Placement of Implant After Bone Graft Using J Block Allograft

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Securing sufficient alveolar bone is important for a successful implant. Alveolar bone should be augmented to adequate height and width for an implant to satisfy the functional, biological, and aesthetic properties. The subjects of this study were 3 patients with severe bone defects caused by either a periodontal disease or a failure of implants on mandibular posterior tooth, mandibular anterior tooth, and maxillary posterior tooth. The shape of the commercial block allograft (Puros J-Block, Zimmer Dental Inc., Carlsbad, CA) was modified to match the shape of the defect, and resorbable membrane (Puros Pericardium Allograft Membrane, Tutogen Medical GmbH, Germany) was used before suturing the soft tissue. The transplant sites were exposed 4 months later to install the implant. The grafted bone was united with the bone tissue to obtain enough alveolar ridge and to install the implants. Bone allograft used in these cases reduced the need to collect autogenous bone in patients with severe alveolar ridge loss. (Implant Dent 2010;19:21–28)

Key Words: alveolar bone, severe bone defect, resorbable membrane

Because of trauma, severe periodontal diseases, the failure of endodontic treatment, the removal of previous implants, etc., it may be difficult to obtain a bone shape suitable for the placement of implants in many cases.[1–4] To resolve horizontal severe bone defect areas, implant of block pattern could be considered.[5–10]

To obtain the en-block shaped bone, autologous bone transplant of the mandible symphysis area,[11–17] ramus buccal shelf,[11,18–23] tibia,[24,25] ilium,[26–29] and cranium[30,31] of patients are considered as potential donor sites. Nevertheless, in the intraoral cavity, clinical problems caused by the harvest of block autograft are latent dysesthesia, infection, and the reduction of dental viability, and the shape of face may be changed after surgery. In addition, it may be difficult to obtain an appropriate volume of bone.[32] The width of block pattern that could be harvested has been known to be an average of 4 to 5 mm (maximally 6–7 mm) and the height is 2 mm (maximally 3 mm).[33,34] In the case of the ilium, that is an extraoral cavity site where block pattern bones could be obtained, superficial infection, formation of seroma as well as hematoma, hypersensitivity, and gait disturbance may appear. In the tibia case, complications similar to them may be shown.[35,36] Hence, allogenic bones and xenogenic bones are not the only ones used to substitute autologous bones because hydroxylapatite, calcium-phosphate compounds, and other synthetic bones have been developed.[37]

Among the block pattern graft materials that could substitute autologous bones, the biocompatibility of allograft is superior clinically in comparison with other graft materials, and because of the advantage that the volume could be readily obtained in severe bone defect areas, it has been known to be an interesting treatment method among dentists.[2,38]

In this study of three patients who visited the dental hospital in Chosun University, we reported 2 cases that had an allograft bone block graft (Puros J-Block, Zimmer Dental Inc., Carlsbad, CA) inserted to the bone defect area generated after the removal of implants and 1 case that had been performed with a block allograft transplant to the bone defect area developed in the area of the extraction of teeth because of reported severe periodontal diseases.

CASE 1

A 47-year-old female patient visited our hospital and presented the chief complaint of dysesthesias in the right lower lip after the placement of 2 implants to the no. 46 and no. 47 areas in a private clinic 1 week before visiting our hospital. In clinical examination, the deterioration of perception in the lower area was shown. In radiological test, the implant fixture and the inferior alveolar canal were shown to be overlapped. Thus, it could be speculated that during surgery, injury of the inferior alveolar nerve or the mechanical nerve compression by the implant fixture was developed.

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ISSN 1056-6163/10/01901-021
Implant Dentistry
Volume 19 • Number 1

DOI: 10.1097/ID.0b013e3181cc7dee

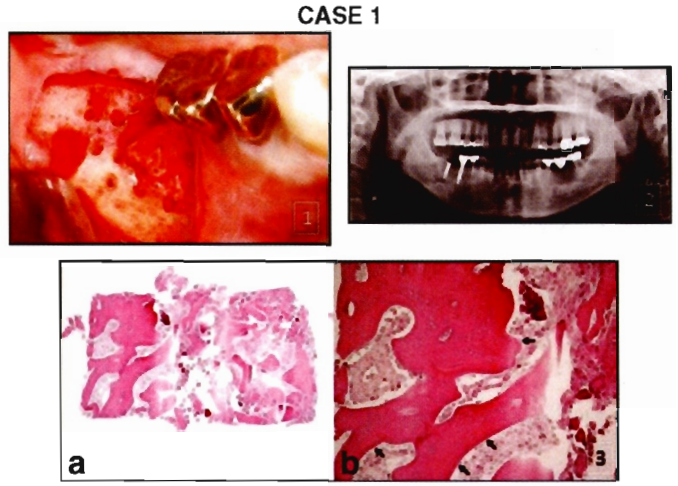

Fig. 1. Transplant of a block allograft to the recipient site.
Fig. 2. Radiograph after the placement of implant.
Fig. 3. Histologic aspect of tissue after 4.5 months of healing. (**a**) Low magnification showed a woven bone with the focal lamellar bone formation (hematoxyline-eosin, original magnification ×40). (**b**) Higher magnification demonstrated the focal lamellar bone formation (hematoxyline-eosin, original magnification ×100).

On the day of visit, the implants were removed, and subsequently for 3 months, physical therapy and drug therapy were administered. Although the dysesthesia of the lower lip was not completely recovered, the patient desired to restore the implant in the no. 47 defect site. To generate the bone volume sufficient to support implants, the necessity of bone transplant was discussed, and the patient selected the use of allogenic bone block to avoid additional surgery sites. The patient signed the consent of implant surgery before operation.

Surgical Process

After performing local anesthesia to expose the residual alveolar ridge, crestal incision, and vertical incision were performed. It remained similar to the bone defect area were implants were removed 3 months ago. Vertical as well as transverse bone grafts to the bone defect area were required, and the use of allogenic bone was decided. Before bone graft, the bone defect area was cleaned, and for the induction of hemorrhage, the cortical bone in the recipient area was perforated. According to the protocol of the manufacturer of block allograft (Puros J-block, Zimmer Dental Inc.), it was hydrated with sterilized saline (0.9%). To insert the hydrated block allograft to the bone defect site, it was cleaned with a high-speed hand piece and a round bur under irrigation cooling.

To remove residual bone fragments from the formed block allograft, it was rinsed clean under sterilized saline irrigation and adapted to the prepared bone defect area (Fig. 1). The bone defect area was filled with the block allograft, and the presence of a sharp margin or corners were assessed. A regenerative collagen membrane (Puros Pericardium Allograft Membrane, Tutogen medical GmbH, German) was placed to protect the bone graft, and soft tissues were sutured without tension with 4-0 suture (Happylon, Happy Smile Inc., Japan). The patient was educated about postsurgical maintenance items, and after surgery, antibiotics, analgesic, and oral gargle solution were administered and prescribed. After the healing of soft tissues, the suture was removed.

During the postsurgical healing period, infection, the dehiscence of wound, and other clinical complications did not develop. Special problems were not shown at the evaluation of block allograft by radiographs performed after 2 months before the exposure of the graft area.

Before the placement of implants, the minimum 4.5 months of healing period of the graft was allowed. Under local anesthesia, for the first implant surgery, similar to the time of graft, incision, and the design of flap were performed. The result of the exposure of the graft site showed a well-fused block allograft. After obtaining consent from the patient, tissues were obtained from the area where the transplant of block allograft was performed. A screw-type implant, 4 × 11.5 mm in size and resorbable blast media surface treatment (USII, Osstem, Seoul, Korea) was placed (Fig. 2). After the placement of implants, similarly, the transplanted block allograft remained without separation or destruction.

All specimens were fixed in 10% formalin for 24 hours and decalcified in Calci-Clear Rapid (National Diagnostics, Atlanta, GA) for 12 hours. The tissue were then rinsed in flowing water, treated with Hypercentre XP tissue processor (Shandon, Cheshire, UK), embedded in paraffin, sectioned to a thickness of 4.0 and 5.0 μm, and then followed by staining with hematoxylin-eosin. Using a light microscope to evaluate the stained sections, all images were captured using a MagnaFire digital camera system (Optronics, Goleta, CA). The density of newly formed bone, proportions of lamellar and woven bone, and residual graft materials were measured and analyzed using a Visus Image Analysis System (Image & Microscope Technology, Daejon, Korea).

Active new bone formation was shown, and the lamellar bone that plays an important role of supporting woven bones and implants could be detected. Comparing the woven bone, the lamellar bone, and implant chips, there was an observed ratio of 72:24:4 (Fig. 3).

Case 2

A 56-year-old male patient presented the chief complaint of the fracture of the implant screw in the no. 26 area among the implants placed in the no. 26 and no. 27 area placed in a private clinic 15 years ago. The result of clinical test showed the fracture of the implant screw in the no. 26 area, and the removal of the fixture was decided (Fig. 4). After the removal of the fixture, bone graft was performed,

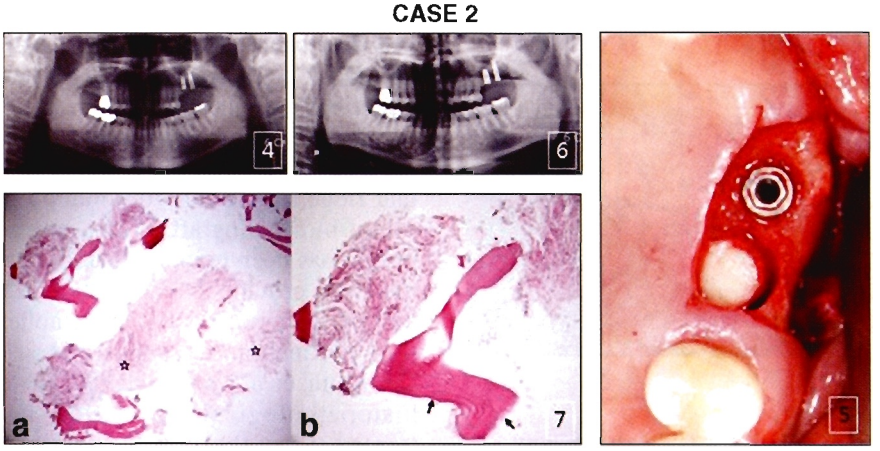

Fig. 4. Radiograph at the initial diagnosis.
Fig. 5. Transplant of block allograft to the recipient area.
Fig. 6. Radiograph after the placement of implant.
Fig. 7. Histologic aspect of the tissue after 4 months of healing. (**a**) Low magnification showed the trabecular bone formation with extensive fibrosis (hematoxyline-eosin, original magnification ×40). (**b**) The trabecular bone showed the mature lamellation (hematoxyline-eosin, original magnification ×100).

and the placement of implant after 4 months was planned.

Surgical Process

After performing local anesthesia for the exposure of the residual alveolar ridge, crestal incision and vertical incision were performed. Using a 6-mm trephine bur, the implant fixture in the no. 26 area was removed. A block allograft (Puros J-block, Zimmer Dental Inc.) was prepared, and according to the protocol of the manufacturer, it was rehydrated with sterilized saline (0.9%). The rehydrated block allograft was placed to the defect area (Fig. 5). In the space between the defect area and the implants, block allograft was ground and grafted. A regenerative collagen membrane (Puros Pericardium Allograft Membrane, Tutogen medical GmbH, German) was used, and to the distal area of the no. 27 implant, a bone tack was applied. Soft tissues were sutured without tension with 4-0 suture (Happylon, Happy Smile Inc., Japan). The patient was educated about postsurgical maintenance items, and after surgery, antibiotics, analgesic, and oral gargle solution were administered and prescribed. The suture was removed after the healing of the soft tissues.

On radiographs taken after 2 months, special problems in the graft area were not detected. Four months after block allograft, the implant first surgery was performed. Under local anesthesia, incision and the elevation of flap were performed. The result of the exposure of the graft area showed a well-fused pattern of the transplanted block allograft, and after obtaining consent from the patient, tissues were harvested from the area performed block allograft. A screw type implant, 5 × 10 mm in size and TiUnite surface treatment (MK III, Nobel Biocare, Göteborg, Sweden) was placed (Fig. 6).

By the method identical to the case 1, histopathological examination was performed. The defect area was filled with newly formed bone composed of woven bone and lamellar bone. Locally, granulomatous infection and implants were almost absorbed and presented as a powder pattern. The defect area was filled with new bone formation and some residual implant chips. Proportional ratio of woven bone versus lamellar bone versus implant chips was 36:58:6 (Fig. 7).

CASE 3

A 62-year-old male patient visited our hospital with the chief complaint of discomfort of the teeth. In clinical examination, 3 degrees of mobility level was observed, and in radiological test, a pattern of the severe resorption of the alveolar bone in the vicinity of the no. 43 was shown. The extraction of no. 43 and the placement of implant 2 months after the extraction were decided. On the day of visit, the extraction of no. 43 was performed.

Surgery Procedure

Two months after the extraction of no. 43, for the placement of implant, a flap was reflected under local anesthesia. The extraction socket was filled with granulation tissues, and after the removal of the granulation tissues, a severe bone defect area was observed (Fig. 8). Because of the burden of the second surgery, the patient did not want autologous bone graft, and it was determined that the vertical and transverse augmentation of the defect area were required, and thus, bone graft using a block allograft was decided. A block allograft (Puros J-block, Zimmer Dental Inc.) was used, and the graft procedure was identical to the case 1 (Fig. 9). After graft, a regenerative collagen membrane (Puros Pericardium Allograft Membrane, Tutogen medical GmbH, German) was used and soft tissues were sutured without tension using 4-0 suture (Happylon, Happy Smile Inc., Japan). The patient was educated about postsurgical maintenance items, and after surgery, antibiotics, analgesics, and oral gargle solution were administered and prescribed. The suture was removed after the healing of soft tissues.

The first implant surgery (Paragon, Zimmer Dental Inc.), that is 3.7 × 11.5 mm in size, was performed (Fig. 10), 4.5 months after block allograft. Under the consent of the patient, tissues were harvested in the area performed block allograft. The transplanted block allograft showed a good healing pattern.

By the method identical to the case 1, histopathological examination and microscopic examination were performed, and among relatively well-organized cavernous bones, 62% of the lamellar bone was shown (Fig. 11).

DISCUSSION

Block allografts are harvested from the ilium of cadaver, and the

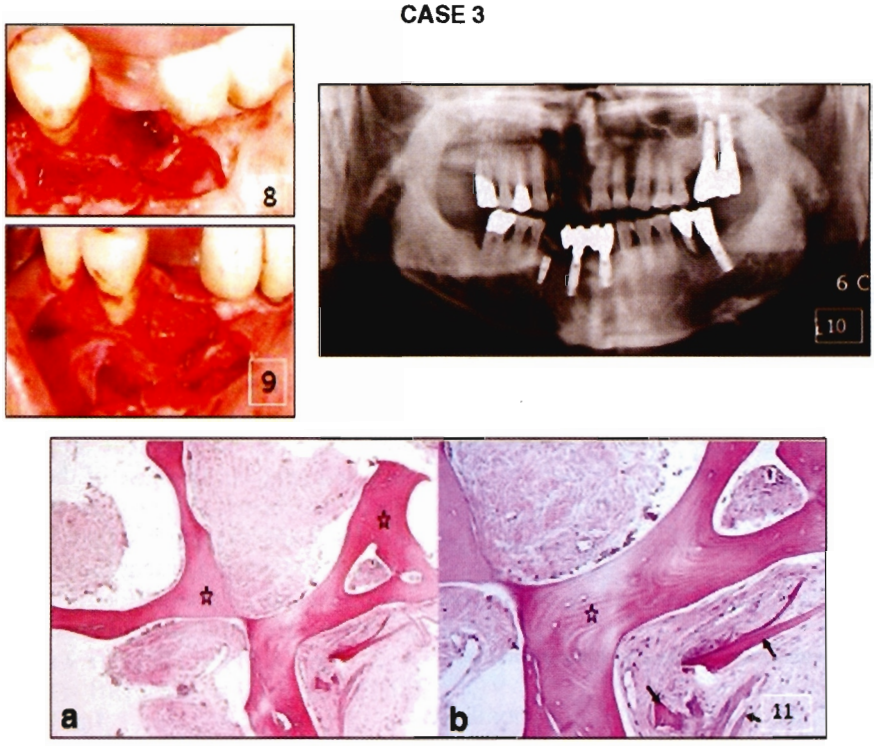

Fig. 8. Three months after the extraction of tooth.
Fig. 9. Transplant of block allograft to the recipient site.
Fig. 10. Radiograph after the placement of implant.
Fig. 11. Histologic aspect of the tissue after 4.5 months of healing. (**a**) Low magnification showed relatively well-organized trabecular bone formation (hematoxyline-eosin, original magnification ×100). (**b**) Higher magnification showed the lamellar bone with resorbing implant chips (hematoxyline-eosin, original magnification ×200).

donors are determined according to a strict protocol. The disease history of donors and their family, social history were examined, whereas donors with infectious diseases or malignant diseases are excluded. Tissues are harvested by the American Association of Tissue Banks in sterile condition and stored 24 hours after death. During the manufacturing treatment process (Tutoplastprocess: Tutogen Medical, Inc., Neunkirchen, Germany), all fats and the bone marrow are removed by low-level gamma radiation (17.8 GY), and the essential component is maintained as it is. In addition, collagen and minerals are abundant, and hepatitis B and C antigen and antibody, human immunodeficiency viruses 1 and 2, bacteria, and virus are all removed.[39] The shape of block allograft is v shape and is a mixture of cortical bones and cancellous bones. Block allograft uses the corticocancellous bone of individuals with the residual ability of remodeling, and thus, has a healing potential. Collagen, the trabecular pattern, and the multiporous characteristic of the donor area are preserved, and thus the original osseoconduction ability is also preserved.

Allografts provide grafting materials that have the advantages of unlimited supply, minimal antigenicity, and no reported incidents in dentistry of disease transmission.[40,41] Allografts have been used in guided bone regeneration to repair periodontal defects.[1]

There are significant differences in the healing process of autogenous cortical versus autogenous cancellous grafts.[42] Cancellous bone revascularizes faster and is strengthened first by creeping substitution; whereas cortical grafts revascularize slower and remain a mixture of necrotic and living bone for prolonged periods of time. There are also important differences in the mechanical strength from the repair process. Cancellous grafts are strengthened during the repair process, whereas cortical grafts are weakened during repair.[43] It would seem that cancellous block allografts may have some advantages over the cortical block grafts because of faster healing of early wounds.[1]

Keith[38] reported a single case of the augmentation of the width of alveolar ridge from 3 mm to 9 mm by the use of block allograft. In this case report, it has been reported that the graft materials provide the augmentation of the alveolar ridge without complications pertinent to the donor area.

Keith et al[44] reported that in the histopathological evaluation performed 6 months after the transplant of block allograft, fast bone formation was shown since new bones with osteoclasts were observed. The newly deposited osteoid and the cancellous bone trabeculae surrounded a small volume of residual bone graft with the characteristic of the empty lacuna and the absence of osteoclasts. New bones were formed by the trabeculae of reticular bones, and thus, the 2 structures could not be distinguished. Between the residual grafted bone and the trabeculae of new bones, an eosinophilic skeleton near the residual platelet-rich plasma was shown; nonetheless, necrosis findings were not shown.

Leonetti and Koup[2] have reported 4 cases with severe bone defects applied a block allograft for the augmentation of the maxillary alveolar bone. Block allograft was reported to be an effective material that could substitute autologous bones and augment the bone.

Conclusion

These case reports demonstrated the success of alveolar ridge augmentation for the purpose of implant placement using a cancellous block allograft in combination with particulate cortical bone and a resorbable membrane.

The advantages of block allograft are that the number of grafts are unlimited, the second surgery area to harvest autologous bones could be eliminated, and the consent of the patient could be readily obtained. In addition, the cortical bone area provides the framework for strength, and the cancellous bone area quickly vascularizes and achieves remodeling, and thus, in cases applied to the severe vertical and transverse defect area,

sufficient bones for the placement of implants could be obtained, and esthetically, satisfactory results could be obtained. At the time of the placement of implants, the block allograft was fused with the recipient area, and, histopathologically, the formation of new bones was observed. Therefore, at the time of the placement of implants, block allograft could be used as useful materials to compensate for a bone defect in the area of the edentulous alveolar ridge.

Disclosure

The authors claim to have no financial interest, directly or indirectly, in any entity that is commercially related to the products mentioned in this article.

REFERENCES

1. Wallace S, Gellin R. Clinical evaluation of a cancellous block allograft for ridge augmentation and implant placement: A case report. *Implant Dent*. 2008;17:151-158.
2. Leonetti JA, Koup R. Localized maxillary ridge augmentation with a block allograft for dental implant placement: Case reports. *Implant Dent*. 2003;12:217-226.
3. Barber HD, Betts NJ. Rehabilitation of maxillofacial trauma patients with dental Implants. *Implant Dent*. 1993;2:191-193.
4. Wiens JP. The use of osseointegrated implants in the treatment of patients with trauma. *J Prosthet Dent*. 1992;67:670-678.
5. Palmer RMM, Floyd PD, Palmer PJ, et al. Healing of implant dehiscence defects with and without expanded polytetrafluoroethylene membranes: A controlled clinical and histologic study. *Clin Oral Implantol Res*. 1994;5:98-104.
6. Buser D, Dula K, Belser UC, et al. Localized ridge augmentation using guided bone regeneration. II. Surgical procedure in the mandible. *Int J Periodontics Restorative Dent*. 1995;15:10-29.
7. Jovanovic SA, Spiekermann H, Richter EJ. Bone regeneration around titanium dental implants in dehisced defect sites: A clinical study. *Int J Oral Maxillofac Implants*. 1992;7:233-245.
8. Cook SD, Wolfe MW, Saikeld SL, et al. Effect of recombinant osteogenic protein-1 on healing of segmental defects in non-human primates. *J Bone Joint Surg*. 1995;77A;734-750.
9. Reddi AH, Weintroub S, Muthukumaran N. Biological principles of bone induction. *Orthop Clin N Am*. 1987;18:207-212.
10. Mellonig JT, Bowers GM, Bailey RC. Comparison of bone graft materials. Part I. New bone formation with autografts and allografts determined by Strontium-85. *J Periodontol*. 1981;52:291-296.
11. Misch CM, Misch CE, Resnik RR, et al. Reconstruction of maxillary alveolar defects with mandibular symphysis grafts for dental implants: A preliminary procedural report. *Int J Oral Maxilllofac Implants*. 1992;7:360-366.
12. Collins TA, Scand J. Onlay bone grafting in combination with Branemark implants. In: Beirne OR, Worthington P, eds. *Oral and Maxillofacial Surgery Clinics of North America*. Philadelphia, PA: WB Saunders; 1991:893-902.
13. Jenes J, Sendet-Pedersen S. Autogenous mandibular bone grafts and osseointegrated implants for reconstruction of the severely atrophied maxilla: A preliminary report. *J Oral Maxillofac Surg*. 1991;49:1277-1287.
14. Misch CM. Enhance maxillary implant site through symphysis bone graft. *Dent Implantol Update*. 1991;2:101-104.
15. Pikos MA. Buccolingual expansion of the maxillary ridge. *Dent Implantatol Update*. 1992;3:85-87.
16. Jensen J, Sindet-Pedersen S, Oliver AJ. Varying treatment strategies for reconstruction of maxillary atrophy with implants: Results in 98 patients. *J Oral Maxillofac Surg*. 1994;52:210-216.
17. Misch CM, Misch CE. The repair of localized severe ridge defects for implant placement using mandibular bone grafts. *Implant Dent*. 1995;4:261-267.
18. Brånemark PI, Lindström J, Hallén O, et al. Reconstruction of the defective mandible. *Scand J Plast Reconst Surg*. 1975;9:116-128.
19. Misch CM. Comparison of intraoral donor sites for onlay grafting prior to implant placement. *Int J Oral Maxillofac implants*. 1997;12:767-776.
20. Collins TA, Nunn W. Autogenous veneer grafting for improved esthetics with dental implants. *Compendium*. 1994;15:370-376.
21. Pikos MA. Facilitating implant placement with chin grafts as donor sites for maxillary bone augmentation—Part I. *Dent Implantol Update*. 1996;6:89-92.
22. Pikos MA. Alveolar ridge augmentation with ramus buccal shelf autografts and impacted third molar removal. *Dent Implantol Update*. 1999;10:27-31.
23. Misch CM. Ridge augmentation using mandibular ramus bone graft for the placement of dental implants: Presentation of a technique. *Pract Periodontics Aesthet Dent*. 1996;8:127-135.
24. Catone GA, Reimer BL, Mcneir D, et al. Tibial autogenous cancellous bone as an alternative donor site in maxillofacial surgery: A preliminary report. *J Oral Maxillofac Surg*. 1992;50:1258-1263.
25. Breine U, Brånemark PI. Reconstruction of alveolar jaw bone. An experimental and clinical study of immediate and preformed autologous bone grafts in combination with osseointegrated implants. *Scand J Plast Reconst Surg*. 1980;14:23-48.
26. Listrom RD, Symington JM. Osseointegrated dental implants in conjunction with bone grafts. *Int J Oral Maxillofac Surg*. 1988;17:116-118.
27. Brånemark PI. Introduction to osseointegration. In: Brånemark PI, Zarb GA, Albrektsson T, eds. *Tissue-Integrated Prostheses, Osseointegration in Clinical Dentistry*. Chicago, IL: Quintessence; 1985:47-50.
28. Keller EE, Van Roekel NB, Desjardins RP, et al. Prosthetic-surgical reconstruction of the severely resorbed maxilla with iliac bone grafting and tissue-integrated prostheses. *Int J Oral Maxillofac Implants*. 1987;2:155-165.
29. Kahnberg KE, Nystrom E, Bartholdsson L. Combined use of bone grafts and Brånemark fixtures in the treatment of severely resorbed maxillae. *Int J Oral Maxillofac Implants*. 1989;4:297-304.
30. Gary JJ, Donovan M, Garner FT, et al. Rehabilitation with calvarial bone grafts and osseointegrated implants after partial maxillary resection: A clinical report. *J Prosthet Dent*. 1992;67:743-746.
31. Donovan MG, Dickerson NC, Hanson LJ, et al. Maxillary and mandibular reconstruction using calvarial bone grafts and Branemark implants: A preliminary report. *J Oral Maxillofac Surg*. 1994;52:588-594.
32. Petrungaro PS, Amar S. Localized ridge augmentation with allogenic block grafts prior to implant placement: Case reports and histologic evaluations. *Implant Dent*. 2005;14:139-148.
33. Zins JE, Whitaker LA. Membranous vs bone autografts: Implications for craniofacial reconstruction. *Surg Forum*. 1979;30:521-523.
34. Urist MR. Surface-decalcified allogeneic bone (SDAB) implants. A preliminary report of 10 cases and 25 comparable operations with undecalcified lyophilized bone implants. *Clin Orthop Relat Res*. 1968;56:37-50.
35. Kessler P, Thorwarth M, Bloch-Birkholz A, et al. Harvesting of bone from the iliac crest—comparison of the anterior and posterior sites. *Br J Oral Maxillofac Surg*. 2005;43:51-56.
36. O'Keeffe RM Jr, Riemer BL, Butterfield SL. Harvesting of autogenous cancellous bone graft from the proximal tibial metaphysis. A review of 230 cases. A review of 230 cases. *J Orthop Trauma*. 1991;5:469-474.
37. Hämmerle CH, Chiantella GC,

Karring T, et al. The effect of a deproteinized bovine bone mineral on bone regeneration around titanium dental implants. *Clin Oral Implants Res*. 1998;9:151-162.

38. Keith JD Jr. Localized ridge augmentation with a block allograft followed by secondary implant placement: A case report. *Int J Periodontics Restorative Dent*. 2004;24:11-17.

39. Feuille F, Knapp CI, Brunsvold MA, et al. Clinical and histologic evaluation of bone-replacement grafts in the treatment of localized alveolar ridge defects. Part 1: Mineralized freeze-dried bone allograft. *Int J Periodontics Restorative Dent*. 2003;23: 29-35.

40. Mellonig JT. Donor selection, testing, and inactivation of the HIV virus in freeze-dried bone allografts. *Pract Periodontics Aesthet Dent*. 1995;7: 13-22.

41. Quattlebaum JB, Mellonig JT, Hensel NF. Antigenicity of freeze-dried cortical bone allograft in human periodontal osseous defects. *J Periodontol*. 1988;59: 394-397.

42. Burchardt H. The biology of bone graft repair. *Clin Orthop Relat Res*. 1983; 174:28-42.

43. Goldberg VM, Stevenson S. Natural history of autografts and allografts. *Clin Orthop Relat Res*. 1987;225: 7-16.

44. Keith JD Jr, Petrungaro P, Leonetti JA, et al. Clinical and histologic evaluation of a mineralized block allograft: Results from the developmental period (2001–2004). *Int J Periodontics Restorative Dent*. 2006;26:321-327.

ID Abstract Translations

GERMAN / DEUTSCH

AUTOR(EN): Su-Gwan Kim, DDS, PhD, Jin-Sung Park, DDS, Sung-Chul Lim, MD, PhD

Einpflanzung von Implantaten nach Knochentransplantierung unter Verwendung eines J-Block-Allotransplantats

ZUSAMMENFASSUNG: Für eine erfolgreiche Implantierung ist das Vorhandensein eines ausreichenden Maßes an alveolärem Knochengewebe äußert wichtig. Bei einer Implantatsetzung sollte das alveoläre Knochengewebe bis zu einer ausreichenden Höhe und Breite aufgebaut werden, um die Ansprüche an die funktionellen, biologischen und ästhetischen Eigenschaften zu befriedigen. Im Fokus dieser Studie waren drei Patienten mit schweren Knochengewebsdefekten, die entweder durch eine periodontale Erkrankung oder ein Versagen von Implantaten an den hinteren Zähnen des Unterkiefers, den vorderen Zähnen des Unterkiefers sowie den hinteren Zähnen des Oberkiefers hervorgerufen worden waren. Die Form des im Handel erhältlichen Block-Allotransplantats (Puros J-Block, Zimmer Dental Inc., Carlsbad, CA) wurde verändert, so dass es sich der Form des Defekts anglich. Außerdem wurde vor Nähen des Weichgewebes eine resorbierbare Membrane (Puros Pericardium Allotransplantat Membrane, Tutogen Medical GmbH, Deutschland) verwendet. Die Transplantierungsbereiche wurden nach vier Monaten zur Einbringung des Implantats geöffnet. Das transplantierte Knochengewebe hatte sich mit dem natürlich vorhandenen Knochengewebe verbunden, um einen ausreichenden alveolären Kamm zu bilden und damit die Implantierung zu ermöglichen. Die Verwendung eines Knochen-Allotransplantats in diesen Fällen verringerte die Notwendigkeit für eine Sammlung autogenen Knochengewebes bei Patienten mit schwerwiegendem Verlust im alveolären Kammbereich.

SCHLÜSSELWÖRTER: Alveoläres Knochengewebe, schwerwiegender Knochendefekt, resorbierbare Membrane

SPANISH / ESPAÑOL

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La colocación del implante después del injerto de hueso usando el aloinjerto J block

ABSTRACTO: Lograr un hueso alveolar suficiente es importante para un implante exitoso. El hueso alveolar debe aumentarse para lograr una altura y ancho adecuado para que un implante pueda satisfacer las propiedades funcionales, biológicas y estéticas. Los sujetos de este estudio fueron tres pacientes con severos defectos óseos causados por enfermedades periodónticas o falla de implantes en dientes posteriores de la mandíbula, dientes anteriores de la mandíbula y dientes posteriores del maxilar. La forma del aloinjerto comercial en bloque (Puros J-Block, Zimmer Dental Inc., Carlsbad, CA) fue modificada para reproducir la forma del defecto y se usó una membrana reabsorbible (Puros Pericardium Allograft Membrane, Tutogen Medical GmbH, Alemania) antes de suturar el tejido suave. Los lugares del trasplante fueron expuestos cuatro meses después a la instalación del implante. El hueso injertado se unió al tejido óseo para poder obtener una suficiente cresta alveolar para instalar los implantes. El aloinjerto de hueso usado en estos casos redujo la necesidad de recolectar hueso autógeno en pacientes con pérdidas severas de la cresta alveolar.

PALABRAS CLAVES: Hueso alveolar, defecto severo en el hueso, membrana reabsorbible

PORTUGUESE / PORTUGUÊS

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Colocação de Implante após Enxerto Ósseo Usando Enxerto Aloplástico J block

RESUMO: Garantir osso alveolar suficiente é importante para um implante bem-sucedido. O osso alveolar deve ser aumentado para obter altura e largura adequadas para um implante satisfazer as propriedades funcionais, biológicas e estéticas. Os voluntários deste estudo eram três pacientes com defeitos ósseos graves causados ou por doença periodontal ou falha de implantes em dente mandibular posterior, dente mandibular anterior e dente maxilar posterior. A forma do enxerto aloplástico de bloco comercial (Puros J-Block, Zimmer Dental Inc., Carlsbad, CA) foi modificada para se encaixar na forma do defeito e a membrana reabsorvível (Puros Pericardium Allograft Membrane, Tutogen Medical GmbH, Germany) foi usada antes de suturar o tecido mole. Os locais de transplante foram expostos quatro meses mais tarde para instalar o implante. O osso enxertado foi unido com o tecido ósseo a fim de obter suficiente rebordo alveolar e instalar os implantes. O enxerto aloplástico usado nesses casos reduziu a necessidade de coletar osso autógeno em pacientes com grave perda de rebordo alveolar.

PALAVRAS-CHAVE: Osso alveolar, defeito ósseo grave, membrana reabsorvível

RUSSIAN / РУССКИЙ

АВТОРЫ: Su-Gwan Kim, доктор хирургической стоматологии, доктор философии, Jin-Sung Park, доктор хирургической стоматологии, Sung-Chul Lim, доктор медицины, доктор философии

Установка имплантатов после проведения костной трансплантации с применением аллотрансплантата J block

РЕЗЮМЕ. Обеспечение наличия достаточного объема костной массы альвеолярной кости важно для успешной интеграции имплантата. Необходимо произвести наращивание альвеолярной кости до достаточной для имплантации высоты иширины, чтобы обеспечить требуемые функциональные, биологические и эстетические свойства. Участниками данного исследования стали три пациента с серьезными дефектами кости, вызванными либо пародонтитом, либо отторжением имплантатов на месте нижнего коренного, нижнего переднего и верхнего коренного зубов. Форма предоставленных аллотрансплантатов (Puros J-Block®, Zimmer Dental Inc., Карлсбад, Калифорния) была изменена таким образом, чтобы соответствовать форме дефекта, а до наложения швов на мягкие ткани была использована рассасывающаяся мембрана (Puros Pericardium Allograft Membrane, Tutogen Medical GmbH, Германия). Места трансплантации были открыты дляустановки имплантатов четыре месяца спустя. Трансплантированная кость и собственная костная ткань были объединены, чтобы альвеолярный гребень получил объем, достаточный для установки имплантатов. Костный аллотрансплантат, использованный в этих случаях, снизил необходимость взятия аутотрансплантата у пациентов с серьезной потерей объема альвеолярного гребня.

КЛЮЧЕВЫЕ СЛОВА: альвеолярная кость, серьезный костный дефект, рассасывающаяся мембрана

TURKISH / TÜRKÇE

YAZARLAR: Su-Gwan Kim, DDS, PhD, Jin-Sung Park, DDS, Sung-Chul Lim, MD, PhD

J block Allogrefti Kullanılan Kemik Greftinden Sonra İmplant Yerleştirme

ÖZET: Bir implantın başarılı olabilmesi için yeterli alveoler kemik bulunması önemlidir. Bir implantın işlevsel, biyolojik ve estetik gereksinimleri karşılaması için alveoler kemik yeterli yükseklik ve genişliğe büyütülmelidir. Bu çalışmaya, ya bir periodontal hastalık ya da alt çenedeki posterior veya anterior diş implantı ve maksiller posterior diş implantı başarısızlığı nedenleriyle ciddi kemik defektleri olan üç hasta alındı. Blok allogreftinin (Puros J-Block, Zimmer Dental Inc., Carlsbad, CA, ABD) ticari þekli, defektin þekline uymak üzere deðiþtirildi, ve yumuþak dokuda sütür atýlmadan önce rezorbabl membran (Puros Pericardium Allograft Membrane, Tutogen Medical GmbH, Almanya) kullanıldı. Transplant yerleri dört ay sonra açılarak implant yerleştirildi. Greftlenmiş kemik, yeterli bir alveoler sırt elde etmek ve implantları yerleştirmek için kemik dokusuyla birleştirildi. Bu olgularda kullanılan kemik allogrefti, alveoler sırtta ciddi kaybı olan hastalarda otojen kemik toplama gereksinimini ortadan kaldırdı.

ANAHTAR KELÝMELER: Alveoler kemik, ciddi kemik defekti, rezorbabl membran

JAPANESE / 日本語

J block®同種移植片を用いた骨移植後のインプラント埋入

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研究概要:
充分な歯槽骨確保はインプラントの成功には必定である。インプラントが機能面や生体面に加え審美面での特性を満たすには、歯槽骨を適切な骨高径と骨幅まで増大しなくてはならない。当研究対象は歯周病あるいは下顎骨臼歯そして下顎骨前歯また上顎骨臼歯部位のインプラント失敗に起因した重度骨組織欠陥がみられる3名の患者である。市販ブロック同種移植片(Puros J-Block®, Zimmer Dental Inc., Carlsbad, CA)の形状を欠陥形状に合わせて部分修正し、軟組織縫合前に吸収性メンブレーン (Puros Pericardium Allograft Membrane, Tutogen Medical GmbH, Germany) を用いた。4ヶ月後移植部位を露出しインプラントを埋入した。移植骨と骨組織は結合しインプラント埋入に充分な顎堤が得られた。このケースで利用した同種移植骨片は、重度顎骨損失患者から自家骨採取の必要性を低減した。

キーワード: 歯槽骨、重度骨欠陥、吸収性メンブレーン

CHINESE / 中国語

使用 **J block®** 進行異體骨移植後的植體置入

作者：Su-Gwan Kim, DDS, PhD, Jin-Sung Park, DDS, Sung-Chul Lim, MD, PhD

摘要：
取得足夠齒槽骨對種植成功相當重要。齒槽骨應該增高至足夠的高度與寬度以利植體達到功能、生物與美觀的特性。本研究的對象為三位因牙周病，或下頷後齒、下頷前齒與上頷後齒種植失敗導致嚴重骨缺損的患者。商業塊體異體移植物 (Puros J-Block®, Zimmer Dental Inc., Carlsbad, CA) 的形狀已經修改以符合缺損的形狀，而可吸收膜 (Puros Pericardium Allograft Membrane, Tutogen Medical GmbH, Germany) 則在縫合軟組織前使用。移植部位暴露四個月後安裝植體。移植骨與骨組織結合以獲得足夠的齒槽脊並安裝植體。用於這些情況的異體骨移植物可降低從齒槽脊嚴重流失病患取得自體骨的需求。

關鍵字：齒槽骨、嚴重骨缺損、可吸收膜

KOREAN / 한국어

J block® 이식편 사용하여 골이식 후 임플란트 식립

저자: 김수관 (Su-Gwan Kim), DDS, PhD, 박진성 (Jin-Sung Park), DDS, 임성철 (Sung-Chul Lim), MD, PhD

요약:
성공적인 임플란트를 위해서는 충분한 치조골의 확보가 중요하다. 임플란트가 기능적, 생물학적 및 심미적 속성을 충족시키기 위해서는 치조골이 충분한 높이와 폭으로 증대되어야 한다. 본 연구의 연구대상은 치조질환 또는 하악 후방치, 하악 전방치 및 상악 전방치 부위 임플란트 실패에 기인한 심각한 골결손이 있는 3명의 환자였다. 시판 블록 동종 이식편(Puros J-Block®, Zimmer Dental Inc., Carlsbad, CA)의 형태를 결손부위 모양에 맞춰 변형시켰고, 연조직 봉합전 흡수성막(Puros Pericardium Allograft Membrane, Tutogen Medical GmbH, Germany)을 사용하였다. 이식부위는 이후 임플란트 식립을 위해 4개월간 노출시켜두었다. 이식골은 치조제(alveolar ridge)를 충분히 획득하기 위해, 그리고 임플란트 식립을 위해 골조직과 연결되었다. 이들 증례에 사용된 골 동종 이식편은 심각한 치조제 손실 환자에서의 자가골 채취에 대한 필요도를 감소시켰다.

키워드: 치조골, 심각한 골결손, 흡수성막