



Case report

Replacing a failed implant adjacent to the implant-supported restoration in the anterior region after ridge augmentation procedure

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Replacing a failed implant adjacent to the implant-supported restoration in the anterior region after ridge augmentation procedure

Background: Dental professionals will have to deal with more implant failure and related complications due to the increase in popularity of this form of therapy.

Objectives: There have been only a few reports on replacing failed implants at the same sites. This report may provide more detailed information about the re-implantation procedure and the results to the operator and less motivated patient.

Materials and methods: The implant failure occurred after a 3-year period of loading in the anterior region, next to an implant-supported prosthesis. Ridge augmentation was performed with staged placement of an implant.

Results: The implant was re-installed after ridge augmentation with deproteinised bovine bone and absorbable membrane, with the implant-supported prosthesis functioning well up to the final evaluation.

Conclusion: This case report shows the possibility of treating the failed implant in the older population using a staged approach and it may give more detailed information about the re-implantation procedure and results to the operator and less motivated patient. Further evaluations over longer periods are necessary to establish whether this procedure offers long-term benefits to patients.

Keywords: re-implantation, failure, dental implant, ridge augmentation, deproteinised bovine bone.

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Introduction

Although reported success rates for dental implants are high, dental professionals will have to deal more with implant failure and related complications due to the increase in popularity of implant therapy¹. There have been only a few reports on replacing failed implant at the same site²⁻⁴. Immediate replacement with a larger-diameter dental implant has been suggested as an option for a failed implant³. However, it is challenging to achieve an aesthetic result with anterior teeth having soft and hard tissue discrepancies from greater bone loss in patients who have lost implants following loading⁵.

In this case report, the implant failure occurred in the anterior region next to the implant-supported prosthesis after a 3-year period of loading.

The implant was re-installed after ridge augmentation with deproteinised bovine bone and absorbable membrane. This case report shows the possibility of treating a failed implant in the older population using a staged approach and it may provide more detailed information about the re-implantation procedure and the results to the operator and less motivated patient.

Case report

A 61-year-old female was referred to the Department of Periodontology, at Seoul National University Dental Hospital, seeking periodontal evaluation and treatment. The patient had a non-contributory medical history and was not taking any medications that were associated with a compromised soft tissue healing response.

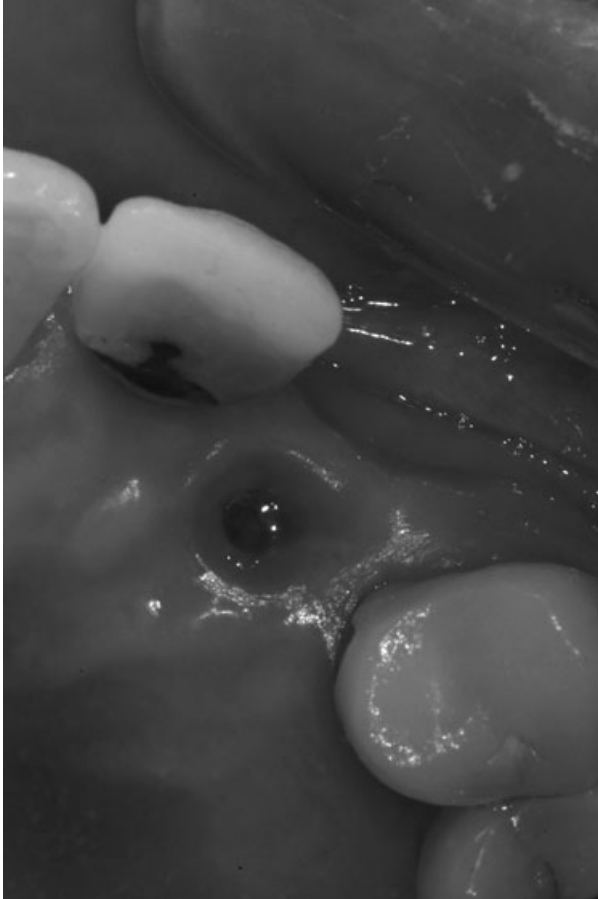


Figure 1 Initial occlusal view of previously installed implant.

The upper left canine was missing and the implant-supported prosthesis had failed after a 3-year period of loading. The upper lateral incisor was restored with an implant-supported prosthesis and the upper left first premolar had a porcelain-fused-to-metal crown (Fig. 1). The patient was given a detailed explanation concerning the present state, alternative treatment plans and the procedure, and informed consent was obtained from the patient. Ridge augmentation was planned with staged placement of an implant. The soft tissue was very thin and the width of keratinised tissue on the buccal side was 1–2 mm.

Prior to surgery the patient rinsed for 60 s with 0.12% chlorhexidine mouth rinse (Hexamedine, Bukwang, Seoul, Korea). After local anaesthesia was achieved, a full thickness flap was reflected and an attempt was made to remove the soft tissue thoroughly within the socket by curettage (Fig. 2a). A surgical template was used to locate the desired implant position and ridge augmentation was performed accordingly (Fig. 2b). The alveolar

bone was decorticated with a high-speed drill using a no. 2 round bur for the cortical plate.

The buccal defect and the extraction area were grafted with deproteinised bovine bone (Bio-Oss[®], Geistlich Pharm AG, Wolhusen, Switzerland) and a resorbable membrane (Bio-Gide[®], Geistlich Pharm AG) was shaped to completely cover the defect and bone graft in a saddle-like manner (Fig. 2c,d). Primary closure was not attempted and the exposed periosteum was covered with autogenous masticatory mucosa from the left side of the palate. The patient was placed on amoxicillin 500 mg three times per day for 5 days, mefenamic acid 500 mg initially then mefenamic acid 250 mg four times per day for 5 days, and chlorhexidine digluconate 0.12% three times per day for 2 weeks. The patient was told to avoid chewing and tooth brushing the area for the first 2 weeks post-operatively. Two weeks after surgery, the sutures were removed and the grafted area was carefully cleaned with 0.12% chlorhexidine solution (Fig. 3). Healing was uneventful and the patient reported no specific symptoms.

Following 7 months of healing to allow for graft material maturation, re-entry was performed for implant placement (Fig. 4a,b). The width of the ridge was well preserved and the width of keratinised tissue on the buccal side was now 4 mm. The grafted area healed uneventfully and soft tissue maturation was noticeable 3 months after the surgery. The 4.0 × 12-mm implant (Nobel Biocare AB, Göteborg, Sweden) was placed into the bone. The patient was placed on the same medication and given the same care instructions as previously. Figure 5 shows the periapical radiograph taken 4 months after implant installation.

After healing, the implant was uncovered and a healing abutment was placed in the implant. The final implant-supported crown was inserted 6 months after implant installation. The prosthesis was functioning well up to final evaluation without any probing depth and alveolar bone resorption.

Discussion

This report shows the successful treatment of a failed implant with ridge augmentation and staged placement of a new implant. Immediate replacement with a larger-diameter dental implant was not performed in this report because hard and soft tissue discrepancies from the alveolar bone loss were seen and the size of the cavity seemed to be too large to place a second implant³.

The 5-year cumulative success rates for maxillary and mandibular implants are 91.00% and 97.81%,

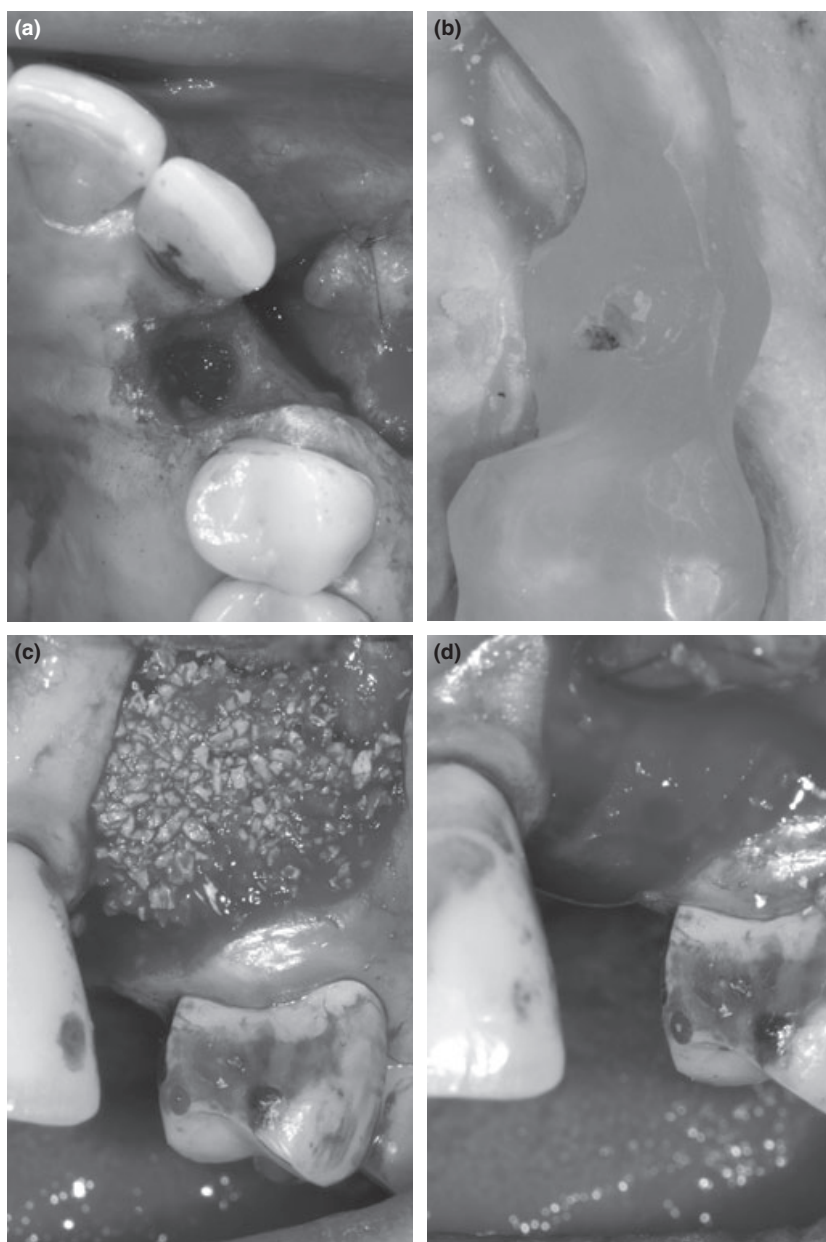


Figure 2 (a) A full thickness flap was reflected and the soft tissue was thoroughly removed within the socket by curetting. (b) A surgical template was used to locate the desired implant position and the ridge augmentation was performed accordingly. (c) The buccal defect and the extraction area were grafted with deproteinised bovine bone. (d) A resorbable membrane was shaped to completely cover the defect.

respectively⁶, but lower success rates were observed for implants placed in older patients⁷. Additionally, replacement of a failed implant may result in a decline in the survival rate and it has been reported that the overall survival rate of single dental implants placed in sites of previously failed implants was 71%⁴. Efforts are being made to improve the treatment outcome for the re-implantation procedures.

Meticulous removal of granulation tissue at the failed implant site was performed before ridge augmentation procedures to improve the outcome^{1,3} and an improved surface (TiUnite surface™; Nobel Biocare, Gothenburg, Sweden) was used in this report compared with the previously used machine

surface. This modified surface is reported with give an enhanced bone response compared with machined implant surfaces^{8,9}, and it was suggested that the success of a replacement may be increased⁴. Short implants (≤ 10 m) were reported to show a lower success rate^{10,11}, and therefore a longer implant of 12 mm was used in the second operation.

Deproteinised bovine bone (DBB) was chosen as a graft material as it has many features similar to natural bone mineral in terms of structure and chemical composition¹². DBB has been shown to have osteo-conductive properties¹³, and the particles of DBB are reported to become integrated with newly formed bone¹⁴.

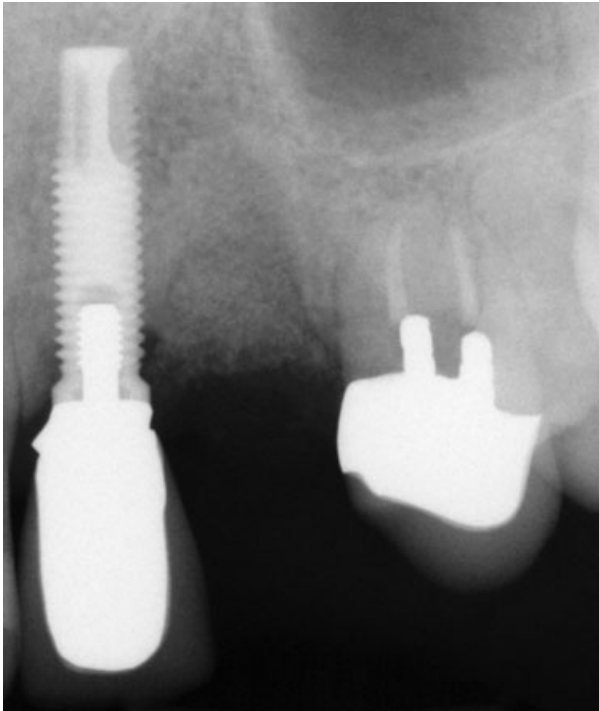


Figure 3 Two-week post-operative periapical radiograph.

Membranes have been used as a barrier to help preserve the space for new bone growth and to prevent the penetration of non-osteogenic soft tissue¹⁵. The absorbable membrane used in this report has been shown to support and promote the proliferation of human periosteal cells¹⁶.

Decortication was carried out to enhance the healing process by promoting bleeding and allow-

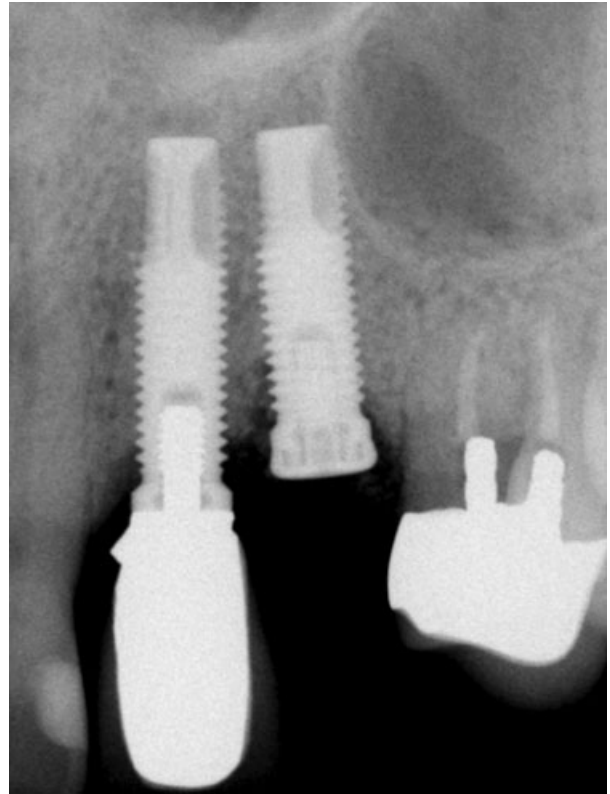


Figure 5 The periapical radiograph taken four months after implant installation.

ing progenitor cells and blood vessels to reach a bone-grafted site more readily¹⁷. There have been several reports supporting the use of decortication prior to performing ridge augmentation^{18,19}.

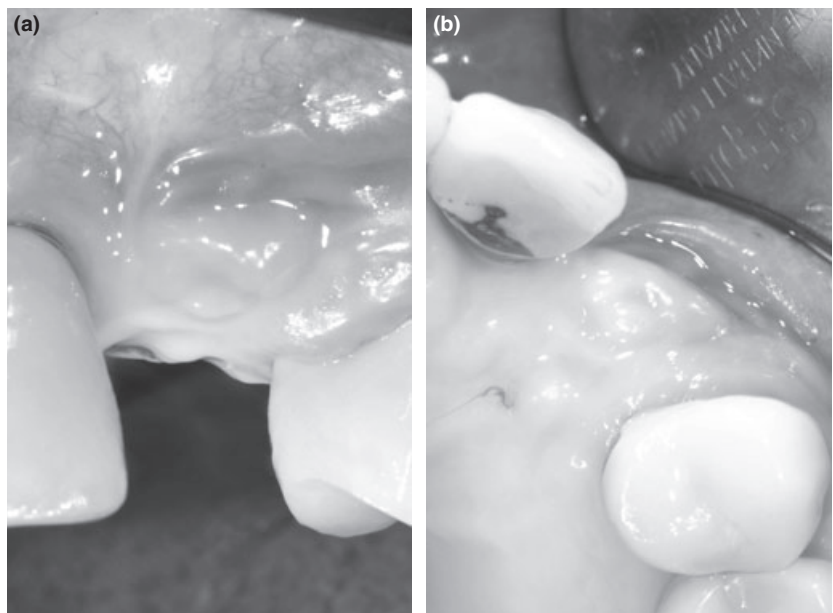


Figure 4 (a) Seven-month post-operative view. (b) Occlusal view showing maturation of the soft tissue.

When an implant fails, patients should be informed of all the possible treatment modalities and give their consent for the most appropriate treatment option for them¹. It could be suggested that a ridge augmentation procedure may be applied to the failed implant site and re-implantation can be successful with an appropriate approach. Further evaluations over longer periods are necessary to establish whether this procedure offers long-term benefits to patients.

Acknowledgement and Disclosure

The authors claim to have no financial interest in any company or any of the products mentioned in this article.

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