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## CORRESPONDENCE

# Schneiderian membrane repair with platelet-rich fibrin during maxillary sinus augmentation with simultaneous implant placement



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Maxillary sinus augmentation is used to gain adequate bone volume for the placement of dental implants in edentulous posterior maxilla. Schneiderian membrane perforation is one of the most common complications associated with maxillary sinus augmentation procedures. Choukroun's platelet-rich fibrin (PRF) protocol is a simple and free technique that allows one to obtain fibrin clots and membranes enriched with platelets and growth factors, after starting from an anticoagulant-free blood harvest.<sup>1</sup> The clinical applications of PRF have already been described in periodontal regeneration surgery,<sup>2</sup> sinus augmentation,<sup>3</sup> and bisphosphonate-related osteonecrosis of the jaw.<sup>4</sup> This report is the first to provide a quick and simplified option for the repair of Schneiderian membrane perforation with PRF during maxillary sinus augmentation with simultaneous implant placement.

A 62-year-old man, who has had diabetes mellitus for 10 years, had atrophy of the left maxillary posterior

edentulous area that required a sinus lift before implantation. A preoperative panoramic radiograph exhibited bilateral maxillary bone atrophy with a residual crest height of <4 mm (Figure 1A). PRF clots and membranes were prepared as described previously.<sup>1</sup> During surgery, whole blood samples were taken from this patient and placed into glass-coated plastic tubes and immediately centrifuged at 400 g for 12 minutes. Sinus augmentation followed the lateral wall protocol with local anesthesia. In brief, after a buccal mucoperiosteal flap was raised, an osteotomy was prepared in the lateral wall of the sinus. Schneiderian membrane perforation was noted during hand manual instrumentation of the membrane (Figure 1B), then PRF clots and membranes were placed directly onto the membrane (Figure 1C). After repair of the sinus membrane perforation, sinus augmentation was continued with simultaneous placement of Dynamix implants (Cortex, Shlomi, Israel) and synthetic bone graft, then the lateral access window was covered with PRF membrane as a barrier (Figures 1D and 1E). The healing processes under regular clinical examination were uneventful. After a healing period of 12 months, the implant was exposed for crown fabrication. The patient was regularly followed up, and intraoral pictures revealed healthy gingival architecture and no gingival recession observed after 2.5 years. Form cone beam computer tomography (panoramic view) evaluation, compared with

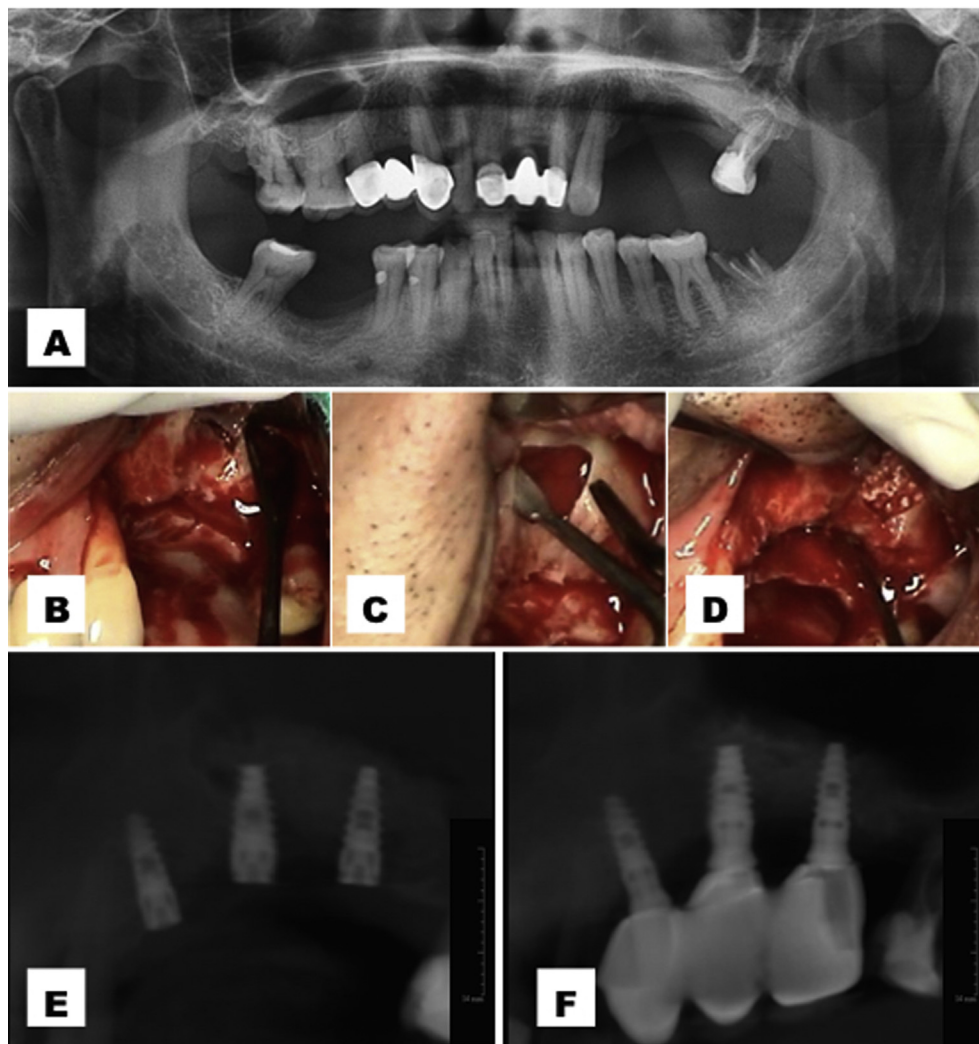
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**Figure 1** (A) Initial panoramic radiograph exhibited bilateral maxillary bone atrophy with a residual crest height of <4 mm. (B) Clinical photograph for right lateral wall osteotomy, perforation occurred when elevating the sinus membrane. (C) Perforation was covered with PRF clots and membranes. (D) Sinus cavity partially packed with synthetic bone graft, finally PRF membrane was applied to cover the bony window. (E) Panoramic view of cone beam computer tomography (CBCT) after implant placement. (F) Panoramic view of CBCT after prosthetic rehabilitation at 30 months of follow up. PRF = platelet-rich fibrin.

initial implant placement, demonstrated that the peri-implant bone was stable and the grafted bone material was more compact (Figure 1F). The patient did not have any other symptoms and was satisfied with the implant restorations.

Choukroun's PRF preparation creates a fibrin network very similar to the natural one with incorporation of the platelets in the fibrin meshes.<sup>1</sup> This nature of PRF makes it easy to place into tight maxillary sinuses, and the self-adherent property eliminates the need for suturing. In addition, PRF can stimulate proliferation of osteoblasts, gingival fibroblasts, and periodontal ligament cells but suppress oral epithelial cell growth.<sup>5</sup> The cell type-specific actions of PRF may be beneficial for tissue regeneration. The findings of this case report suggest that PRF may be a viable consideration for the repair of perforated Schneiderian membrane.

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