

Exceptional Technology Proven with Distinct Results

THE Graft 4th Clinical Cases Report

The technology of THE Graft has been acknowledged by one of the SCI journals,
Clinical Implant Dentistry and Related Research, through a randomized clinical trials with other xenograft.

Clinical
Implant
Dentistry
and
Related
Research

Volume 00, Number 00, 2016

“ See **The Graft**, Feel The Great ”



THE Graft 
Natural Bone Substitute
Cancellous Granules

Randomized clinical trial of maxillary sinus grafting using deproteinized porcine and bovine bone mineral

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Research Outline

01 Research Purpose

Radiological and histological comparison through maxillary sinus augmentation.
– Qualitative analysis of bone and volume stability

02 Research Institutes and Subjects

2 Institutes (Yonsei University, Inha University), 12 participants, 16 sites
(7 for control group: Bio-Oss / **9 for test group: THE Graft**)

03 Research Method

Research was conducted with a highly scientific RCT(Randomized Clinical Trial) method in order to disclude biased selection or procedure

04 Main Information for Maxillary Sinus Bone Graft

– Height of the remaining bone at the time of maxillary sinus bone augmentation (Test group): 1.90 ± 0.80
– Trephine bur biopsy, radiograph was taken 6 months after the surgery

Research Result

01 Clinical Observation

– Clinical evaluation of bone quality 6 months after the surgery
: Proper torque of 30~50Nm is expected for Type 2 or 3
– No complications were found except schneiderian membrane perforation from one case

02 Radiological Observation (CT)

Radiopacity was intensified while increased volume is maintained with stability

03 Histological Observation

Despite both groups showed similar patterns in bone formation within the grafted area based on the histological result, relatively larger particles of residual materials were found in the control sites compared with the test sites. The particles might be degraded mechanically or biologically/chemically. Also, denser fibrotic connective tissue occurred at the fibrovascular tissue area between the complexes of mineralized tissue/residual materials in the control sites, whereas loose connective tissue and multinucleated osteoclast-like cells could be found more frequently in the test sites than the control sites

04 Histomorphometric Observation

Measurements of Radiographic and Histometric Analyzes (mean \pm SD)						
	Control Test (ITT)		Test (PP)		Test (ITT)	
	Surgery	6 Months	Surgery	6 Months	Surgery	6 Months
Radiographic analyzes						
Augmented height, 3D (mm)	15.06 \pm 2.61	15.02 \pm 3.17	12.97 \pm 1.31	13.26 \pm 1.89	13.05 \pm 1.25	13.40 \pm 1.82
Augmented volume (cc)	1.74 \pm 0.47	1.90 \pm 0.52	1.56 \pm 0.45	1.70 \pm 0.61	1.76 \pm 0.72	1.87 \pm 0.77
Histometric analyzes						
Newly formed bone (%)	26.15 \pm 7.11		29.77 \pm 9.38		27.95 \pm 10.33	
Residual biomaterials (%)	25.74 \pm 18.75		15.24 \pm 9.11		15.40 \pm 8.53	
Fibrovascular tissue (%)	48.11 \pm 12.69		54.99 \pm 12.00		56.64 \pm 12.28	

Key Point

THE Graft is an optimal biomaterial for GBR on maxillary sinus that carries out new bone formation and volume maintenance with no complications after operation. With its outstanding handling property from the high hydrophilicity, the lateral side approach as well as the alveolar side is appropriate and re-entry also can be performed after 6 months for maxillary sinus GBR. The clinical cases were carried out when there is 1~6mm of remaining bone, but the actual average of remaining bone mass was 2mm. Also, as type 2~3 and bone quality of 30~50Nm was observed, it was evidenced that a treatment can be performed with high prognosis. THE Graft is proving its quality based on the results from various research as well as clinical trials for GBR on the extraction site due to periodontitis, horizontal and vertical alveolar bone augmentation and other procedures.

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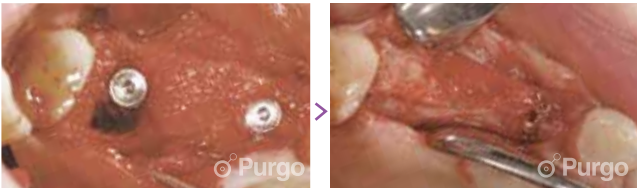


Summary

CASE 40

Dr. H. S. Kim

| Pre-op | | After surgery |



Case for Recovery of Peri-Implant Bone Defect for #16

CASE 41

Dr. K. M. Min

| Pre-op | | After surgery |



Case for Peri-Implant Bone Defect of #16 Mandibular Molar

CASE 42

Dr. K. M. Min

| Pre-op | | After surgery |



Case for Peri-Implant Bone Defect of #46 ~ 47 Mandibular Molar

CASE 43

Dr. J. C. Park

| Pre-op | | After surgery |




Case of Implant Placement after Vertical Augmentation for #46 Mandibular Molar

CASE 44

Dr. J. C. Park

| Pre-op | | After surgery |



Case of Implant Placement after Ridge Preservation for Maxillary Molar #27

CASE 45

Dr. D. H. Yang

| Pre-op | | After surgery |



Case of Healing Process after the Failure of Implant Placement for #35

CASE
46



Dr. Ki Lee

| Pre-op |



Purgo

| After surgery |



Purgo

Case for Peri-Implant Bone Defect of #25 ~ 27 and Ridge Augmentation

CASE
47



Dr. Ki Lee

| Pre-op |



Purgo

| After surgery |



Purgo

Case of Implant Placement after Ridge Preservation for #46 ~ 47

CASE
48



Dr. D. W. Lee



Purgo



Purgo

Case of Implant Placement after Ridge Preservation for #46 ~ 47

CASE
49



Dr. K. Y. Chang



Purgo



Purgo

Case for Healing Process 4 Months after Ridge Augmentation of #14 ~ 15

CASE
50



Dr. J. W. Choi



Purgo



Purgo

Case of the Implant Placement and Bone Graft after Ridge Split for Mandibular Molar

CASE
51



Dr. J. W. Choi



Purgo



Purgo

Case for Bone Defect of Mandibular Molar #36 ~ 37

CASE
52



Dr. S. M. Han



Purgo



Purgo

Case for Healing Process of Bone Defect 4 Months after Transmucosal GBR at #37



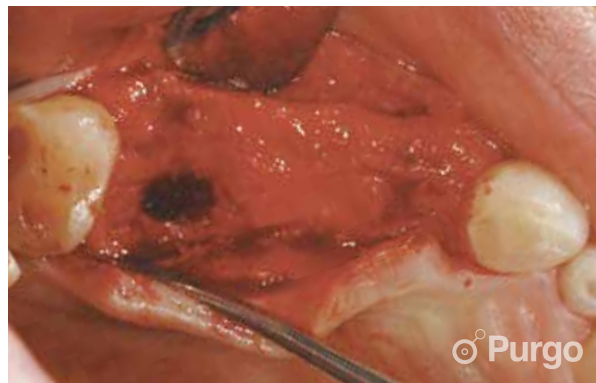
CASE 40

Case for Recovery of Peri-Implant Bone Defect for #16

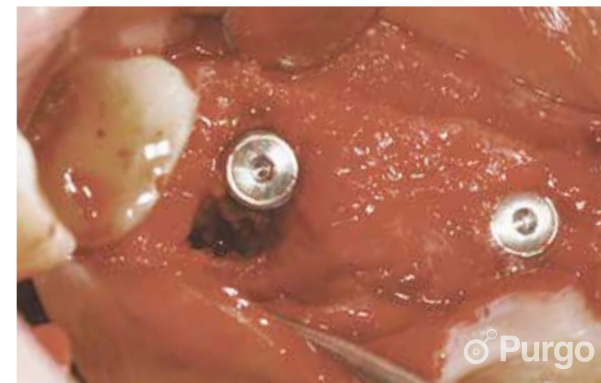
Dr. H. S. Kim (Grutugi Dental Clinic)



1 Pre-op clinical photograph (15.8.20)



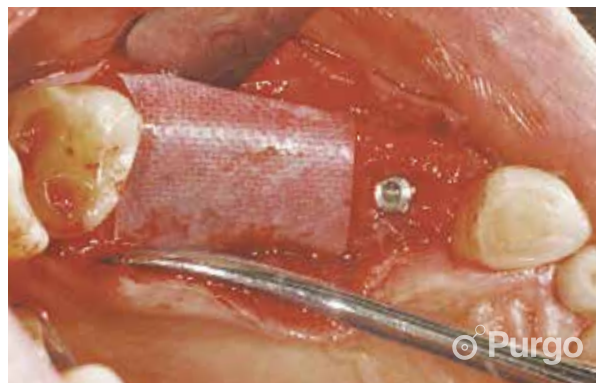
2 Flap opening



3 Implant placement



4 Grafting the bone substitute, THE Graft on palatal side of #16



5 Applying the resorbable membrane, BioCover



6 PTFE suture, Biotex

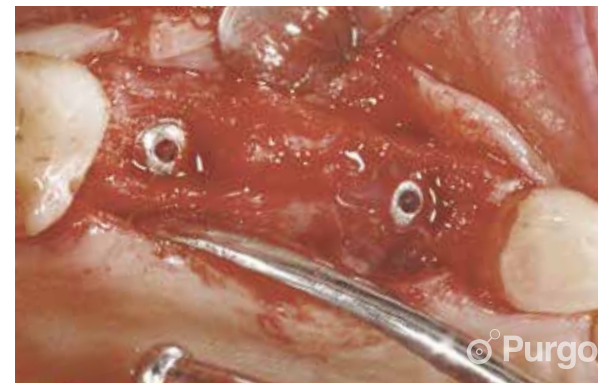
It is a case of a 72-year-old female with large bone defect at #16 palatal side. GBR was performed 3.5 months after the extraction. As the patient was an old-aged female, a slow process of bone tissue recovery was expected. When the second surgery was performed 4.5 months after GBR, BioCover was still functioning as a barrier, and osteoid tissue which covered the implant was observed.



7 Healing process before second surgery (16.1.4)



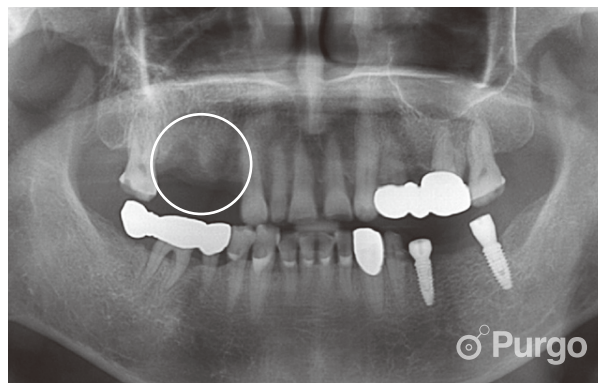
8 Re-entry(16.1.4)



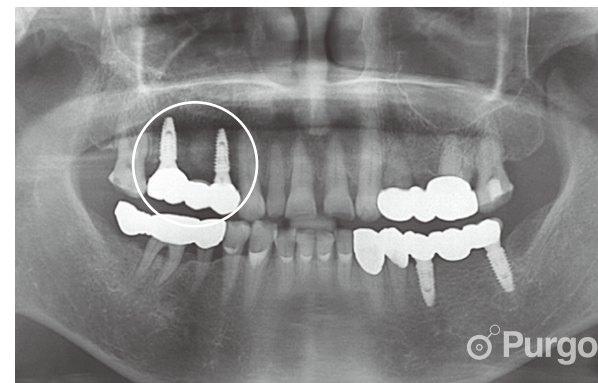
9 Cover screw is visible



10 Loading prosthesis (16.2.26)



11 Pre-op panorama (16.8.20)



12 Panorama after surgery (16.4.27)

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CASE 41

Case for Peri-Implant Bone Defect of #16 Mandibular Molar

Dr. K. M. Min (Seoul Mai Dental Clinic)



1 Pre-op clinical photograph (14.11.14)



2 Extraction of #47 due to the bone fracture (14.11.14)



3 Healing process 4 months after the extraction (15.3.12)



4 Flap opening(15.3.12)



5 Implant placement



6 Grafting the bone substitute, THE Graft, after applying the resorbable membrane, BioCover

It is a case of a patient who suffered from a severe toothache due to odontoclasia. An extraction was proceeded on the first day the patient visited the clinic, and severe defect in alveolar bone was examined right after extraction. As hardening around lesion was observed from the radiograph, the implant was planned to be placed after 7 months of a sufficient healing process, but the defect was still detected even then, and alveolar bone grafting was performed using THE Graft and BioCover on the upper part of the fixture in order to secure enough bone width. At the second surgery after 4 months, a sufficient amount of newly formed tissue was visible. The case is still under observation after 1 year of loading prosthesis and a successful, stable peri-implant mucosa and marginal bone are still observed clinically as well as radiologically.



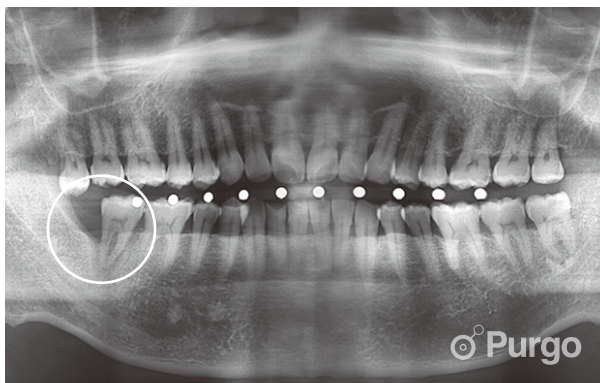
7 PTFE suture, Biotex



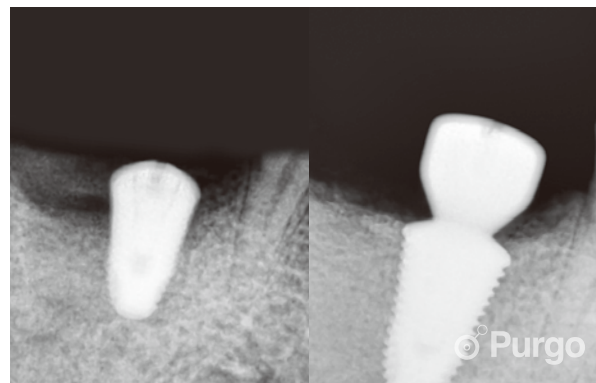
8 Re-entry for the second surgery (15.7.23)



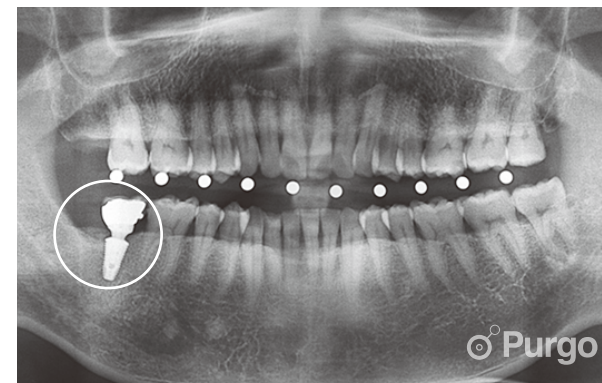
9 Buccal view after loading prosthesis (16.4.7)



10 Pre-op panorama (14.11.14)



11 Radiograph after implant placement (15.3.26) and after the second surgery (15.7.23)



12 Post-op panorama (15.8.27)

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CASE 42

Case for Peri-Implant Bone Defect of #46 ~ 47 Mandibular Molar

Dr. K. M. Min (Seoul Mai Dental Clinic)



1 Pre-op clinical photograph (15.11.29)



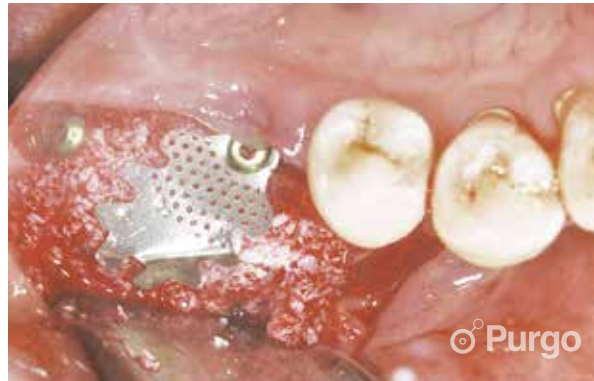
2 4 months after the extraction of #46 (15.7.16)



3 Drilling for implant placement after flap opening (15.7.16)



4 Implant placement



5 Grafting the bone substitute, THE Graft, and applying titanium mesh



6 Applying the resorbable membrane, BioCover

It was a case of class III malocclusion patient with periodontitis in the molar area. Although the patient has been taking periodontal care for 10 years, molars were extracted due to the root lesion and occlusal trauma within the recent 2~3 years. The patients who kept their teeth along with periodontal treatment and occlusal adjustment for a long period of time tend to have severe bone defects when extractions happen. When flap was reflected after 4 months, a large bone defect was observed on the extraction site, so implant was fixed carefully and GBR was performed with THE Graft and BioCover. At the 2nd surgery after 6 months, a sufficient amount of new bone formation was visible and the bone quality was relatively firm.



7 PTFE suture, Biotex



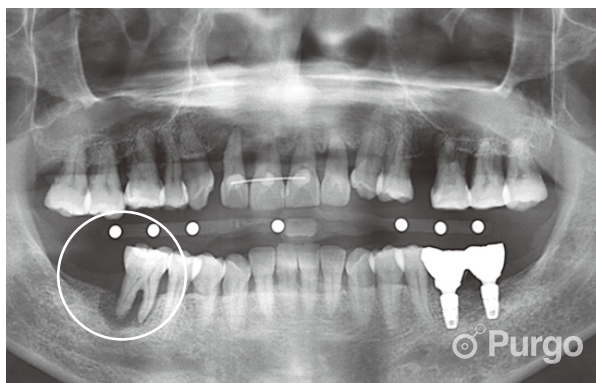
8 Re-entry process 6 months after the surgery (16.1.5)



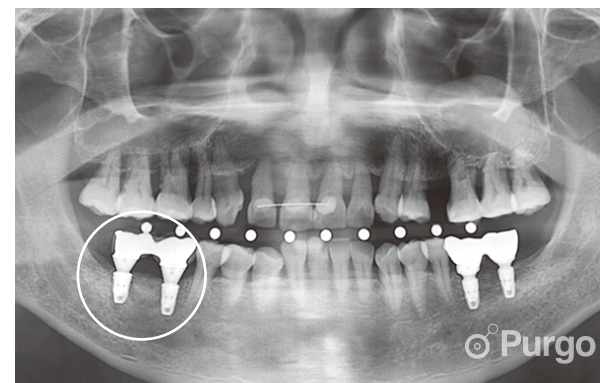
9 Removing cover screw



10 Buccal view after loading prosthesis (16.2.27)



11 Pre-op panorama (14.12.3)



12 Panorama after surgery (16.2.27)

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Cancellous Granules





CASE 43

Case of Implant Placement after Vertical Augmentation for #46 Mandibular Molar

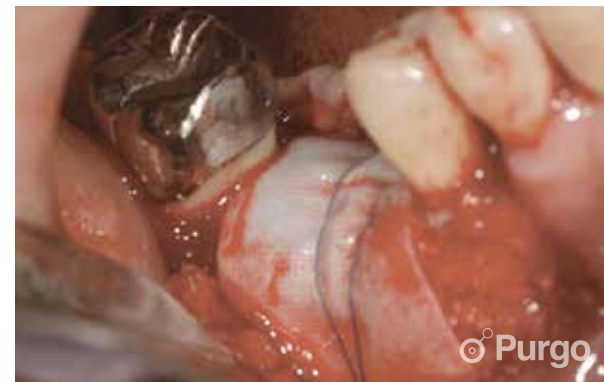
Dr. J. C. Park (Hyo Dental Clinic)



1 Pre-op clinical photograph after extraction (14.5.27)



2 Flap opening(14.5.27)



3 Grafting the bone substitute, THE Graft, applying titanium mesh and resorbable membrane, BioCover



4 Suture



5 Before removing titanium mesh

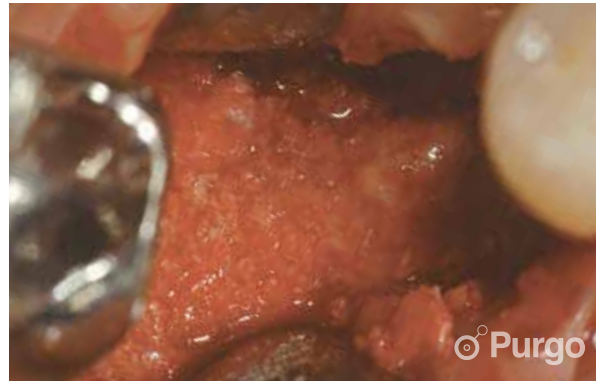


6 After removing titanium mesh

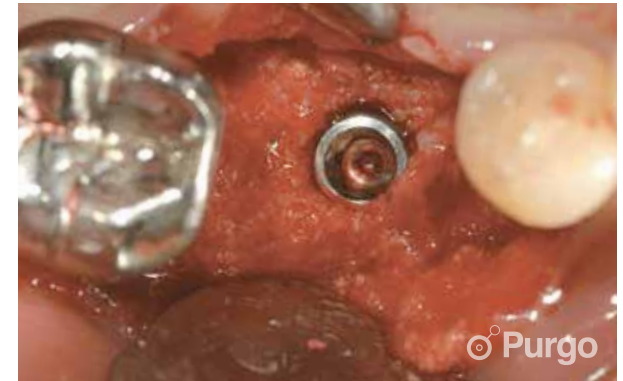
It is a case of a patient with a fractured root of #46. As there was a severe vertical bone defect, GBR was performed with a titanium mesh and the xenograft, THE Graft. 2.5 months after the bone graft, titanium mesh was exposed and removed. Implant was placed after 4 months. It has been 1 year and 5 months since the implant was placed, and vertical bone is newly formed at #46 and well kept with with increased volume of 3mm on mesial side and 5mm on distal side. This case verifies that a certain amount of vertical augmentation is possible with a xenograft alone.



7 Healing process before implant placement (14,10,7)



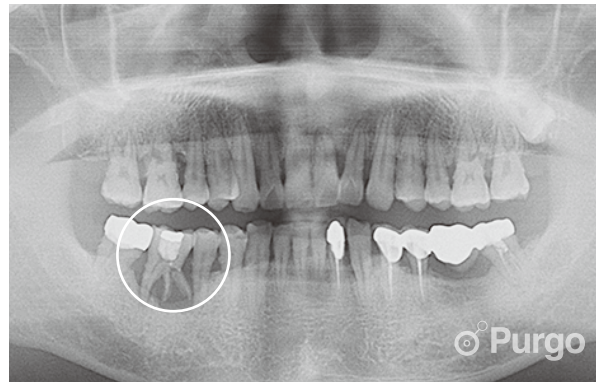
8 Re-entry for implant placement (14,10,7)



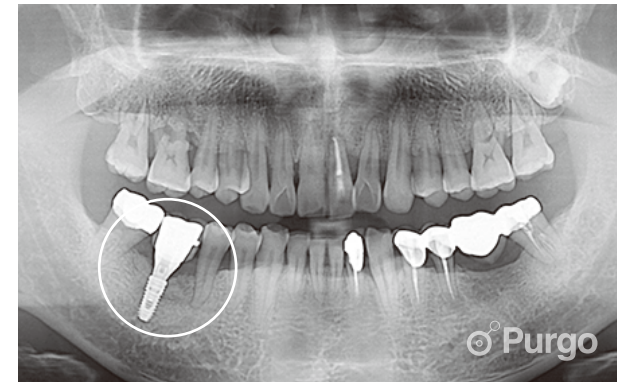
9 Implant placement



10 Loading prosthesis (15,2,25)



11 Pre-op panorama (13,9,24)



12 Panorama taken 15 months after loading prosthesis (16,6,3)

Natural Bone Substitute
Cancellous Granules





CASE 44

Case of Implant Placement after Ridge Preservation for Maxillary Molar #27

Dr. J. C. Park (Hyo Dental Clinic)



1 10 days after the extraction of #27



2 Flap opening for implant placement 5 months after the extraction (14,10,10)



3 Grafting the bone substitute, THE Graft



4 Suture after applying the resorbable membrane, BioCover



5 Healing process before implant placement (16,6,4)

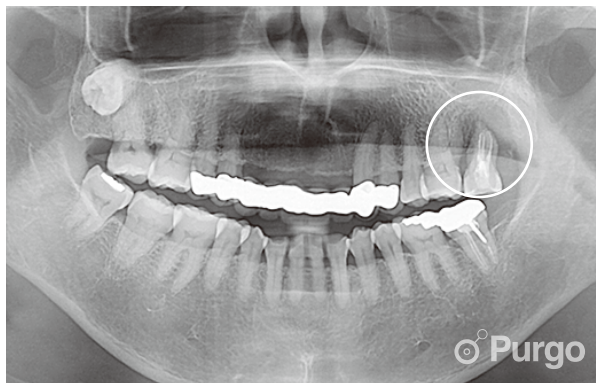


6 Samples were taken for biopsy

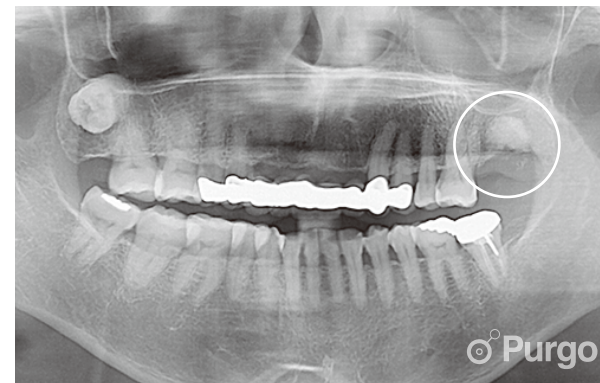
It is a case where GBR was performed with THE Graft and a resorbable membrane. 5 months after the extraction of #27, implant placement was attempted, but failed due to a large bone defect and the implant was placed after 20 months due to patients' personal reasons. The result of the biopsy shows increasing amount of newly formed bones as the bone substitute is being resorbed. This case shows that bone defect can be recovered through grafting the xenograft, THE Graft alone.



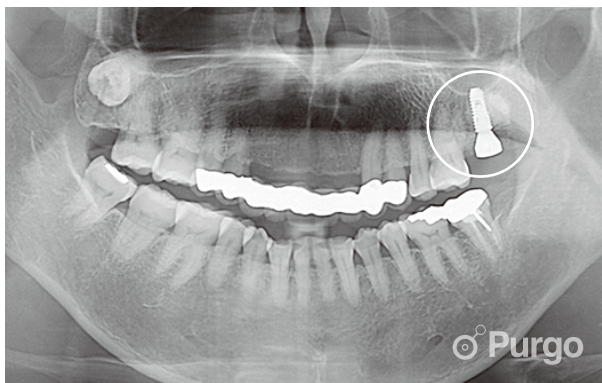
7 Placing healing abutment after checking whether there is enough bone torque for the implant placement



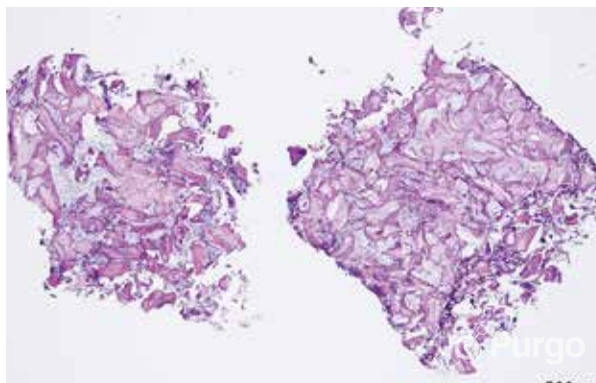
8 Pre-op panorama (14,5,19)



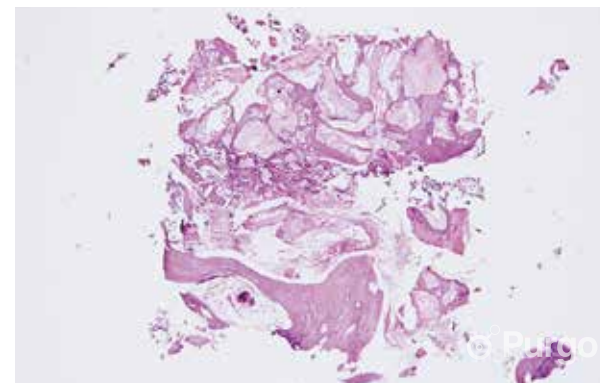
9 5 months after grafting the bone substitute (15,3,27)



10 Panorama after the implant placement (16,6,4)



11 The graft bones were almost surrounded by new bones, and subsequently anastomosed. Excellent bony remodeling.



Natural Bone Substitute
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CASE 45

Case of the healing process after the failure of implant placement for #35

Dr. D. H. Yang (Boston Seoul Dental Clinic)



1 After removing the failed implant and inflammatory peri-implant tissues of #35, a huge amount of bone loss was occurred, but it was observed that the surrounding cortical bone was maintained (15.9.2)



2 Grafting the bone substitute, THE Graft



3 Applying the resorbable membrane, BioCover



4 PTFE suture, Biotex



5 2 weeks after suturing (15.9.16)



6 Re-entry for the implant placement (16.3.9)

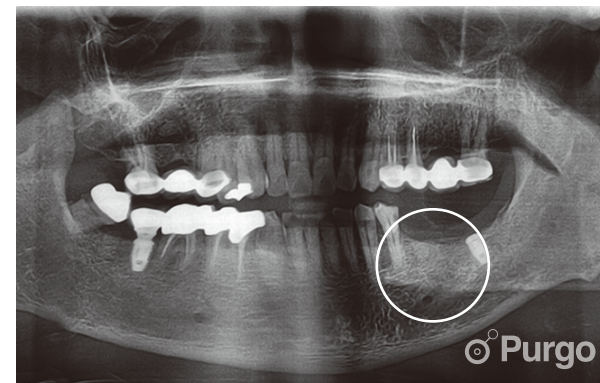
It is a re-implantation case after removal of inflammatory responses around the previously placed implant at left mandibular premolar. Previous implant was placed at #35~37 on May, 2015, and after 3 months, fixture as well as inflammatory tissues were removed due to inflammatory response and patient's discomfort. Although there was large amount of bone loss, fortunately, cortical wall was still remained. Bone defect was regenerated with THE Graft and BioCover, and the case was completed with the loading of prosthesis. The result was successful clinically as shown in the biopsy, and it is well maintained until today.



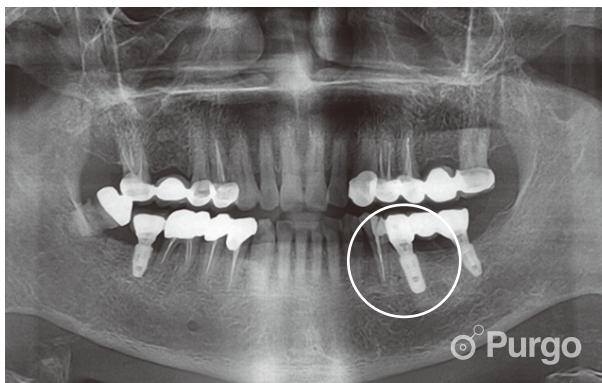
7 Re-placement of Implant for #35



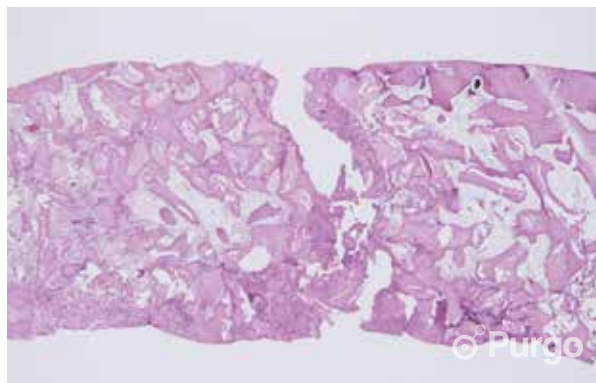
8 Panorama after the implant placement for #30 and #40 (15.5.26)



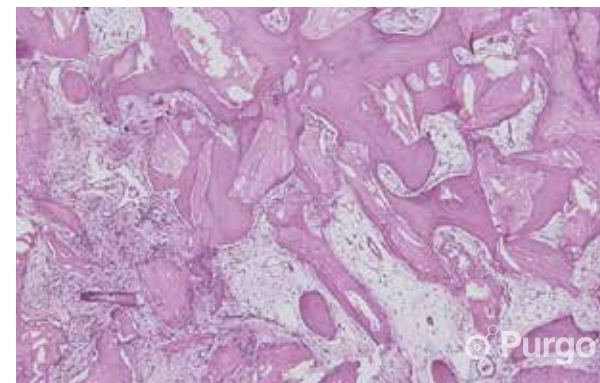
9 Panorama after removing the failed implant for #35 (15.9.2)



10 Panorama after loading prosthesis (16.7.20)



11 Excellent bony remodeling with good prognosis



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Cancellous Granules





CASE 46

Case for Peri-Implant Bone Defect of #25 ~ 27 and Ridge Augmentation

Dr. Ki Lee (Barun Dental Clinic)



1 Flap opening after extraction of #25 ~ 26



2 Implant placement



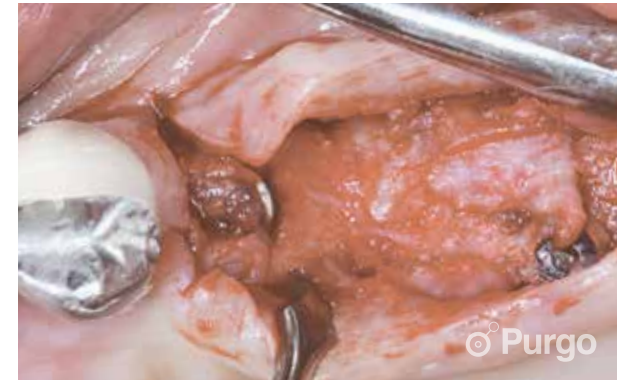
3 Grafting the bone substitute, THE Graft



4 Suture after applying the resorbable membrane, BioCover



5 Healing process prior to re-entry (15.10.6)



6 Re-entry

THE Graft

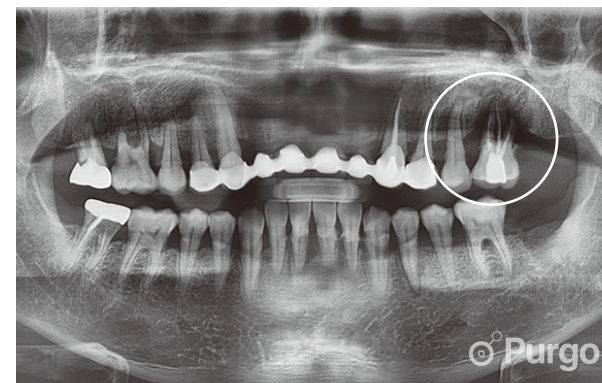
Vertical bone defect was visible on the mesial side of #25, while vertical and horizontal bone defect and mobility was visible at #26. After extraction, immediate implant placement and bone grafting was proceeded on the mesial and buccal bone defect of #25, and also for #27, bone grafting was performed for mesial bone defect. It has been a year since GBR was performed, and a favorable process of bone regeneration is visible radiologically.



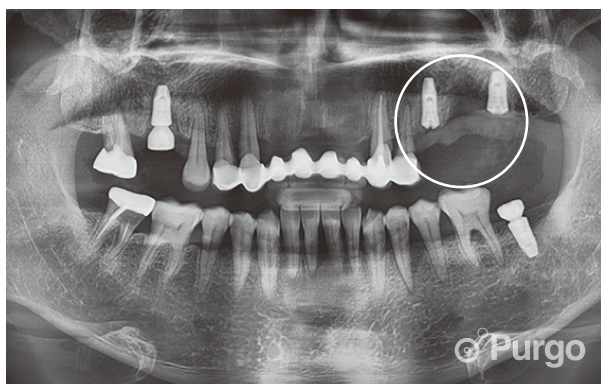
7 Samples were taken for biopsy after the placement of healing abutment



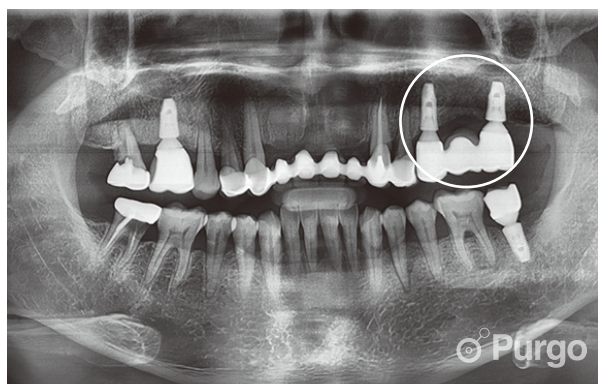
8 Soft tissue healing (15,11,3)



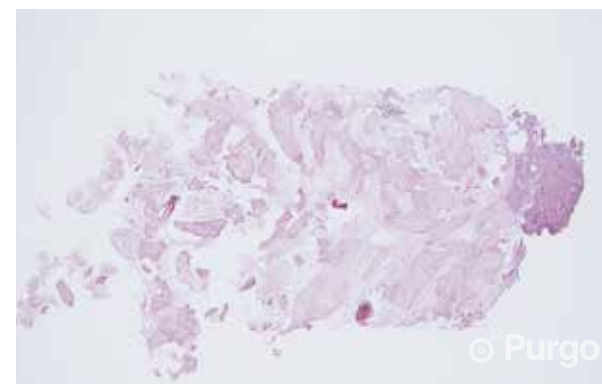
9 Panorama taken at the first visit (15,3,24)



10 Panorama after the implant placement (16,4,21)



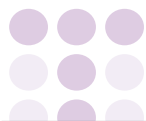
11 Panorama after loading prosthesis (16,6,14)



12 Partial bony remodeling

Natural Bone Substitute
Cancellous Granules





CASE 47

Case of Implant Placement after Ridge Preservation for #46 ~ 47

Dr. Ki Lee (Barun Dental Clinic)



1 Pre-op clinical photograph (15.7.2)



2 Extraction of #46 ~ 47, bone defect was observed after flap opening (15.7.2)



3 Grafting the bone substitute, THE Graft



4 Applying the resorbable membrane, BioCover and suturing



5 Healing process before removing the suture (15.7.8)



6 Healing process before re-entry (15.12.1)

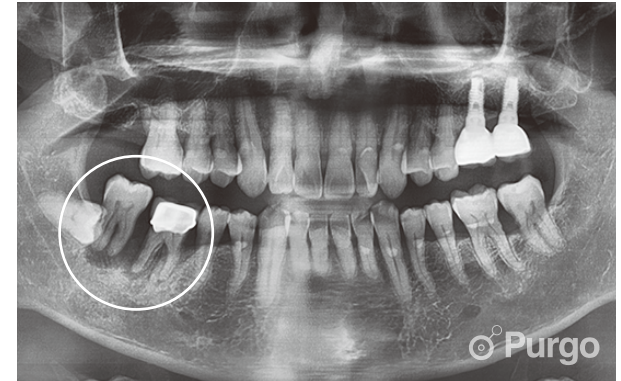
THE Graft was grafted after the extraction due to horizontal and vertical bone defect at #46 and 47.
Although the membrane was exposed, there was neither inflammatory reaction nor bone loss.
Implant was placed after 5 months, and currently a temporary tooth is placed. This is a successful case based on the histological observation.



7 Re-entry(15.12.1)



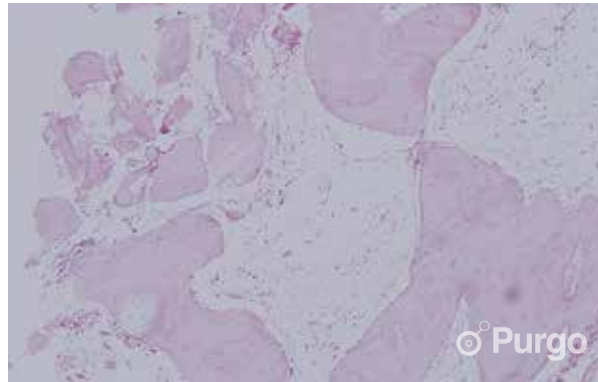
8 Implant and healing abutment were placed through one-stage implant surgery and samples were taken for biopsy



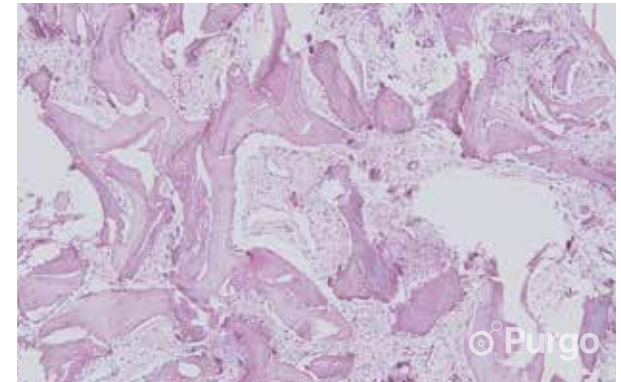
9 Pre-op panorama (15.6.27)



10 Panorama after the placement of temporary tooth (16.8.2)



11 #46, Favorable bony remodeling in good prognosis



12 #47, Excellent bony remodeling

Natural Bone Substitute
Cancellous Granules





CASE 48

Case of Implant Placement after Ridge Preservation for #46 ~ 47

Dr. D. W. Lee (VHS Medical Center)



1 Pre-op clinical photograph (15,10,16)



2 Checking the bone defect by removing the valves after the extraction of #37



3 Grafting the bone substitute, THE Graft, and applying the resorbable membrane, Ossix Plus



4 Covering the upper part with granulation tissue



5 Healing process before the implant placement (16,5,26)



6 Re-entry, samples were taken for biopsy

The patient visited our clinic due to the discomfort and mobility of the left molar teeth #2 for extraction and implant placement. Since a severe bone resorption on the buccal and lingual side was observed, extraction and at the same time, bone grafting procedures were recommended in order to improve the remaining bone height. Prior to procedures, inflammation was minimized with administration, and the flap was reflected with keeping the lower granulation tissue in its original place at the same time. After the lower bone defect was examined, the xenograft, THE Graft was grafted and on the upper part, the cross-linked collagen membrane, OSSIX PLUS was applied and sutured with the granulation tissue. At this point, releasing incision was not conducted purposely. After suturing, a partial exposure was observed but after 7 months, a satisfactory outcome was visible clinically as well as histologically.



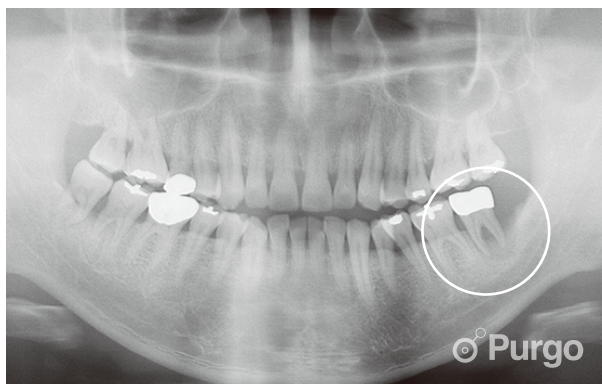
7 Confirming the enough bone torque for implant placement



8 Implant and healing abutment were placed



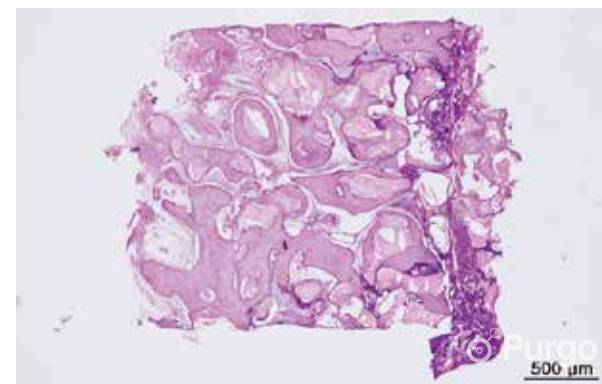
9 Healing process after one-stage implant surgery (15.7.14)



10 Pre-op panorama (15.7.14)



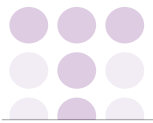
11 Radiograph after implant placement (16.6.9)



12 Excellent bony remodeling, indicating a good prognosis for dental implant

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Cancellous Granules





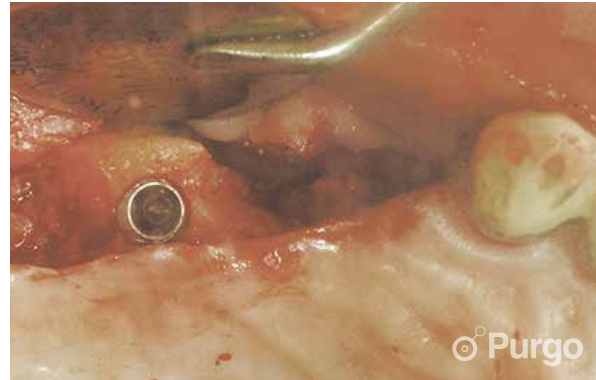
CASE 49

Case for the healing process 4 months after ridge augmentation of #14~15

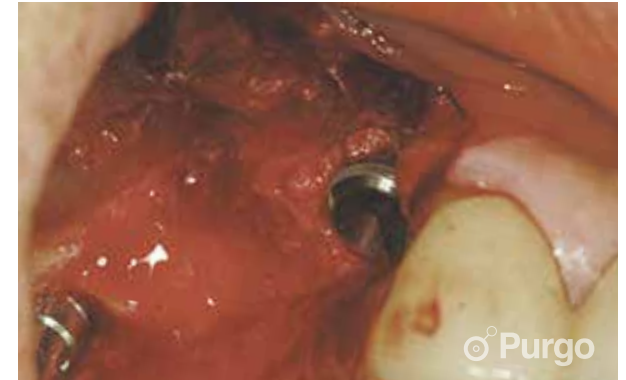
Dr. K. Y. Chang (Seoul Highan Dental Clinic)



1 Pre-op clinical photograph (15.10.26)



2 Flap opening and a large amount of bone loss on the buccal side was observed although implant was placed on the remaining bone (10.5.26)



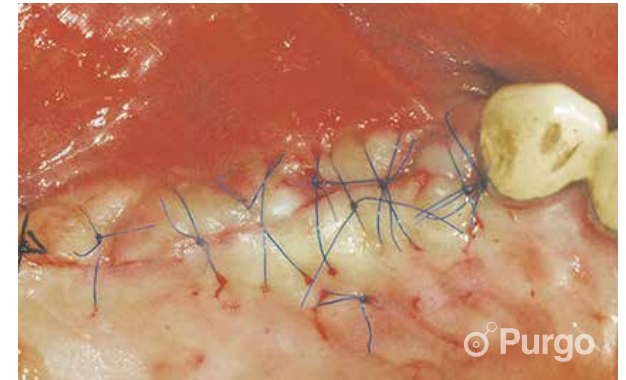
3 Buccal view



4 Grafting the bone substitute, THE Graft

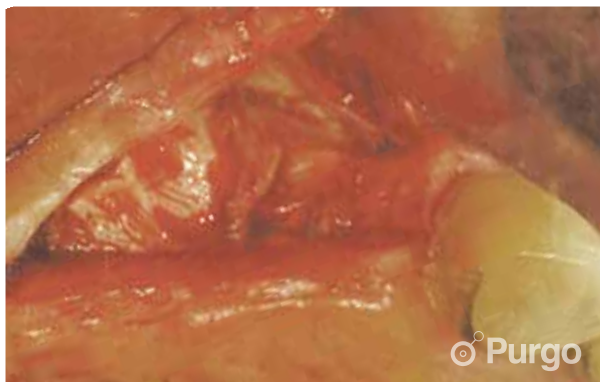


5 Applying the resorbable membrane, BioCover6



6 Suture

For a recovery of vertical bone defect, if non cross-linked resorbable membrane is applied, additional materials such as titanium mesh may be needed in order to maintain the bone frame due to the failure in keeping the bone volume. But since BioCover6 was excellent enough to maintain space with good handling property, it is recommended that it can be used alone for horizontal bone augmentation.



7 Re-entry, the resorbable membrane, BioCover6, is still functioning as barrier (16.3,21)



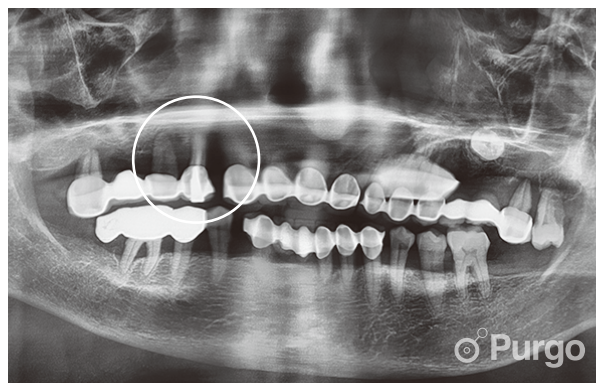
8 Remnants of BioCover 6



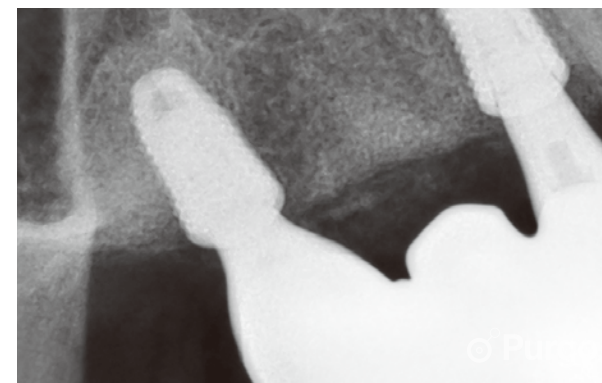
9 Healing process of the bone defect after removal of BioCover6



10 Prosthesis (16.6,16)



11 Pre-op panorama (15.9,15)



12 Radiograph of prosthesis (16.5,27)

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CASE 50

Case of the Implant Placement and Bone Graft after Ridge Split for the Mandibular Molar #36

Dr. J. W. Choi (Choi Jin Wook Dental Clinic)



It is a case of a patient who needed an implant for the lost, left mandibular molar #1.
 As it has been a while since the mandibular molar was lost, a severe horizontal bone resorption was observed.
 Ridge splitting was performed for stability, and the defect was transformed into contained defect, and GBR was performed with the xenograft,
 THE Graft, and the resorbable membrane, EZ-cure. After 6 months, the second surgery was conducted and the prosthesis was made. The result was clinically satisfactory.



7 Re-entry for the second surgery (15.6.23)



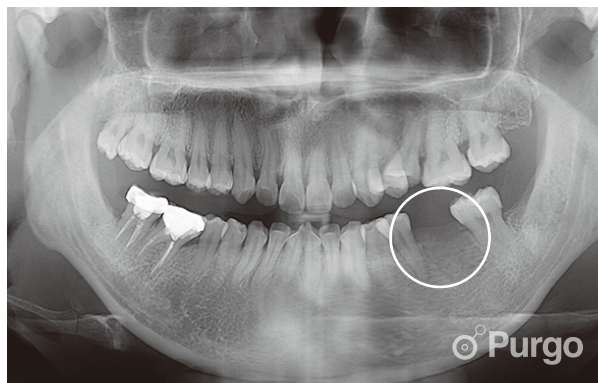
8 Cover screw is visible



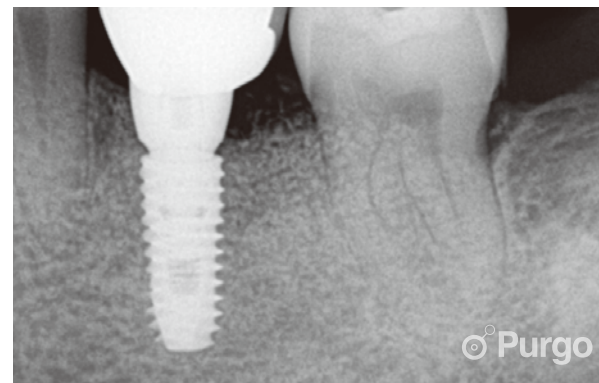
9 Checking after the prosthesis (16.1.27)



10 Buccal view after loading prosthesis



11 Pre-op panorama (14.12.17)



12 Radiograph after loading prosthesis (16.4.23)

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CASE 51

Case for the Bone Defect of Mandibular Molar #36~37

Dr. J. W. Choi (Choi Jin Wook Dental Clinic)



1 Pre-op clinical photograph (15.6.8)



2 Flap opening, narrow alveolar ridge is observed (15.6.26)



3 Implant placement



4 Decortication was performed for the buccal dehiscence defect



5 Grafting the allograft, ICB cancellous bone at peri-implant and xenograft, THE Graft at the surrounding area. Suture after applying the resorbable membrane, EZ-cure



6 Re-entry for the second surgery (15.11.16)

It is a case with implant placement for mandibular molar where horizontal bone defect was observed. After the implant placement, an additional GBR was performed on the buccal side with allograft ICB cancellous bone, xenograft THE Graft, and the resorbable membrane, EZ-cure. After 4 months, the second surgery was conducted and prosthesis was loaded. The result was satisfactory clinically.



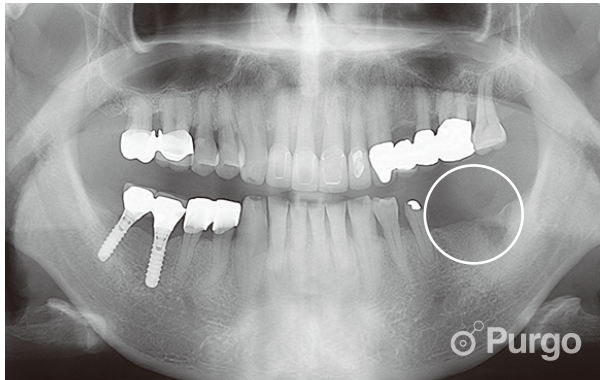
7 Buccal view



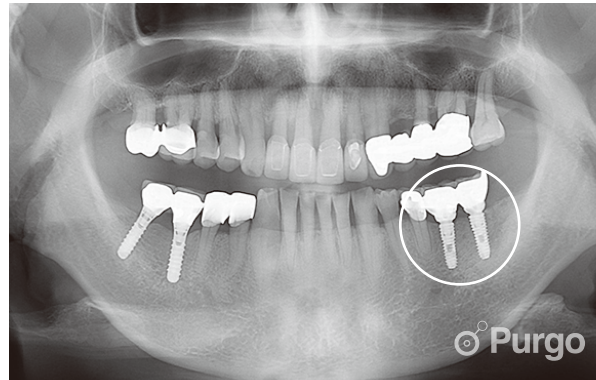
8 Occlusal view of the prosthesis (16,3,9)



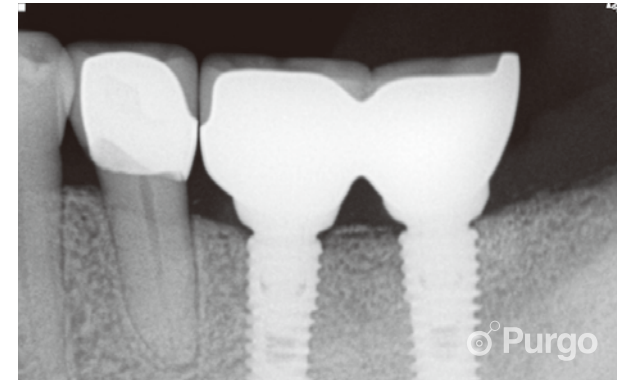
9 Buccal view of the prosthesis



10 Pre-op panorama (15,6,8)



11 Panorama after loading prosthesis (16,1,25)



12 Radiograph after loading prosthesis (16,1,25)

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CASE 52

Case for healing process of the bone defect 4 weeks after Transmucosal GBR at #37

Dr. S. M. Han (Seoul Icheon Dental Clinic)



1 Pre-op clinical photograph (16.3.10)



2 Flap opening after extraction, buccal bone loss is observed (16.3.10)



3 Healing Abutment is placed after implant placement



4 Grafting the bone substitute, THE Graft, and applying the resorbable membrane, BioCover



5 Suture



6 Healing process before removing the suture, 2 weeks after the surgery (16.3.24)

This is a case where transmucosal GBR was performed with implant placement for the self-contained defect. Although there was a large bone defect on the buccal side, a favorable result was observed when re-entry was performed. The superior osteoconductivity of THE Graft and tissue integration function of BioCover evidence that they are optimal biomaterials for transmucosal GBR when there is self-contained defect.



7 4 weeks after the surgery (16.7.14)



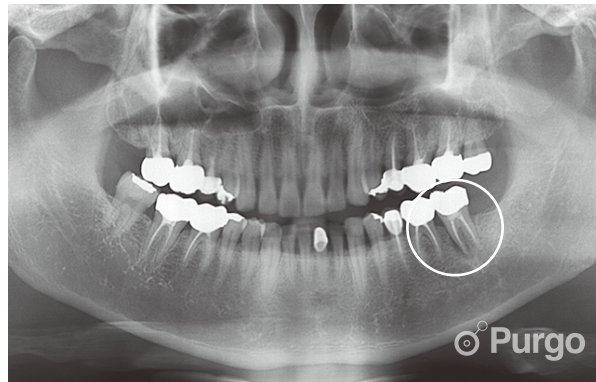
8 4 months after the surgery (16.7.14)



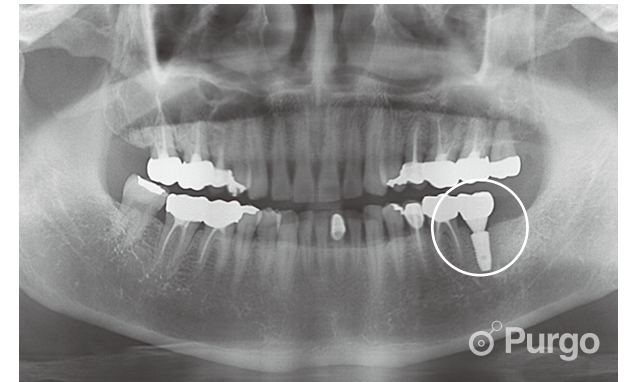
9 Re-entry(16.7.14)



10 Prosthesis (16.8.11)



11 Pre-op panorama (16.2.15)



12 Panorama after the surgery (16.8.11)

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THE Graft 
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