

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.e-jds.com](http://www.e-jds.com)

## Correspondence

# Effects of platelet-rich fibrin on healing of an extraction socket with buccal cortical plate dehiscence



The immediate repair of bony defect after infected tooth extraction is subject to considerable debate. The goal is to achieve the optimal residual ridge width resulting in better bone dimension as well as esthetics for later implant placement. As a horizontal bony defect, guided bone regeneration (GBR) is predictable and successful with either non-resorbable or resorbable membranes. However, the most common clinical complication in GBR is an early membrane exposure which may compromise the final results. The technique of platelet-rich fibrin (PRF), developed by Choukroun et al.,<sup>1</sup> requires neither anticoagulant nor any other gelling agent such as bovine thrombin. This fibrin network can enhance cell growth, migration, and proliferation.<sup>2</sup> In this case report, PRF was applied to the buccal cortical plate dehiscence for further ideal implant placement after extraction of the infected tooth 21 with external root resorption.

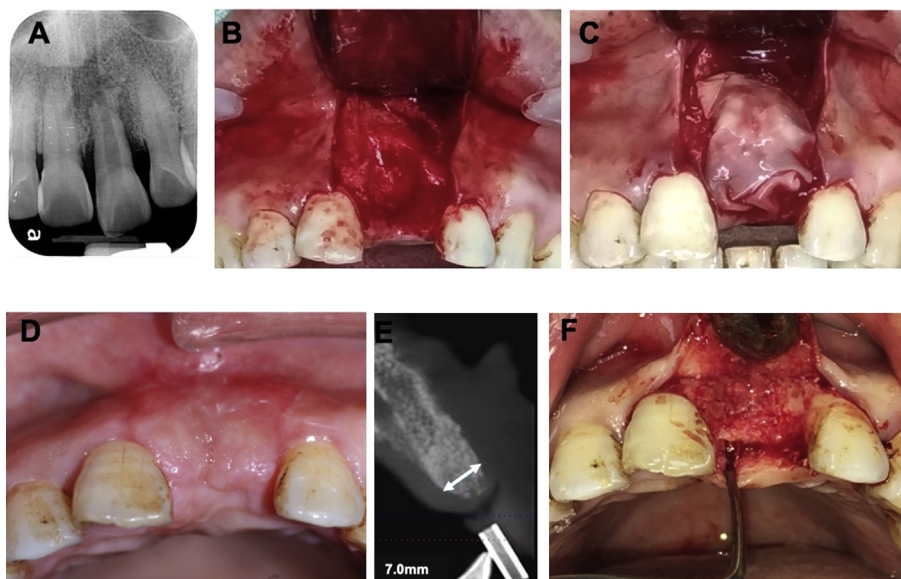
A systemically healthy 58-year-old man with the chief complaint of severe mobility of tooth 21 wanted to remove the mobile tooth and then restore the edentulous area with an implant. He mentioned a history of trauma around the premaxilla about 10 years ago. Tooth elongation and persistent pus discharge from the gingival sulci were noted. A periapical radiograph revealed external root resorption and radiolucency with irregular margin around apex (Fig. 1A). The probing depth was exceeding 10 mm over buccal area with pus discharge and bleeding, tooth 21 removal with the GBR procedure was planned. Under local anesthesia, the full-thickness mucoperiosteal flap with two vertical releasing incisions was elevated. Tooth extraction was performed followed by thorough debridement of the

infected tissues within the socket (Fig. 1B). Total buccal cortical plate dehiscence was noted. The corticocancellous grafts (Maxxeus® Dental, Kettering, OH, USA) chopped with PRF membranes were filled in the socket and then the outer surface was covered with PRF membrane (Fig. 1C). Tension-free closure was achieved by using 5-0 nylon. After two weeks, the patient was reappointed for wound inspection and suture removal. The wound healing was uneventful (Fig. 1D). After 3 months, the image of cone beam computed tomography revealed the alveolar ridge preservation with 7.0 mm width in horizontal dimension (Fig. 1E). The dense bone-like tissue bone was demonstrated and the more than 35 Ncm insertion torque noted during implant placement (Fig. 1F).

Our previous studies have shown that the extraction socket filled with PRF as a sole grafting material could preserve the alveolar ridge.<sup>3,4</sup> In this case, marked resorption of the alveolar ridge at both horizontal and vertical directions was shown after tooth extraction. The use of PRF could offer several advantages like promoting soft and hard tissue wound healing due to fibrin bandage and growth factors release such as platelet derived growth factor and transforming growth factor.<sup>1</sup> Addition with bone graft materials would be suggested to enhance the effects of PRF for space making in the large bony defect area such as radicular cyst enucleation.<sup>5</sup> This could reduce alveolar ridge resorption following tooth extraction and positively influence socket healing over a 3-month period. Taken together, this technique may potentially preserve the alveolar ridge dimension after tooth extraction with buccal cortical plate dehiscence.

<https://doi.org/10.1016/j.jds.2018.10.003>

1991-7902/© 2019 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** (A) Initial periapical x-ray showed external root resorption with periapical radiolucency around the root apex of tooth 21. (B) Clinical photograph demonstrated the totally buccal cortical plate dehiscence of tooth 21. (C) The bony defect was augmented with bone graft and platelet-rich fibrin membrane was used to cover the bone graft. (D) Clinical photograph 3 weeks after treatment. (E) After 3 months, the double-end arrow indicated that the horizontal width reached 7.0mm on a cone beam computed tomography image. (F) Clinical photograph of re-entry for implantation after 3 months.

### Conflicts of interest

The authors report no conflicts of interest related to this study.

### References

1. Choukroun J, Adda F, Schoeffler C, Vervelle A. PRF: an opportunity in perio-implantology (in French). *Implantodontie* 2000; 42:55–62.
2. Tsai CH, Shen SY, Zhao JH, Chang YC. Platelet-rich fibrin modulates cell proliferation of human periodontally related cells *in vitro*. *J Dent Sci* 2009;4:130–5.
3. 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.
4. Zhao JH, Chang YC. The alveolar ridge preservation following tooth extraction using platelet-rich fibrin as the sole grafting material. *J Dent Sci* 2016;11:345–7.

5. Zhao JH, Tsai CH, Chang YC. Management of radicular cysts using platelet-rich fibrin and bioactive glass: a report of two cases. *J Formos Med Assoc* 2014;113:470–6.

Yi-Tzu Chen

Yu-Wei Chiu

Yu-Chao Chang\*

School of Dentistry, Chung Shan Medical University,  
Taichung, Taiwan

Department of Dentistry, Chung Shan Medical University  
Hospital, Taichung, Taiwan

\*Corresponding author. School of Dentistry, Chung Shan  
Medical University, 110, Sec. 1, Chien-Kuo N. Rd., Taichung,  
Taiwan. Fax: +886 4 24759065.

E-mail address: [cyc@csmu.edu.tw](mailto:cyc@csmu.edu.tw) (Y.-C. Chang)

Received 28 October 2018

Final revision received 30 October 2018

Available online 17 November 2018