

USE OF HTR SYNTHETIC BONE AS AN AUGMENTATION MATERIAL IN CONJUNCTION WITH IMMEDIATE IMPLANT PLACEMENT: A CASE REPORT

Raymond A. Yukna, DMD, MS
Ana M. Saenz, DDS, MS
Michael Shannon, DDS
Elizabeth T. Mayer, RDH, BS

KEY WORDS

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Raymond A. Yukna, DMD, MS, is with the Department of Periodontics, School of Dentistry, Louisiana State University Health Sciences Center, New Orleans, LA 70119. Address correspondence to Dr Yukna, LSU School of Dentistry, Department of Periodontics, Box 138, New Orleans, LA 70119 (e-mail: ryukna@lsuhsc.edu).

Ana M. Saenz, DDS, MS, is formerly with the Department of Periodontics, School of Dentistry, Louisiana State University Health Sciences Center, New Orleans, LA 70119.

Michael Shannon, DDS, is with the Department of Prosthodontics, School of Dentistry, Louisiana State University Health Sciences Center, New Orleans, LA 70119.

Elizabeth T. Mayer, RDH, BS, is with the Department of Periodontics, School of Dentistry, Louisiana State University Health Sciences Center, New Orleans, LA 70119.

Immediate placement of dental implants (DI) in fresh extraction sockets is associated with remaining voids around the DI and often a partial dehiscence or thin facial alveolar plate. Bioplant HTR synthetic bone (HTR) was used as a ridge preservation/augmentation material in conjunction with this method of DI placement. A 61-year-old white woman requiring extraction of tooth 12 opted for immediate DI placement. HTR was used to fill the remaining socket void and enhance the facial ridge width, and primary closure was attempted with sutures. DI uncovering was performed at about 6 months. Measurements were taken to the nearest 0.5 mm of the internal socket width and total site width at DI placement and uncovering. The internal socket width was essentially maintained (6.8 vs 6.6 mm), and the total ridge width showed a change from 8.7 to 9.1 mm. The results of this case suggest that HTR is a useful adjunct in the placement of immediate DIs for the preservation of ridge width.

INTRODUCTION

The bone resorptive and remodeling process after tooth extraction can be detrimental to subsequent implant placement. The natural tendency for crestal bone resorption and remodeling, resulting in an apical and lingual loss of ridge anatomy, may result in a site that is inadequate dimensionally for implant placement. Alveolar bone loss following tooth loss is an ongoing process because of the loss of functional stimulation, but it is most rapid and significant immediately after tooth re-

moval.¹⁻³ Prosthetic reconstruction and replacement of teeth (and associated structures) becomes more difficult (and often unsatisfactory) when anatomic deformities in the jaw bone ridges occur. Dental implant placement can be compromised or contraindicated because of a lack of proper hard and soft tissue contours.³⁻⁵

To fulfill both functional and aesthetic requirements, it may be necessary to plan immediate implant placement in concert with procedures that contribute to the preservation of ridge width and height as well as soft tissue

	Preoperative (mm)	Uncovering (mm)
Mean internal ridge width	6.8	6.6
Mean total	8.7	9.1

dimensions. Available evidence suggests that alveolar bone resorption can be reduced, at least initially, by surgical techniques employed at the time of tooth removal. Socket augmentation techniques appear to be of benefit in preserving bone dimensions.⁶⁻¹¹

Successful immediate implant placement into a fresh extraction site depends on proper restorative planning, the health of the adjacent teeth,

absence of infection, and the quantity and quality of the adjacent soft and hard tissue. Indications and contraindications for placement of implants into extraction sites have been extensively documented.¹²⁻¹⁶

A specific synthetic bone substitute (HTR; Bioplant HTR, Bioplant, Norwalk, Conn) that is a biocompatible microporous composite of PMMA (poly-methyl-methacrylate), PHEMA (poly-hydroxyl-

ethyl-methacrylate), and calcium hydroxide has shown effectiveness in treating periodontal defects and other oral bone loss problems.¹⁷⁻²⁷ This case report describes the use of HTR graft material in conjunction with the immediate placement of a dental implant.

MATERIALS AND METHODS

A 61-year-old white woman presented to the Louisiana State University School of Dentistry with an endodontic failure and vertical fracture on tooth 12, which was treatment planned for extraction and immediate placement of a dental implant. After obtaining informed consent, tooth 12 was extracted under local anesthesia using periostomes in an attempt to preserve facial and lingual bone plates. The socket

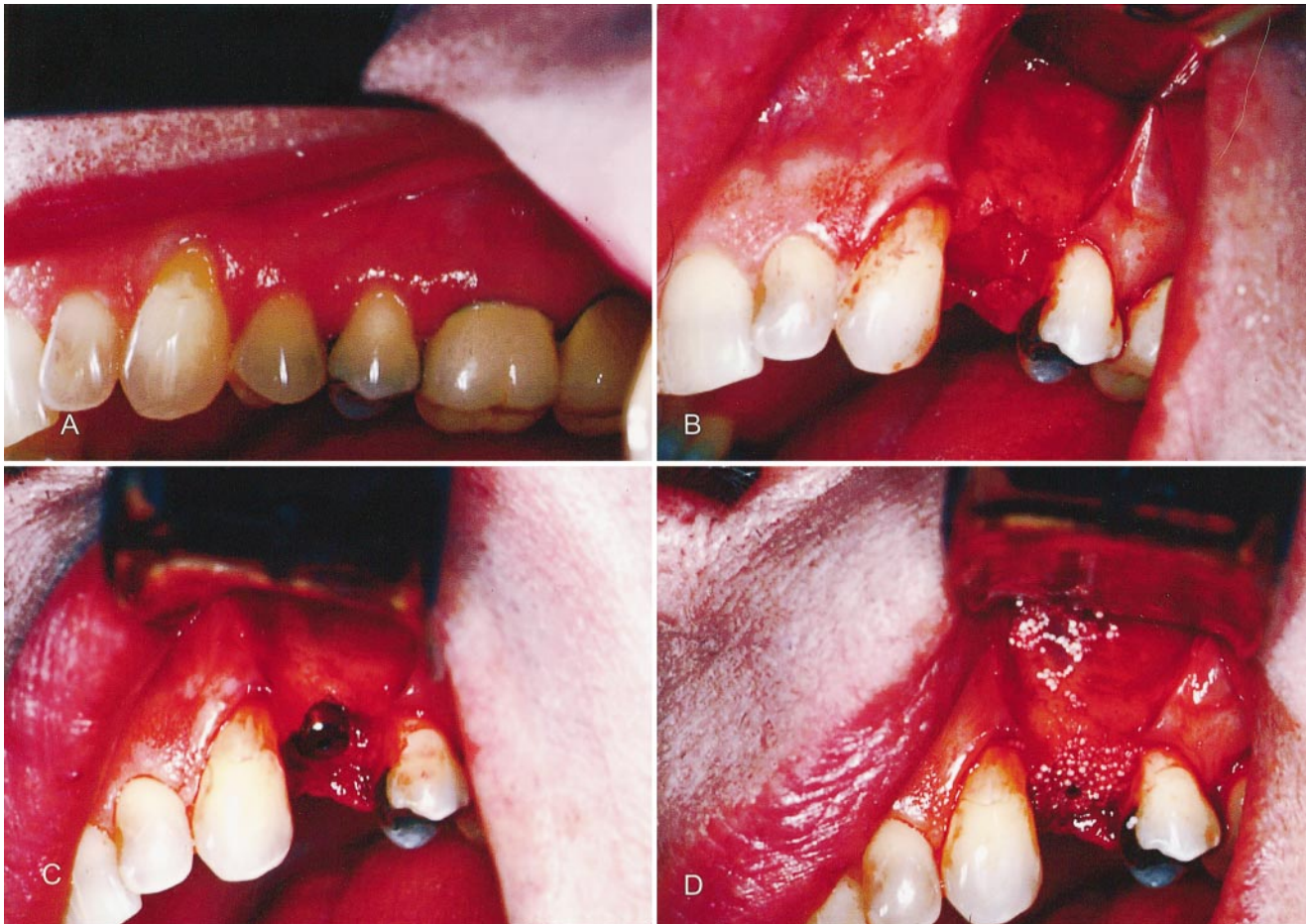


FIGURE 1. (A-D) Clinical series depicting preoperative appearance, extraction socket, implant placement, and HTR graft placement to fill socket voids, correct crestal irregularities, and add to facial width. Note apical fenestration also covered with HTR (more HTR added after photo taken because it was displaced by flap elevation).

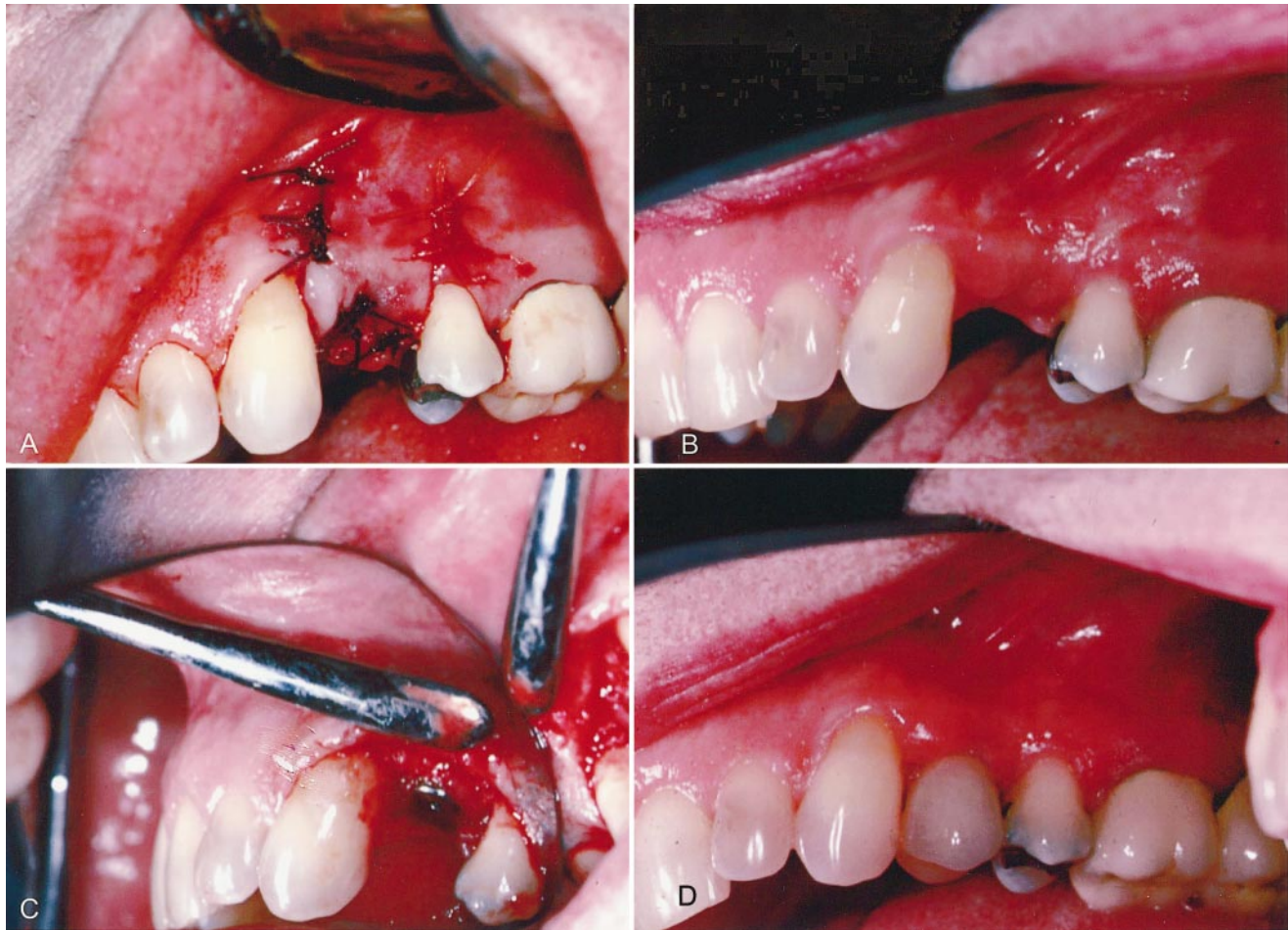


FIGURE 2. (A–D) Clinical series continues with closure of wound, 6-month clinical appearance, uncovering of implant showing increased bulk on facial, and single crown restoration after 6 months of function. The papillae reflect the general contour of the gingiva in that posterior segment.

was aggressively debrided of soft tissue. Flap elevation was used to gain access to an existing apical fenestration and to improve the prospects for primary soft tissue closure. Measurements were made with a periodontal probe of the internal facial-lingual socket width and the total ridge width. A 4.0 mm diameter \times 13 mm length hydroxylapatite-coated cylinder implant (Spline MP-1, Sulzer Dental, Carlsbad, Calif) was placed according to standard protocols. HTR 40 synthetic bone was hydrated with socket blood and was placed up to and coronal to the level of the existing socket bony walls and to the area of apical fenestration. Additional HTR was placed on the facial surface to increase the facial-lingual dimension. A colla-

gen-bandage (CollaTape, Sulzer Dental) was placed and the flaps coronally positioned with sutures to achieve primary closure. All of these materials are routinely used in our clinic. Standard postsurgical information and medications were given to the patient.

Ten days after implant placement, the patient was evaluated and sutures were removed. Further evaluations and hygiene visits were made at 1, 2, 6, 9, and 12 months postsurgically. At the 6-month appointment the implant was uncovered, measurements were again made with a periodontal probe of the internal facial-lingual socket width and the total ridge width, the healing abutment was connected, and the patient was referred to the restorative dentist. After 3 weeks of soft-tissue healing,

the prosthetic phase of treatment was begun.

RESULTS

The patient tolerated the procedure well and was pleased with the restorative result. There was no untoward inflammation, tissue necrosis, or other adverse events associated with the use of HTR. The implant is functioning well at 6 months after loading.

Table 1 demonstrates the measurements of the internal socket and total ridge widths at the time of extraction and implant placement and at the 6-month uncovering. The internal width of the socket was well preserved, and there was a slight increase in the total ridge width. The clinical case is presented in Figures 1–3.

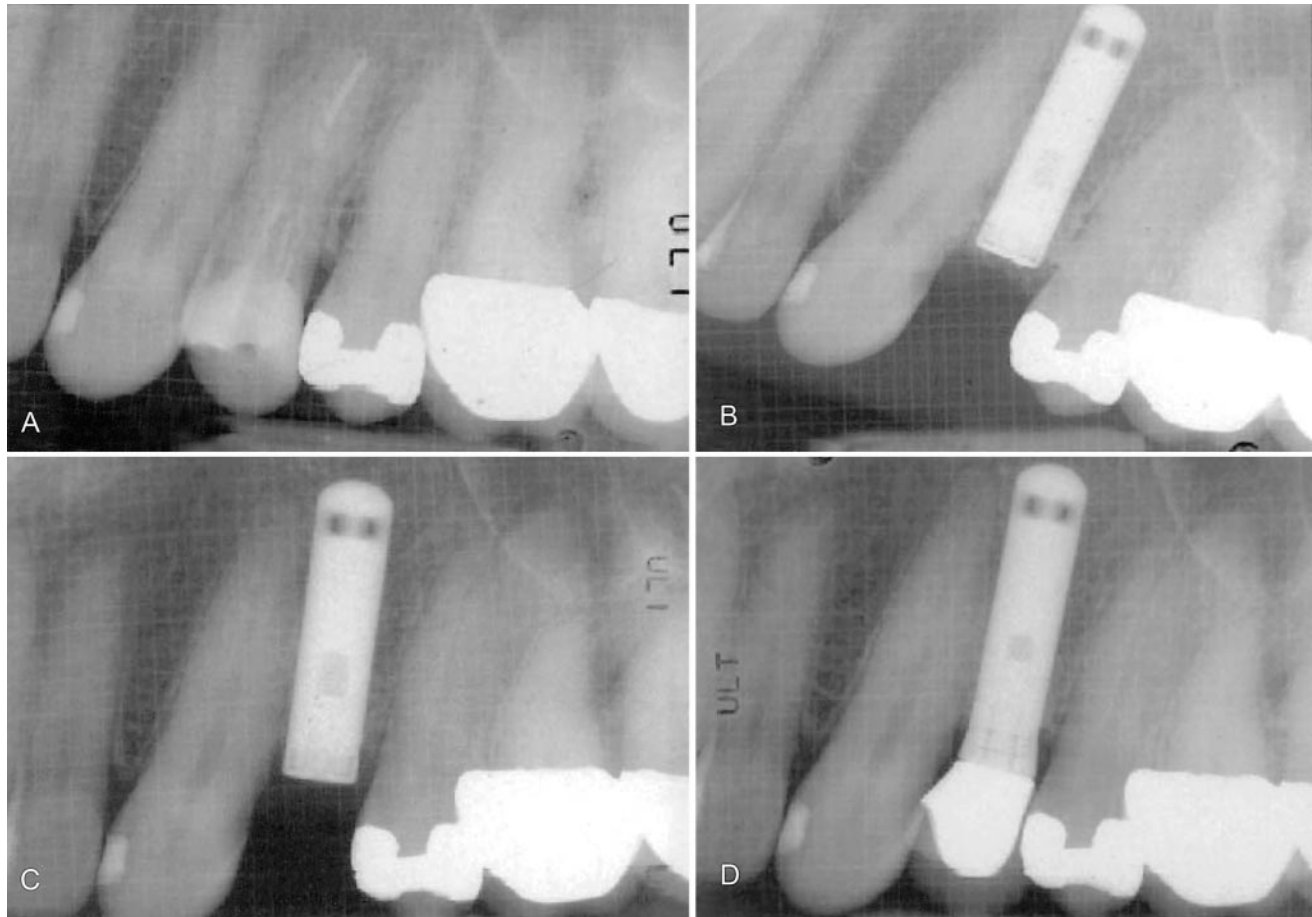


FIGURE 3. (A–D) Radiographic series showing initial condition of tooth 12, placement of implant and HTR graft, 6-month postoperative appearance, and crown in place after 6 months of loading. Slight gap apparent between crown and abutment, which was considered satisfactory by prosthodontist.

DISCUSSION

The use of the HTR graft material in conjunction with the placement of an immediate dental implant accomplished the treatment goal of preserving the ridge width and improving the restorability and aesthetics of the site. Immediate dental implant placement offers the patient a reduction in treatment time, and use of the HTR synthetic bone appears to preserve the ridge contour and width to improve restorability and aesthetics. The greater bone volume due to preservation of ridge width and height allowed for more ideal dental implant positioning, which had a direct effect on the ease of fabrication, aesthetic result, and biomechanics of the subsequent crown.

SUMMARY AND CONCLUSION

Socket augmentation with HTR synthetic bone appears to fulfill the purpose of a ridge preservation/augmentation material in conjunction with immediate placement of a hydroxylapatite-coated dental implant in a fresh extraction socket. This clinical case suggests that immediate dental implant placement in combination with HTR grafting is a predictable procedure. A good base for successful functional and aesthetic prosthetic reconstruction was obtained with this combined therapy.

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