

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-jds.com

Correspondence

Using open membrane technique with d-PTFE membrane during alveolar ridge preservation in defective socket reduces the need of guided bone regeneration



KEYWORDS

Alveolar ridge preservation;
Open membrane technique;
d-PTFE membrane

Although guided bone regeneration is considered a well-established technique to correct alveolar defects for dental implant treatment,¹ disadvantages are the increasing of treatment expenses, time, and risks of morbidity. Alveolar ridge preservation (ARP) performed immediately after tooth extraction may eliminate the need of extensive ridge augmentation procedures. It effectively reduces dimensional change of alveolar ridge after extraction.² Multiple approaches with abundant evidences have been proposed in performing ARP.³ Researches have proved that the non-resorbable high-density polytetrafluoroethylene (d-PTFE) membrane can be left exposed without compromising healing. When performing the open membrane technique in defective sockets, the mechanical stability of membrane is a key concern in order to secure the biomaterials in socket in early healing phases.

Here we present a patient who underwent ARP using open membrane technique, which facilitated implant placement without the need of guided bone regeneration (see Fig. 1). This 62-year-old patient came to our dental outpatient clinic stating he broke his upper right tooth on February 08, 2021. Clinical and radiographic exams revealed tooth 16 with crown-root fracture, and extraction was recommended. The patient was provided with several replacement options, and he decided to have an implant-supported restoration, thus

ARP was arranged on March 04, 2021. Tooth 16 was extracted with minimal trauma under local anesthesia, while a buccal plate dehiscence was noted, possibly due to vertical root fracture combining endodontic lesion. After careful debridement, the socket was filled with freeze-dried allogenic bone substitute and covered with a d-PTFE membrane. 5-0 Nylon crisscross and interrupted sutures were used to secure the membrane. Post operation instruction was given. The sutures were removed at one-week follow-up, and the d-PTFE membrane was retrieved at five-week follow-up. At six-month follow-up, the horizontal ridge dimensions and radiopacity in radiographs were considered adequate, and implant placement was carried out on November 06, 2021. Implant installation after drilling was uneventful, and healing abutment was placed due to good primary stability. The final crown was delivered on May 26, 2022 after a six-month healing without complications, and the patient was satisfied with the result.

Defective sockets with substantial dehiscence or fenestration after tooth extraction are common clinical scenarios. In these situations, where dimensional stability is essential, non-resorbable d-PTFE membranes may be more advantageous for its better mechanical stability and space maintenance over early healing period compared to resorbable membranes.^{4,5} If the defect isn't fully isolated

<https://doi.org/10.1016/j.jds.2022.07.005>

1991-7902/© 2022 Association for Dental Sciences of the Republic of China. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

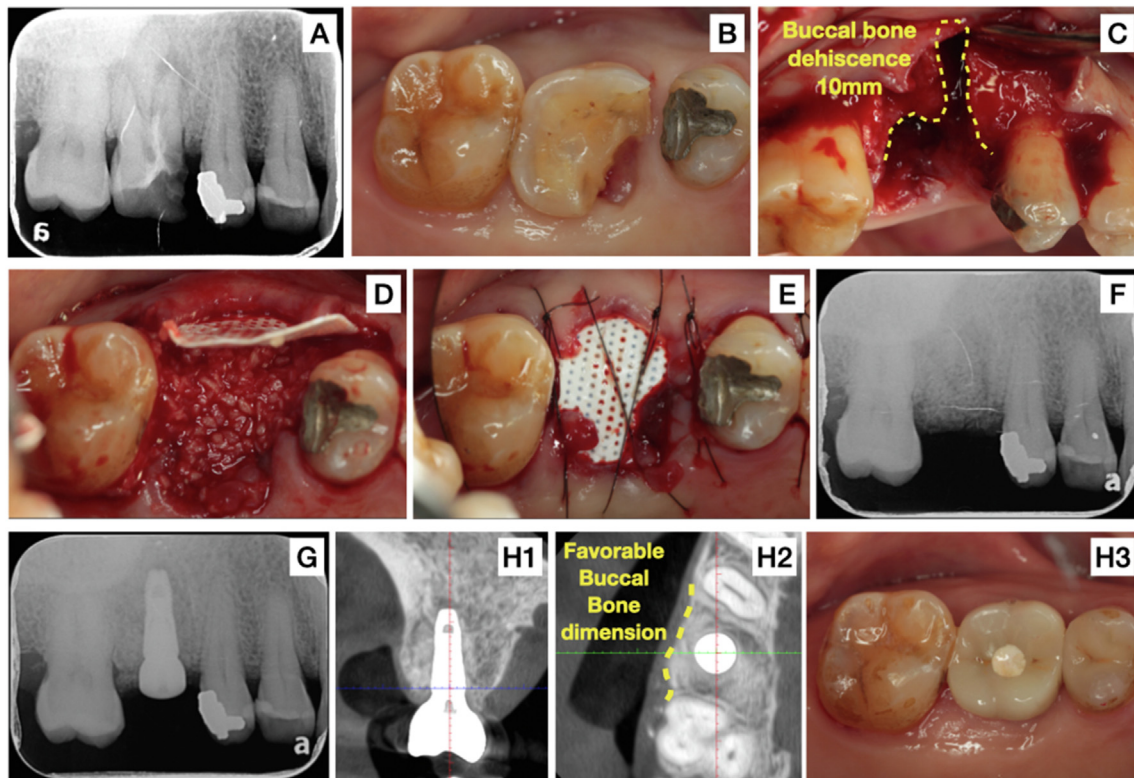


Figure 1 Clinical photographs and radiographs of this case: (A and B) Tooth 16 crown-root fracture with apical radiolucency. (C) After tooth 16 extraction and flap reflection, buccal dehiscence towards apex was noted. (D) Non-resorbable d-PTFE membrane (12 × 24mm Cytoplast™) and freeze-dried allogenic bone substitute (0.5 cc 0.5–1.0 mm Maxxeus) filling the extraction socket. (E) Wound sutured with 5–0 Nylon stitches. (crisscross and interrupted) (F) Radiograph taken immediately after extraction and alveolar ridge preservation. (G) Radiograph taken after implant placement at nine-month post-extraction without the need of additional bone augmentation. (H) Cone Beam Computed Tomography images and clinical photograph after final crown delivery, showing stable implant fixture with favorable buccal bone thickness.

by barrier membranes, soft tissue ingrowth often takes place and subsequently jeopardizes bone healing. Open membrane technique preserves keratinized mucosa and simplifies surgical procedure without having to obtain primary closure. In this case, d-PTFE membrane successfully maintained in place before removal for five weeks, containing graft material and preventing soft tissue ingrowth into extraction site. By utilizing open membrane approach, ARP with d-PTFE membrane and freeze-dried allogenic bone substitute in an upper molar socket with severe bone deficiency, bone dimensional change was reduced and the need for bone augmentation was eliminated for implant placement.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Huang YW, Tseng CW, Yu CH, Fang CY. The “wrap-guided bone regeneration (GBR)-technique” is a predicted and stable way for alveolar cleft repair and dental implant placement. *J Dent Sci* 2021;16:1328–30.

- Avila-Ortiz G, Chambrone L, Vignoletti F. Effect of alveolar ridge preservation interventions following tooth extraction: a systematic review and meta-analysis. *J Clin Periodontol* 2019;46:195–223.
- Zhao JH, Tsai CH, Chang YC. Clinical and histologic evaluations of healing in an extraction socket filled with platelet-rich fibrin. *J Dent Sci* 2011;6:116–22.
- Sun DJ, Lim HC, Lee DW. Alveolar ridge preservation using an open membrane approach for sockets with bone deficiency: a randomized controlled clinical trial. *Clin Implant Dent Relat Res* 2019;21:175–82.
- Walker CJ, Prihoda TJ, Mealey BL, Lasho DJ, Noujeim M, Huynh-Ba G. Evaluation of healing at molar extraction sites with and without ridge preservation: a randomized controlled clinical trial. *J Periodontol* 2017;88:241–9.

Yun-Chieh Tsai[†], Yi-June Lo[†]

Division of Periodontics, Department of Dentistry, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan

Chih-Yuan Fang**

Division of Oral and Maxillofacial Surgery, Department of Dentistry, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan
School of Dentistry, College of Oral Medicine, Taipei Medical University, Taipei, Taiwan

[†] These two authors contributed equally to this work.

Yen-Wen Huang*

Division of Periodontics, Department of Dentistry, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan

**Corresponding author. Division of Oral and Maxillofacial Surgery, Department of Dentistry, WanFang Hospital, Taipei Medical University, No. 111, Sec. 3, Xinglong Rd., Wenshan Dist., Taipei, 116081, Taiwan.
E-mail address: ndmcd52@gmail.com (C.-Y. Fang)

*Corresponding author. Division of Periodontics, Department of Dentistry, WanFang Hospital, Taipei Medical University, No. 111, Sec. 3, Xinglong Rd., Wenshan Dist., Taipei, 116081, Taiwan.
E-mail address: marr529@yahoo.com.tw (Y.-W. Huang)

Received 12 June 2022

Final revision received 7 July 2022

Available online 31 July 2022