoblast, osteoclast, and growth factors.

### Particle surface SEM image



X50

X100

X500

## Indications

### Sinus graft surgery

- For sinus graft, INNO-CaP is used alone or in combination with the other graft materials.
- Healing periods residual bone height.

| residual bone height | less than 1mm                 | 2~4mm                      | more than 4 mm         |
|----------------------|-------------------------------|----------------------------|------------------------|
| implant placement    | post operation<br>9~12 months | post operation<br>6 months | simultaneous placement |

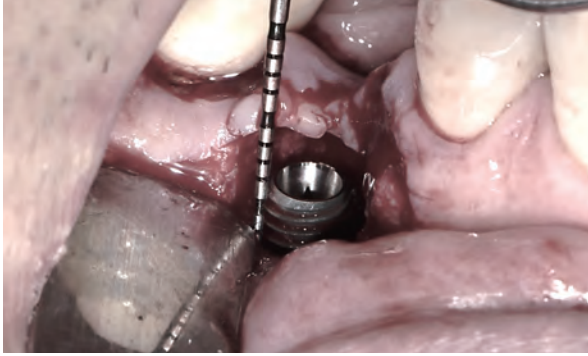
### GBR (Guided Bone Regeneration)

- Minimize the amount of autogenous bone.
- Sub-graft materials.
- Vertical and lateral augmentation.
- It is highly recommended to use with COWELL BMP.

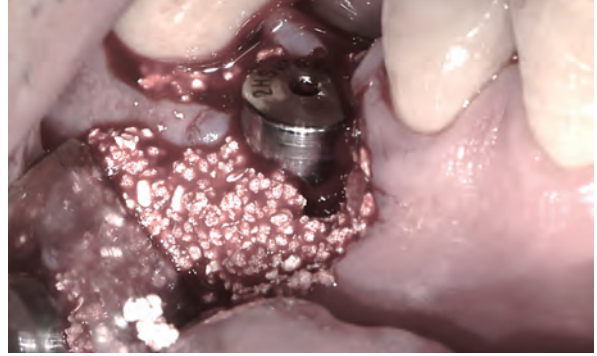
## Dose and Particle Size

| Product Code | Particle Size | Particle Dose |
|--------------|---------------|---------------|
| IG1025       | 0.4~1.0mm     | 0.25g         |
| IG1050       |               | 0.5g          |
| IG1001       |               | 1g            |
| IG1002       |               | 2g            |
| IG1425       | 1.0~1.4mm     | 0.25g         |
| IG1450       |               | 0.5g          |
| IG1401       |               | 1g            |
| IG1402       |               | 2g            |

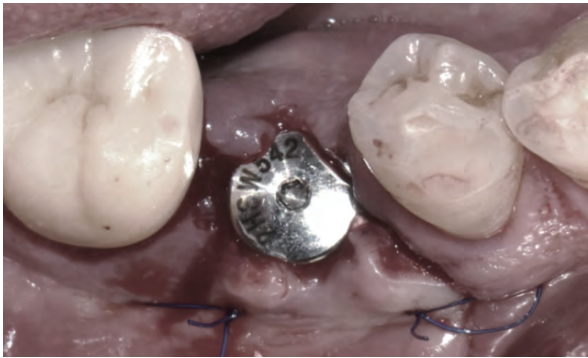
# CLINICAL CASE 1



#45 Implant placement



INNO CaP



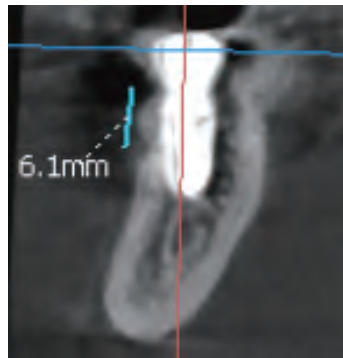
Post-OP



POD 10 weeks



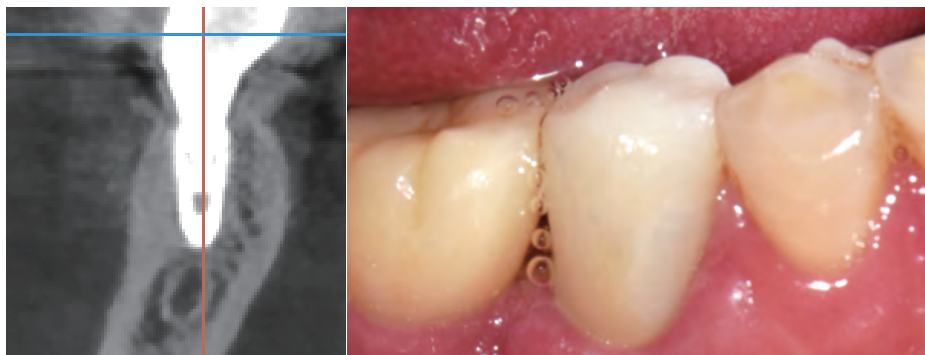
Pre-OP



Post-OP



POD 10 weeks

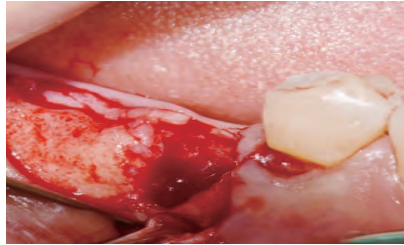


POD 1 year 6 months

# CLINICAL CASE 2



Pre-OP



Severe defect



Vertical defect



Horizontal defect



INNO CaP



MegaDerm Plus



Healing period



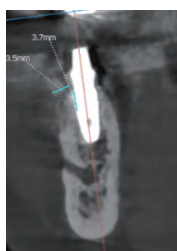
POD 11 weeks



Pre-OP CT



Post-OP CT



POD 11 weeks



POD 1 year 9 months



POD 11 weeks



POD 12 weeks



POD 1 year 9 months

# INNO OSS Allo

Allograft

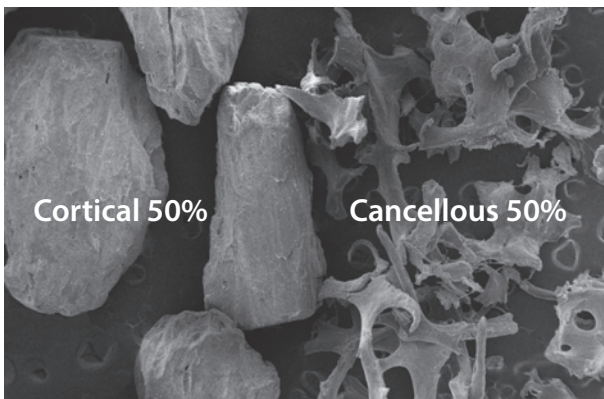
FDBA, Cortical 50% Cancellous 50%



## Product Features

- This product is made up of human tissue from trusted donors whose gender, age, and medical history were checked to ensure that their tissue could be used safely.
- It is an ideal combination of 50% cortical powder and 50% cancellous powder for bone induction.
- The 50% cortical powder maintains the space of the transplanted area during the new bone formation due to the delayed absorption rate. [\[OsteoConduction\]](#)
- 50% cancellous powder is rich in minerals and collagen that promote cell adhesion, bone remodeling, and vascular re-formation. [\[OsteoInduction\]](#)
- To prevent cross-infection by a different donor, the process is done by a single donor.
- Under the higher-level pharmacological standards (medical criteria) of the American Association of Tissue Banks (AATB), we sampled, processed, and distributed the allograft tissue.
- We recommend use of this product with the COWELL BMP.
- INNO OSS Allo is classified as a MEDICAL DEVICE.

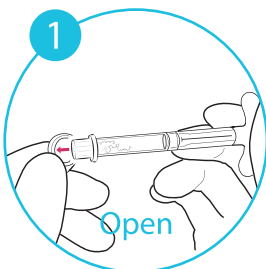
## SEM Image



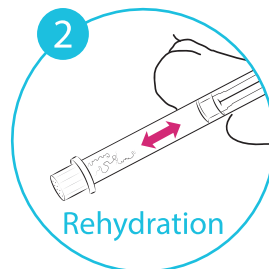
## Specifications

| Type  | Particle Size | Particle Dose |
|-------|---------------|---------------|
| OSS3A | 0.4 ~ 1.0mm   | 0.3g          |
| OSS6A | 0.4 ~ 1.0mm   | 0.6g          |

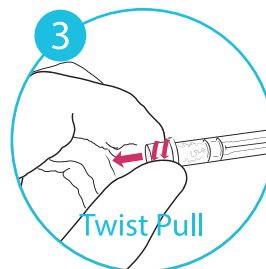
## Method of Use



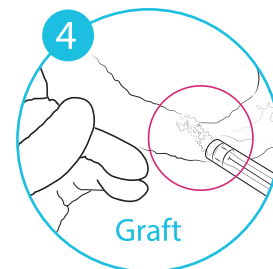
Remove the syringe's rubber cap.



Hydrate it in saline solution.



Turn and pull out the syringe cap to remove it.



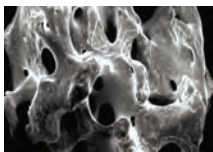
Graft it in the desired area.

# InnoGraft B

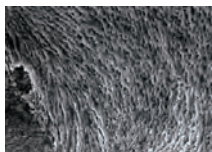
Predictable GBR Bovine Cancellous Substitute

## A Bone 100% fused to Natural Human Bone

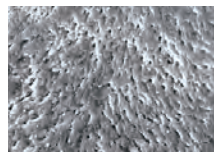
- Fast blood penetration
- Super-hydrophilicity
- 3D structure
- Fast and easy to handle
- Maximizes bone fusion
- Mutually connected porosity
- Optimal cell attachment and blood absorption
- Stimulates the activity of osteoclasts and osteoblasts



50X Magnification



1000X Magnification



1500X Magnification



Fast and Perfect Blood Permeation by Super-Hydrophilicity

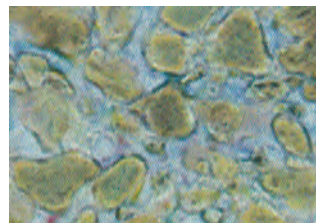


## Safe & Trustable Material

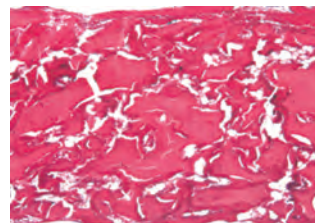
- Made of 100% bovine cancellous bone.
- Cleansing more than 30 times to completely remove organic matter.
- Firmed bone formation as highly dense.
- 100% pure HA & 99.73% of bone crystallization.



Raw material



Graft test 1



Graft test 2

(New bone formation clearly observed around grafted bone site)

## Specifications

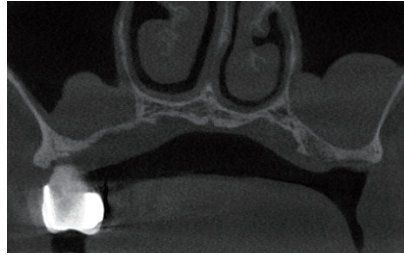
| Product Code | Partide Size | Volume |
|--------------|--------------|--------|
| IGB2015      | 0.25~1.0mm   | 0.15g  |
| IGB2025      | 0.25~1.0mm   | 0.25g  |
| IGB2050      | 0.25~1.0mm   | 0.5g   |
| IGB2100      | 0.25~1.0mm   | 1g     |

# CLINICAL CASE 1

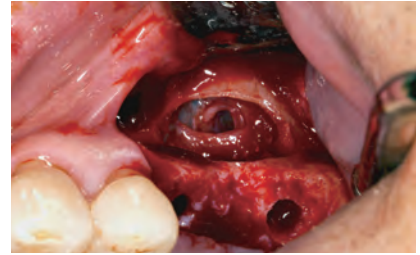
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**Fig 01.** Preoperative radiograph.



**Fig 02.** Preoperative CBCT image. Sinusitis in bone sinus cavities.



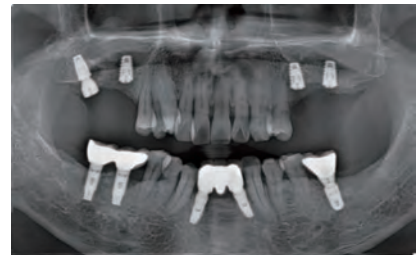
**Fig 03.** Incision and flap elevation. Removal of granulation tissue.



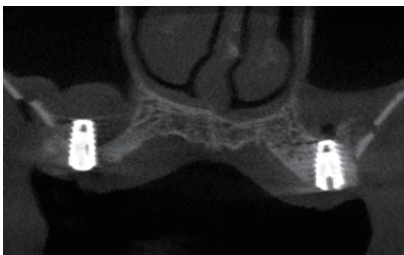
**Fig 04.** Suction of pus from the sinus.



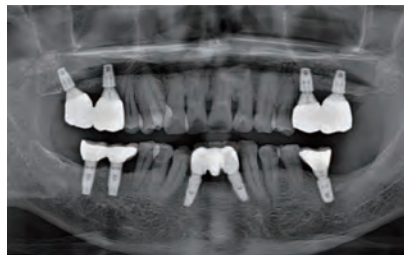
**Fig 05.** Bone grafting with InnoOss B. Resorbable membrane application.



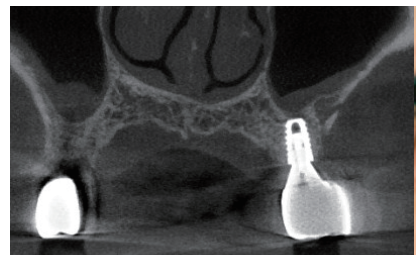
**Fig 06.** Postoperative radiograph.



**Fig 07.** Preoperative CBCT image.



**Fig 08.** Postoperative radiograph at week 6. Final restoration delivery.

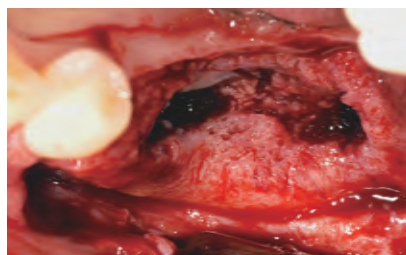


**Fig 09.** CBCT image of postoperative 10 month.

# CLINICAL CASE 2



**Fig 01.** Preoperative radiograph. 3 months after extraction in lower left posterior.



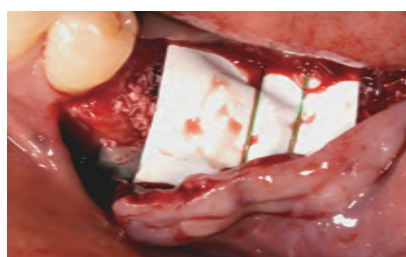
**Fig 02.** Incision and flap elevation.



**Fig 03.** Implant placement on #35, 37.



**Fig 04.** Bone grafting with InnoOss B and InnoOss Allo.



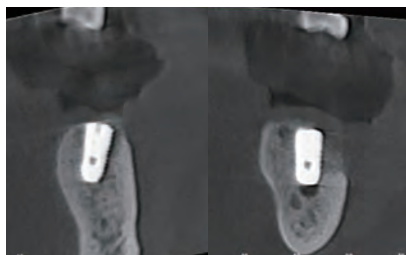
**Fig 05.** Non-resorbable membrane application.



**Fig 06.** Suture.



**Fig 07.** Postoperative radiograph.



**Fig 08.** Postoperative CBCT image of #35(Lt), #37(Rt).



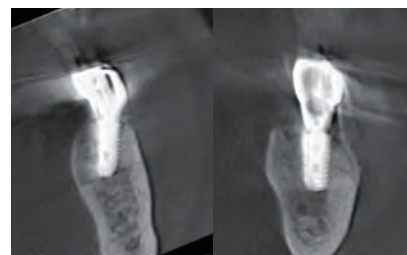
**Fig 09.** Clinical view of postoperative 2 weeks.



**Fig 10.** Clinical view of postoperative 4 months. Final restoration delivery.



**Fig 11.** Radiograph of postoperative 4 months.



**Fig 12.** 4 month postoperative CBCT image of #35(Lt), #37(Rt).



# MEGA DERM PLUS Acellular Dermal Matrix

## Product Features

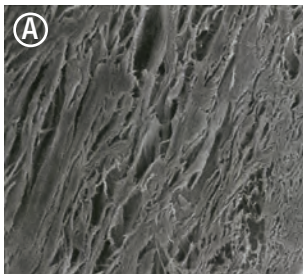
- This product can carry out the functional blocks of the membrane (soft tissue penetration protection) due to its long absorption period, and has excellent manipulability.
- This product is produced under the stringent standards of the MFDS.
- The world's first E-Beam sterilization can induce safe and prompt engraftment.
- E-Beam is safe and can be effectively sterilized without destroying the collagen tissue structure.
- This product is the first in the world with the basement membrane layer removed (patent pending) to maximize the transplant engraftment rate.
- This shows the high engraftment rate after the transplant by maximizing the influx of fibroblasts and/or the neovascularization. (Patent Application No. 10-2012-0026616)



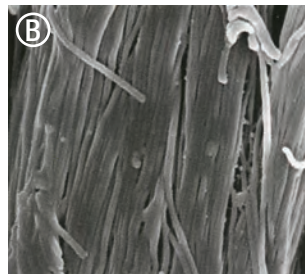
## Application

- Mucogingival defect.
- Soft tissue formation around the implant area.
- Wide perforation in the Schneiderian membrane.

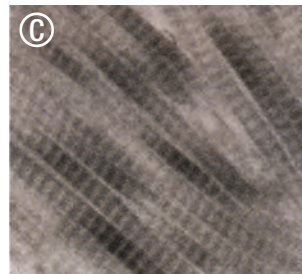
## SEM Images (They have kept the collagen structure after the E-Beam sterilization.)



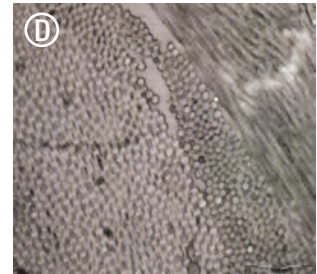
A. SEM (x200)



B. SEM (x20,000)



C. TEM (Transverse section)

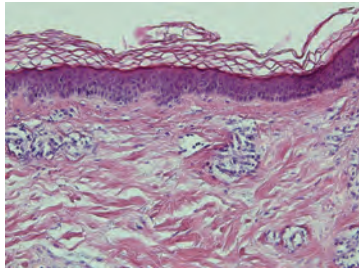


D. TEM (Cross section)

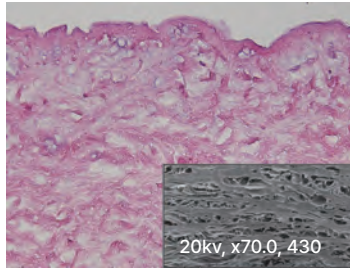
## Specifications

| Product Code | Size    | Thickness |
|--------------|---------|-----------|
| D1520P       | 15x20mm | 0.5~0.7mm |
| D1525P       | 15x25mm | 0.5~0.7mm |

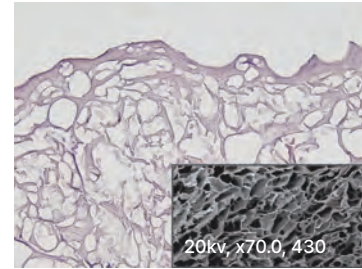
## MEGA DERM PLUS three-dimensional structure of the dermis



Normal skin

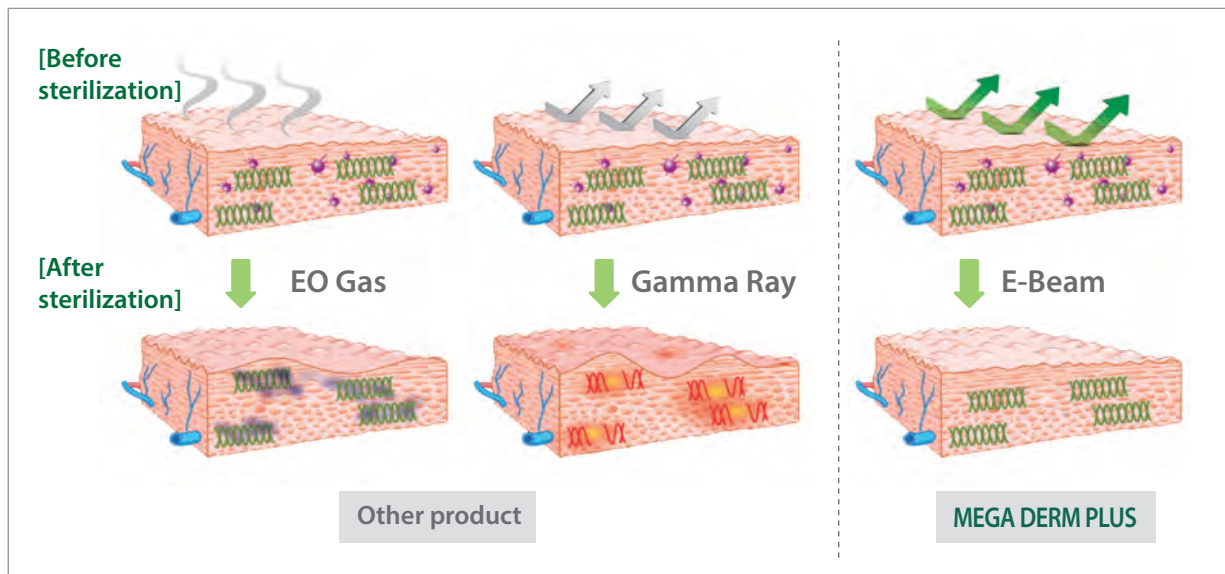


MEGA DERM PLUS



Other product

## The world's first 'E-Beam' sterilization that does not destroy the collagen structure



|  |                     |
|--|---------------------|
|  | Bacteria removal    |
|  | Normal collagen     |
|  | Destroyed collagen  |
|  | EO chemical residue |

# InnoGenic Non-resorbable Membranes

## InnoGenic Wifi-Mesh and InnoGenic PTFE-Mesh

The InnoGenic Wifi-Mesh, PTFE-Mesh and Ti-Mesh are non-resorbable barrier membranes to be applied over intraoral defects, especially, tooth extraction and bone augmented sites. The InnoGenic Wifi-Mesh and PTFE-Mesh are made of proprietary 100% PTFE, the polytetrafluoroethylene (teflon) sheet which is a biologically inactive and tissue compatible material and the InnoGenic Wifi-Mesh is reinforced with titanium frames (Titanium Gr II, ASTM F 67) embedded between two layers of PTFE sheets.

### InnoGenic Wifi-Mesh

> Packing unit: 1ea



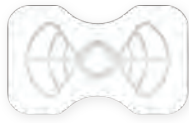
| Product Code | Size  | Thickness |
|--------------|-------|-----------|
| BTP1424AA    | 14X24 | 0.25      |
| BTP1424AB    | 14X24 | 0.25      |
| BTP1525BB    | 15X25 | 0.25      |
| BTP1725CA    | 17X25 | 0.25      |
| BTP1725CA12  | 17X25 | 0.25      |
| BTP2030AB    | 20X30 | 0.25      |
| BTP2030AB12  | 20X30 | 0.25      |
| BTP2530AB    | 25X30 | 0.25      |
| BTP2530AB15  | 25X30 | 0.25      |
| BTP3040AB    | 30X40 | 0.25      |
| BTP3040AB15  | 30X40 | 0.25      |



BTP1424AA



BTP1424AB



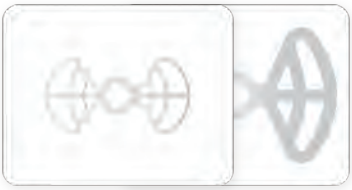
BTP1525BB



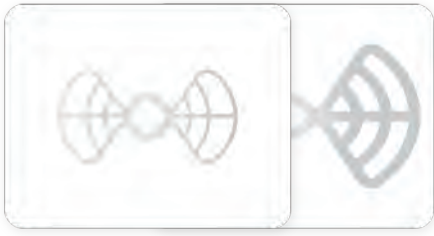
BTP1725CA / BTP1725CA12



BTP2030AB / BTP2030AB12



BTP2530AB / BTP2530AB15



BTP3040AB / BTP3040AB15

\* Titanium material is the same

## Clinical Case using the Wifi-Mesh



• Periodontitis with local osteomyelitis of #45 & 47



• Bone graft using INNO-OSS Allo



• Shielding soft tissue penetration using Wifi-Mesh

3 months later



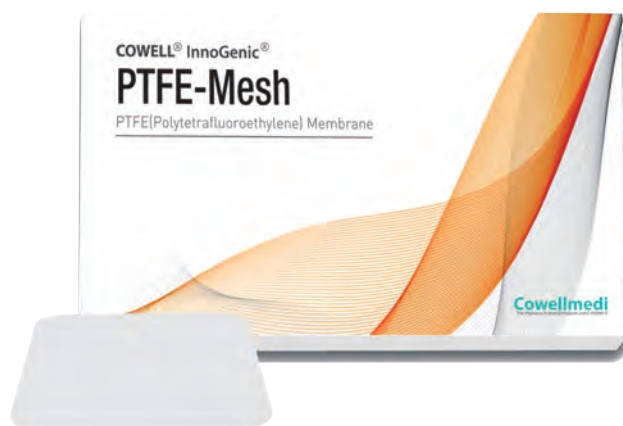
• Removal of Wifi-Mesh



• Dense periosteum layer has been formed

## InnoGenic PTFE-Mesh

> Packing unit: 5ea

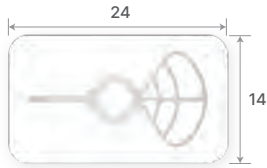
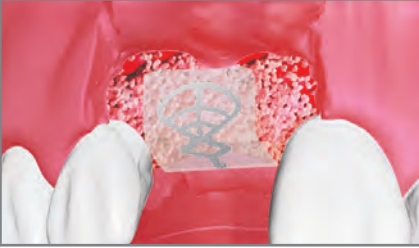
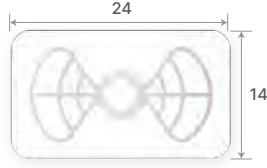

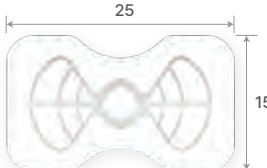
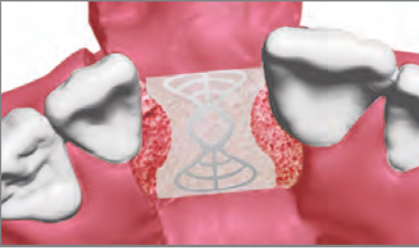
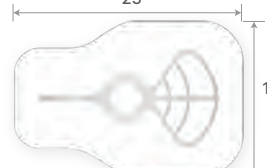
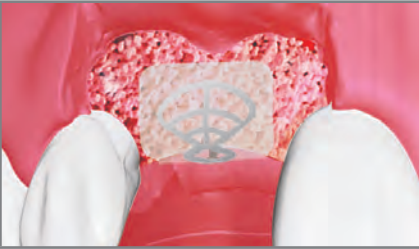








| Product Code | Size    | Thickness |
|--------------|---------|-----------|
| TS24301      | 24 x 30 | 0.1       |

## Features

- **Non-resorbable:** Made of 100% non-resorbable material for users to modulate healing period.
- **Non-porous (0.0 μm) + Open Membrane Sheet Technique:** Prevention of infection or other possible defects caused from passage or integration of bacteria through the porosity of plaster and it even allows to application of the Open Membrane Sheet Technique
- **Prevention of Displacement:** Not only being sutured along with gingiva but also being fixed with components from the **InnoGenic GBR Kit** to prevent displacement of the product.
- **Close to Transparency:** Observation of the healing of the underlying tissue through almost transparent PTFE surface allows more predictable result and helps determine removal time easier.
- **Easy to be Customized:** Easy to modify the shape according to shape and dimension of the defect.
- **Easy to be Removed :** Put a hook in the hole of the titanium frame of the InnoGenic Wifi-Mesh and in any center part of the InnoGenic PTFE-Mesh and remove.

# Indications

|   |   |
|---|---|
|  <p><b>BTP1424AA</b></p>                 | <p>Only one wall defect of buccal or lingual bone in very narrow area</p>             |
|  <p><b>BTP1424AB</b></p>                 | <p>Two wall defects of buccal and lingual bone in very narrow area</p>                |
|  <p><b>BTP1525BB</b></p>                 | <p>Inter-dental two wall defects of buccal and lingual bone in very narrow area</p>  |
|  <p><b>BTP1725CA / BTP1725CA12</b></p> | <p>Inter-dental two wall defects of buccal and lingual bone in narrow area</p>      |
|  <p><b>BTP2030AB / BTP2030AB12</b></p> | <p>Two wall defects of buccal and lingual bone in narrow area</p>                   |
|  <p><b>BTP2530AB / BTP2530AB15</b></p> | <p>Two wall defects of buccal and lingual bone in large area</p>                    |
|  <p><b>BTP3040AB / BTP3040AB15</b></p> | <p>Two wall defects of buccal and lingual bone in very large area</p>               |

# CLINICAL APPLICATION **Wifi-Mesh**

## Case 1



Pre-op



Implant placement



Implant placement



Clinical occlusal view of #45 and #46 showed severe bone defects.



Buccal bone graft technique with Wifi-mesh of #45



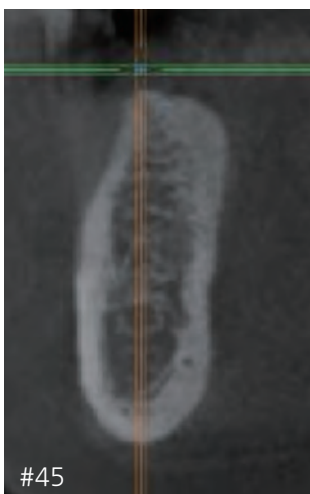
Wifi-Mesh trimming



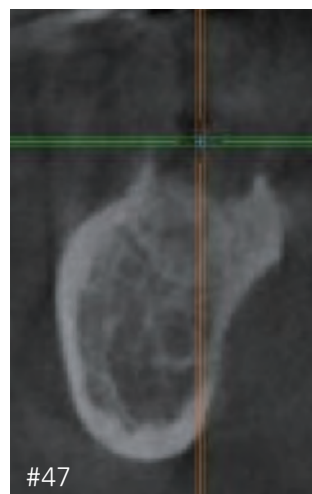
Wifi-Meshes were applied to the defect.



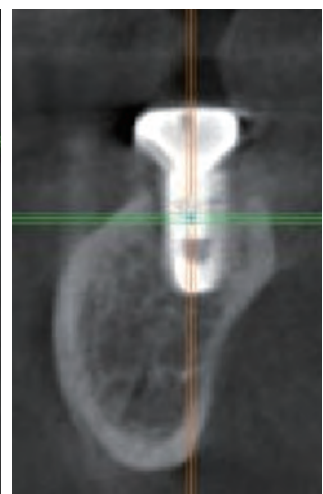
Open membrane technique in extraction socket of #46



#45

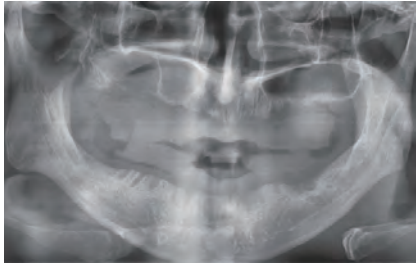


#47



# CLINICAL APPLICATION **Wifi-Mesh**

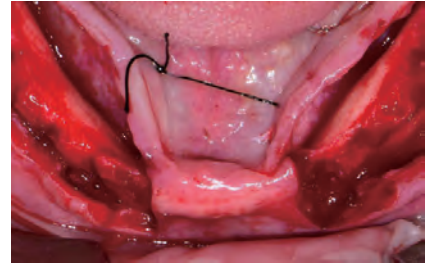
## Case 2 \_ Dr. Hoyeol Jang



Pre-OP panorama



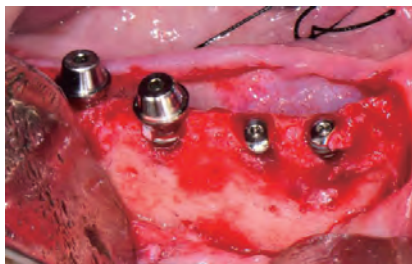
Occlusal view of the bone defect



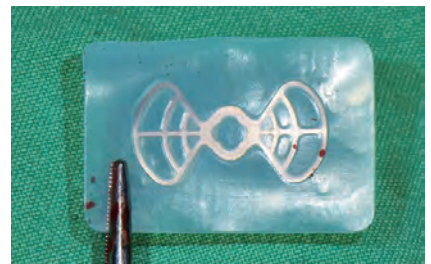
Flap reflection



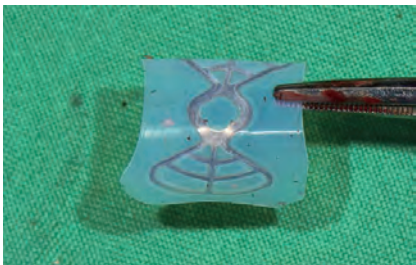
Drilling



Implant placement of #43, 44, 45 & 46



Wifi-Mesh



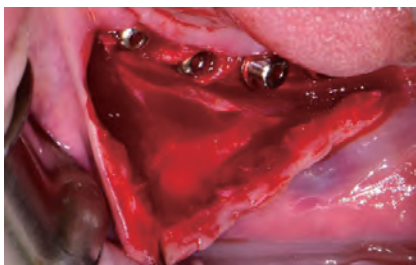
Wifi-mesh preparation  
\*It must be bent to form a shape, and If it is bent incompletely, it can spread inside the gingiva.



Wifi-mesh placement



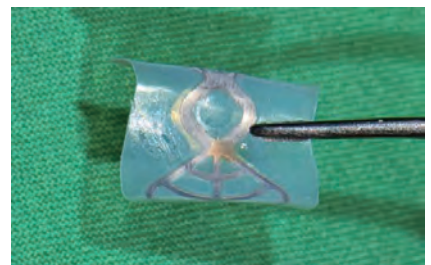
Implant placement of #33, 34, 35 & 36



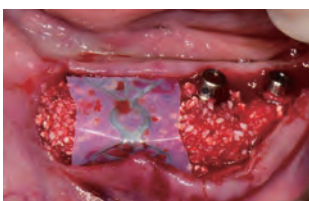
Releasing incision



Bone graft



Wifi-mesh preparation



Wifi-Mesh placement



Membrane holding suture

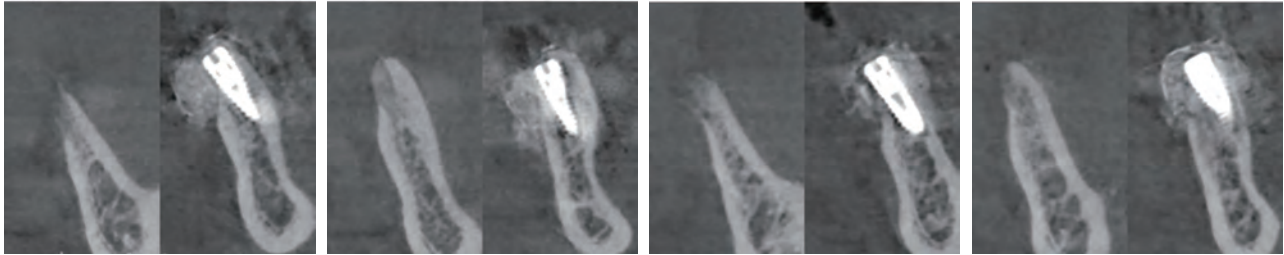


Primary suture



Post OP panorama

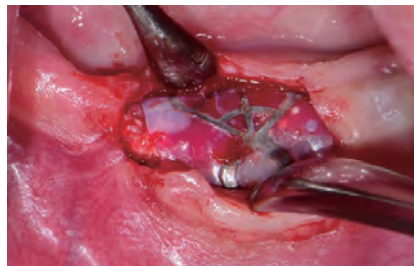
# CLINICAL APPLICATION **Wifi-Mesh**



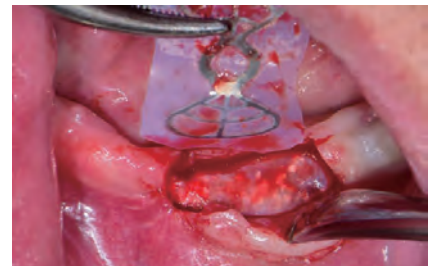
CT scan images after GBR shows significant amount of alveolar bone regeneration.



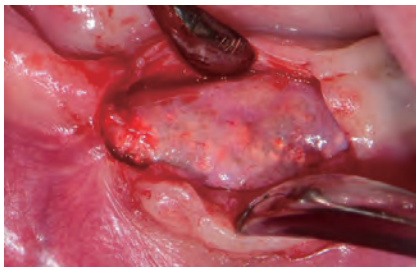
2 months after the 1st surgery



2nd surgery and Wifi-Mesh removal



The Wifi-mesh was easily removed.



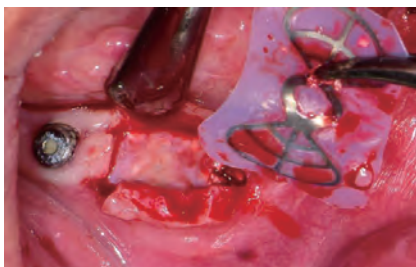
The defect area was fully filled with the new bone.



Installation of healing abutments



Incision of #43 and 44



Membrane removal



Both horizontal and vertical bone regeneration was noticed clinically.



Uncovering surgery of Lower jaw



2nd OP panorama



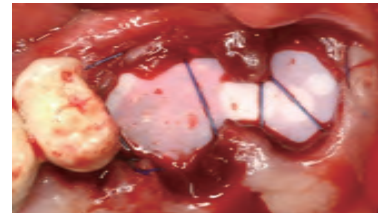
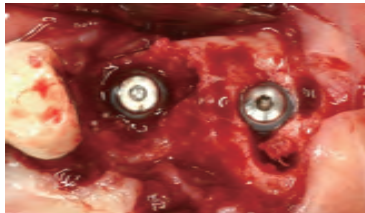
POD 3 months Temporary loading



# CLINICAL APPLICATION PTFE-Mesh

## Case 1

Open membrane technique and immediate implant placement in maxillary molars



The maxillary molars were extracted.  
The PTFE-Mesh was covered over the bone graft of  
socket preservation and implants.



**3 weeks.**

3 weeks after the graft operation, the PTFE-Mesh was removed. The new keratinized gingiva was regenerated on the bone graft particles.



**4 months.**

4 months after the graft operation, the keratinized gingiva was regenerated in the defect of socket.



**At visit.**



**Surgery.**



**6 months.**



**32 months.**

After 6 months of implant placement, the splinted crown was placed.

There was no loss of marginal bone at the 32 months follow-up visit.

As result, the immediate implant placement and the open membrane technique with socket bone graft could make the new keratinized gingiva.

# CLINICAL APPLICATION PTFE-Mesh

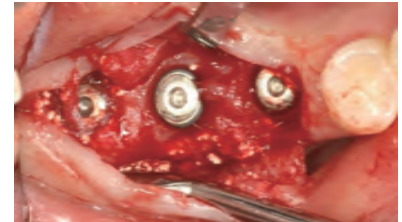
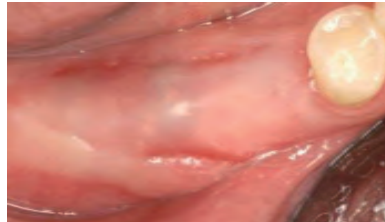
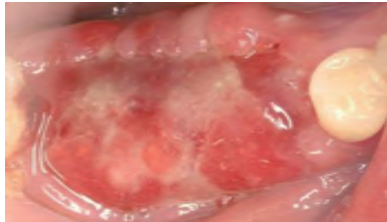
## Case 2

Lateral bone graft with immediate implant placement in mandibular molars



Lateral bone graft with implant placement was done in mandibular 1st molar.

The extraction sockets of 2nd molar and 2nd premolar were grafted with the open membrane technique.



3 weeks after the graft operation, the PTFE-Mesh was removed. The new keratinized gingiva was regenerated on the bone graft particles.

3 months after the graft operation, the keratinized gingiva was regenerated in the defect of socket.



At visit.

Lateral bone graft.



4 months.

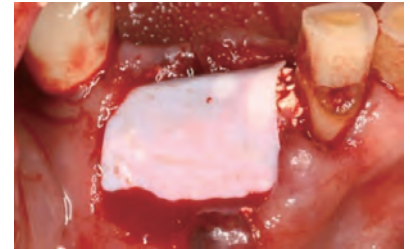
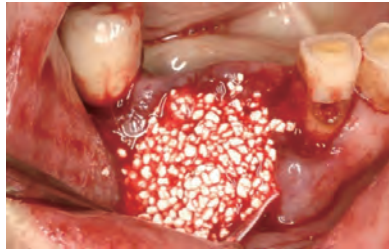
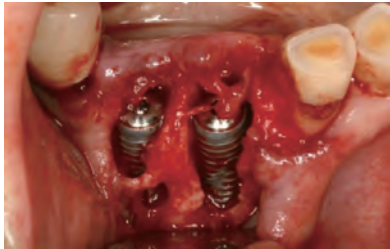
31 months.

During healing period, the crestal bone level was decreased in the site of lateral bone graft. From 4 months to 31 months of follow-up visit, there was no the loss of marginal bone. As result, lateral bone graft with implant placement and open membrane technique in extraction socket could make the new keratinized gingiva.

# CLINICAL APPLICATION PTFE-Mesh

## Case 3

Socket preservation with immediate implant placement in mandibular premolars



Socket bone graft with implant placement was done in the buccal wall defect of mandibular premolars. The extraction sockets of premolars were grafted with the open membrane technique.



3 weeks after the graft operation, the PTFE-Mesh was removed. The new keratinized gingiva was regenerated on the bone graft particles.



3 months after the graft operation, the keratinized gingiva was regenerated in the defect of socket, and the splinted crown was placed.



At visit.



Surgery.



3 months.



15 months.



28 months.

28 months of follow-up visit, there was no the loss of marginal bone.

As result, the open membrane technique with implant placement in he buccal wall defect of premolars could make the new keratinized gingiva.