

# Ridge Preservation Following Tooth Extraction Using an Absorbable Gelatin Sponge

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## Abstract

**Introduction:** Socket grafting offers a predictable, simple way to conserve the buccolingual and mesiodistal dimensions of the future implant site, and various bone-grafting materials using various techniques have shown promising results.

**Aim:** This case presentation describes the use of an absorbable gelatin sponge in the socket preservation procedure.

**Materials and Methods:** A 47-year-old male patient presented for evaluation of the mandibular right premolar and molar area. The socket walls were scraped with curettes, the gelatin sponge was packed into the extraction socket, and the patient was later treated with dental implants by means of the flapless approach. The prosthesis functioned well without any probing depth or gingival inflammation up to the final evaluation.

**Discussion and Conclusions:** This technique achieved maturation of soft tissue and preserved the width of the alveolar ridge. Therefore, it may be suggested that gelatin sponge is an option for the socket preservation procedure.

*Key Words:* Absorbable gelatin sponge, Dental implants, Tooth extraction, Tooth socket

## Introduction

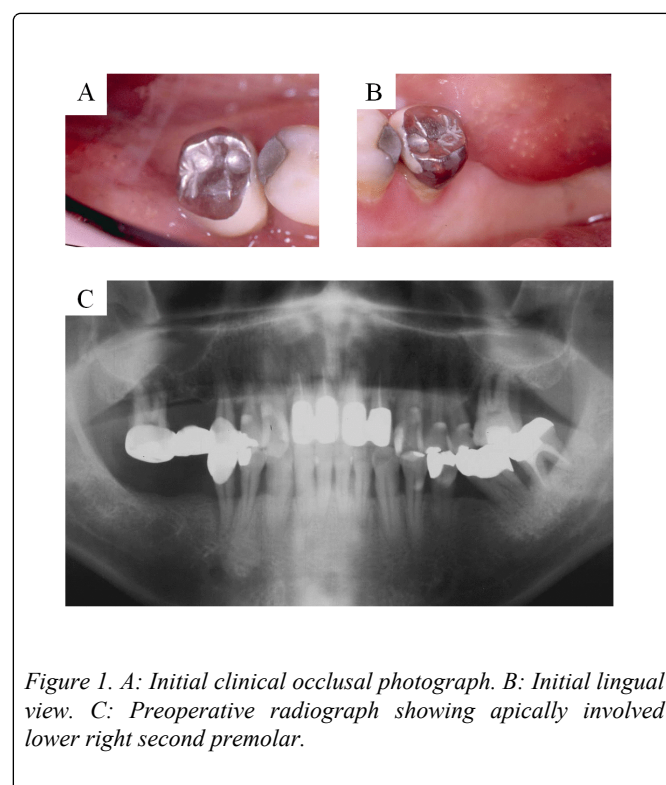
It is well-known that the alveolar bone collapses after extraction and that the reduction in width may be approximately 50 % of the original dimension after 12 months due to the pronounced resorption of the buccal wall [1]. Socket grafting offers a predictable, simple way to conserve the buccolingual and mesiodistal dimensions of the future implant site, and various bone-grafting materials using various techniques have shown promising results [2-3]. The rationale for socket augmentation at the time of extraction involves reducing crestal bone loss, encouraging socket filling, minimizing horizontal ridge resorption, and ultimately reducing or eliminating the need for further ridge augmentation [4].

In this report, an absorbable gelatin sponge was used in the socket preservation procedure and the patient was later treated with dental implantation using the flapless approach.

## Case Presentation

A 47-year-old male patient visited the dental clinic for evaluation of the lower right molar area. The patient had a non-contributory medical history. Clinical and radiographic examination indicated that the right mandibular second premolar was hopeless and that the mandibular first and second molars were missing (*Figures 1A-1C*). A detailed explanation concerning the present state, treatment plans, and procedures was given to the patient, and informed consent was obtained. Dental implantation was planned after consultation.

The patient rinsed for two minutes with a 0.12 % chlorhexidine digluconate solution (Hexamedine, Bukwang, Seoul, Korea) immediately before the surgery. Following an injection of 2 % lidocaine with 1:100,000 epinephrine local anesthetic, a full thickness flap was reflected and two implants were placed in the molar region.



*Figure 1. A: Initial clinical occlusal photograph. B: Initial lingual view. C: Preoperative radiograph showing apically involved lower right second premolar.*

The mandibular second premolar was extracted gently so as not to damage the alveolar ridge. Care was taken to completely remove the soft tissue fragments or granulation tissues. The socket walls were scraped with curettes, and the gelatin sponge (Cutanplast, Mascia Brunelli S.p.a., Milan, Italy) was packed into the extraction socket (*Figures 2A and 2B*). The wound was closed with sutures and the patient was placed on amoxicillin 500 mg 3/day for 5 days, mefenamic acid at 500mg initially and then at 250 mg 4/day for 5 days, and chlorhexidine digluconate 0.12 % 2/day for 2 weeks. The postoperative instructions were given to the patient.

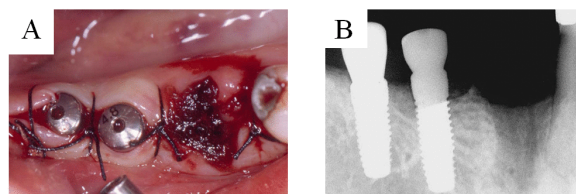


Figure 2. A: Occlusal view showing the collagen wound-dressing material in the extraction socket. B: Radiograph after socket preservation

The patient didn't report any specific symptoms and did not show any adverse clinical signs (Figure 3A). The maturation of soft tissue was achieved with preservation of the width of the alveolar ridge. The implant was placed in the second premolar area after monitoring the healing process radiographically (Figure 3B). No significant reduction of height of alveolar process was noted.

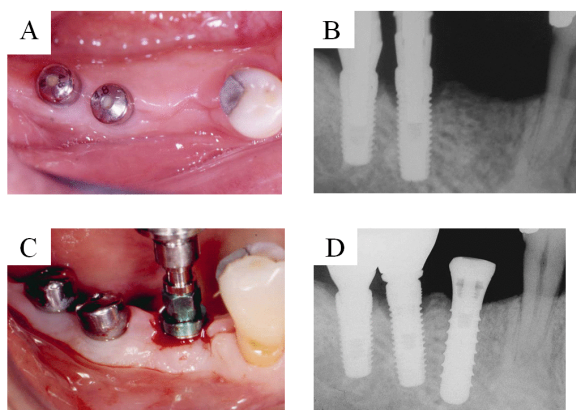


Figure 3. A: The buccal view showing the maturation of soft tissue and preservation of the width of the alveolar ridge. B: The radiograph with the healed extraction socket. C: The implant was placed using a flapless approach. D: Radiograph after implant installation.

The surgical site was assessed by means of visual examination along with periapical and panoramic radiology, and with palpation for bone thickness and morphology. The 4.1 x 14 mm implant (Neoplant, Neobiotech, Seoul, Korea) was placed using the insertion torque of 40 N•cm (Figure 3C and 3D). The prosthesis was delivered six months after implant surgery (Figure 4A). The prosthesis was functioning well without any probing depth or gingival inflammation up to the final evaluation (Figures 4B and 4C).

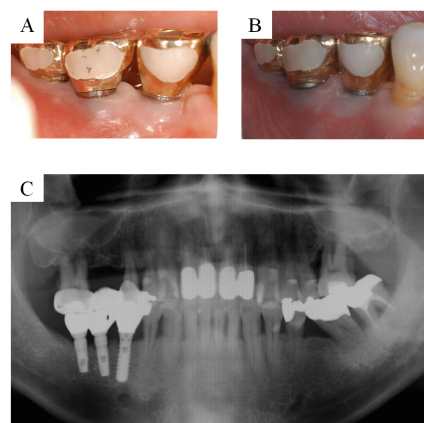


Figure 4. A: Clinical photograph taken after the prosthesis was delivered. B: The buccal view showing the prosthesis in function. C: No resorption around the implants was seen.

## Discussion

In this report, the patients were treated with dental implantation using the flapless approach after socket preservation was performed using the absorbable gelatin sponge.

Gelatin sponge is a biocompatible material [5] and has been used in the treatment of calvarial defects, in socket extraction, and in iliac bone procurement to test bony healing [6-8]. The gelatin sponge material has the characteristics of platelet adhesion induction and releases the content of the  $\alpha$ -granules [5]. Gelatin-based resorbable sponge has been applied as a carrier matrix for mesenchymal stem cells [9]. Recently, several studies have been performed to test the effect of growth factors in extraction sockets using gelatin sponge as a scaffold [8, 10].

The patient was healed with the sufficient width of ridge and keratinized tissue, and this made the flapless approach possible. Flapless approach is reported to generate less postoperative bleeding and less discomfort for the patient with shorter surgery time and reduction of healing time [11]. Fast resorption of the material may not interfere with the healing of the socket [10].

Moreover, the risk of postoperative bleeding after tooth removal was minimal when the extraction sockets were packed with gelatin sponge [12]. Additionally, the use of gelatin sponge may prevent the occurrence of dry socket [13]. However, it should also be noted that implant placement and simultaneously augmentation of sites can be applied with mineralized particulate allograft using collagen membranes [14].

It can be suggested that gelatin sponge is an option for use in socket preservation procedures, although further studies involving a larger number of cases over longer periods are needed to evaluate the clinical effects of this approach.

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