

The Socket-Shield Technique in the Anterior Maxilla: A Case Presentation

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Introduction

Maxillary anterior implant placement has always posed a challenge given the anatomy of the anterior maxilla and the resorptive pattern of the buccal bone after tooth extraction. The socket-shield (SS) technique can minimize buccal bone resorption as described by Hurzeler's proof-of-principle report in 2010. The SS functions by retaining the buccal portion of a root and an implant can be placed lingual to this fragment. In this case report, the SS technique was utilized with immediate implant placement along with immediate provisionalization using the patient's own tooth.



Figure 1. Pre-op Photo, Facial View



Figure 2. Pre-op Photo, Occlusal View

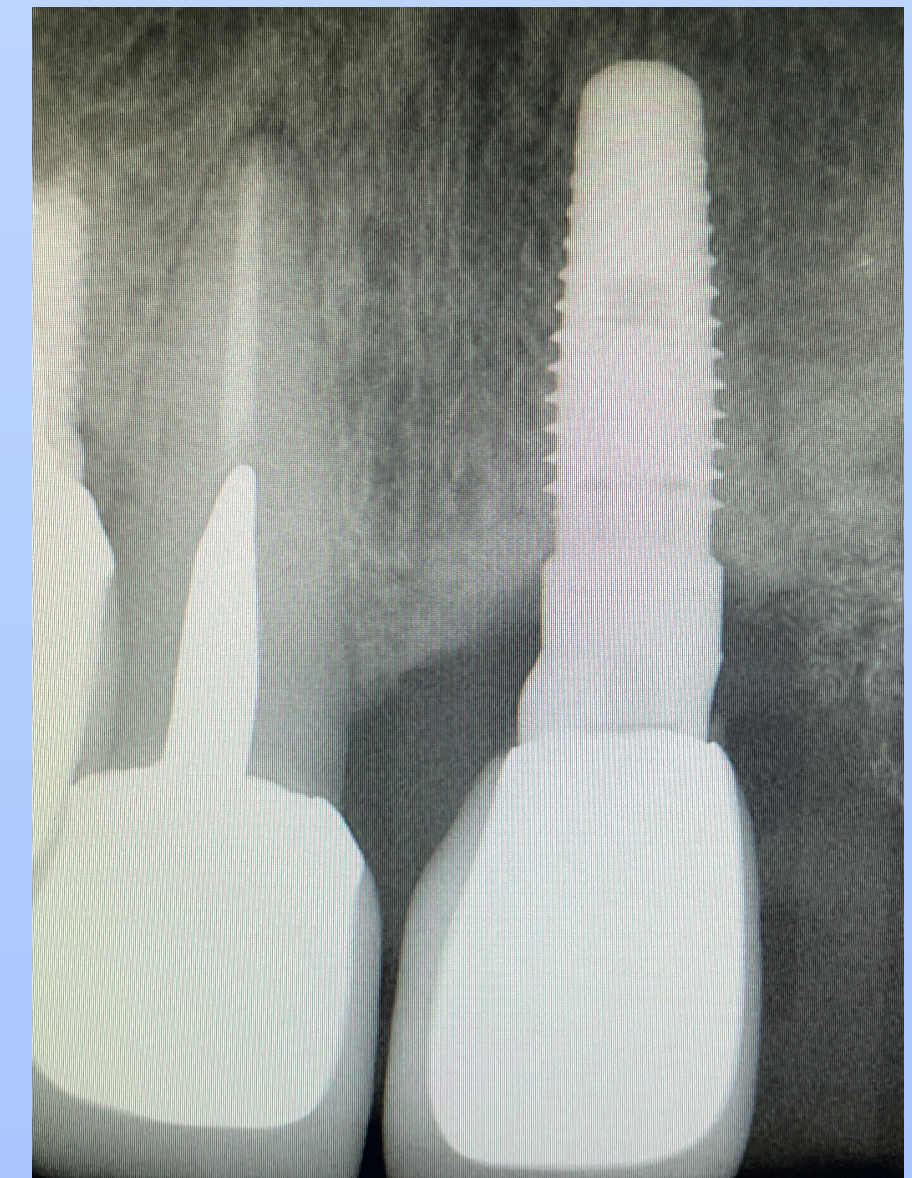


Figure 3. Pre-op Radiograph

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Methods

On June 9th of 2023, a 69 y/o female presented for extraction and immediate implant placement in site #8 after her tooth fractured at the gingival margin. After sectioning the root mesio-distally, the lingual fragment was removed and the buccal portion of the root was reshaped and left as the SS. A buccal fenestration apical to the SS was visualized and a semi-lunar incision was created to repair the defect. A 4.2x15mm implant was placed and 50/50 corticocancellous FDBA was placed over the fenestration. A collagen membrane was placed over the bone graft material and tucked under the periosteum. The semilunar incision was then sutured primarily with 4.0 single interrupted chromic gut sutures. The patient's PFM crown was then hollowed out and an engaging titanium cylinder was picked up intra-orally using flowable composite. The provisional restoration was then finished extra-orally. Finally the provisional restoration was inserted and hand tightened onto the implant and the occlusion was adjusted.

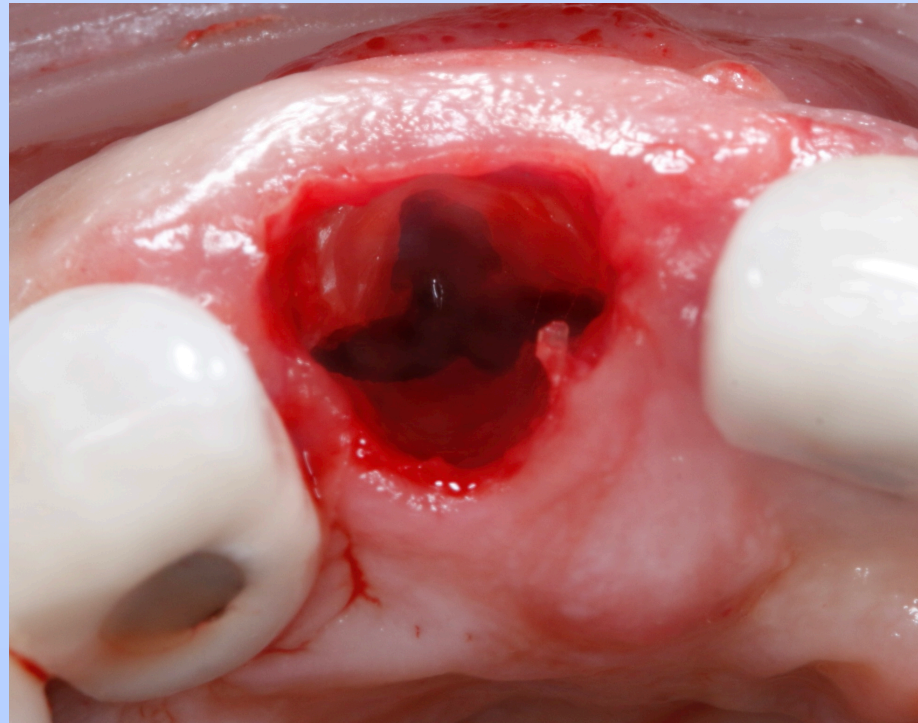


Figure 4. Preparation of Socket Shield



Figure 5. Buccal Fenestration

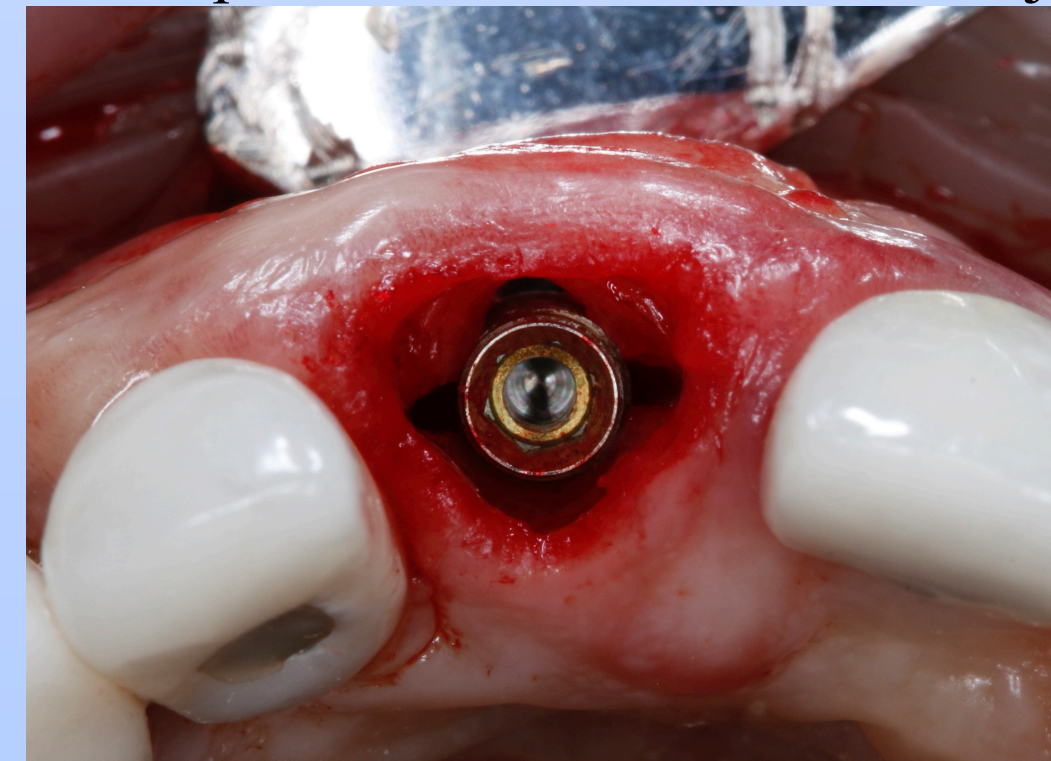


Figure 6. Implant Placement

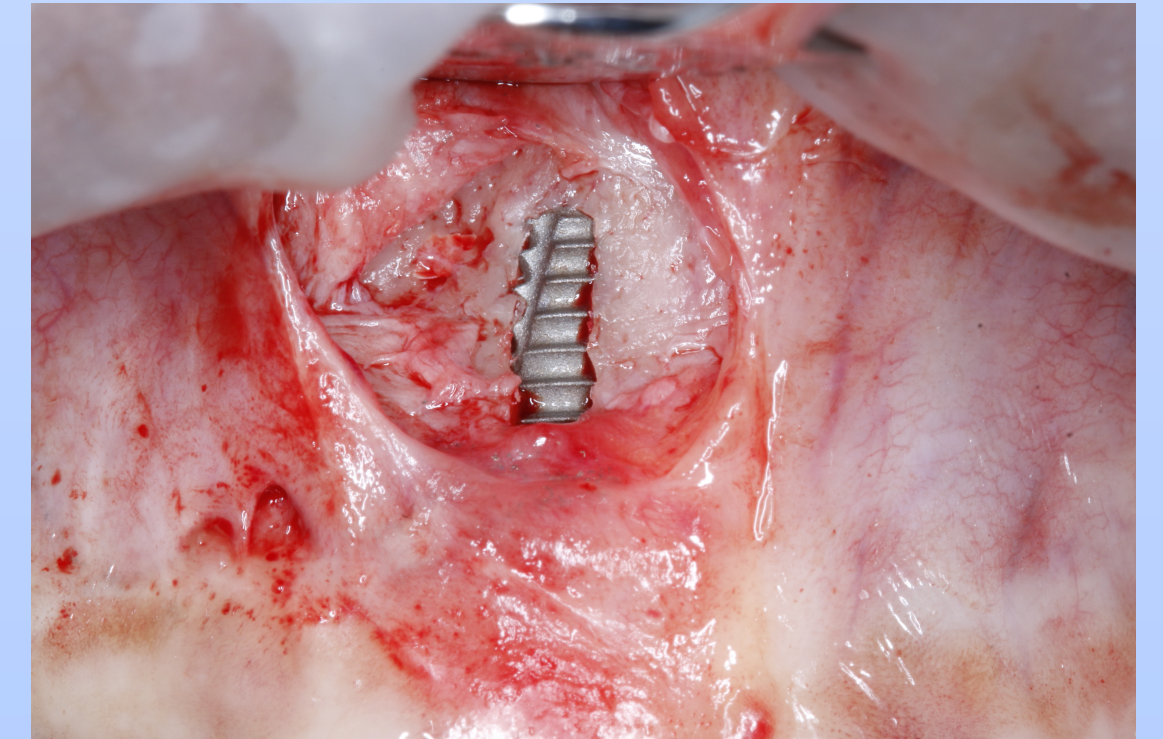


Figure 7. Implant exposure through fenestration



Figure 8. Grafting of Fenestration

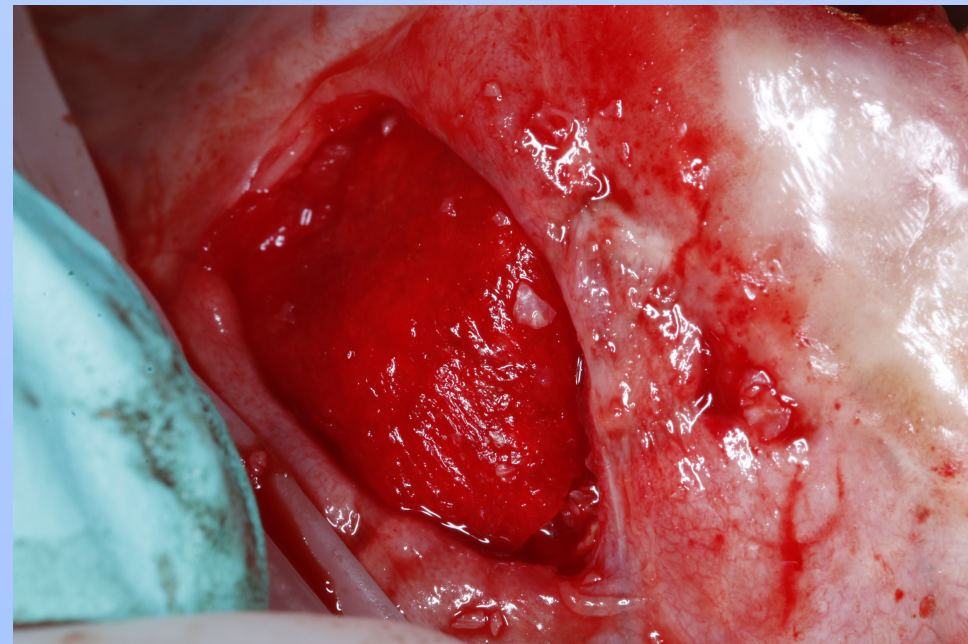


Figure 9. Collagen Membrane



Figure 10. Fractured PFM Crown

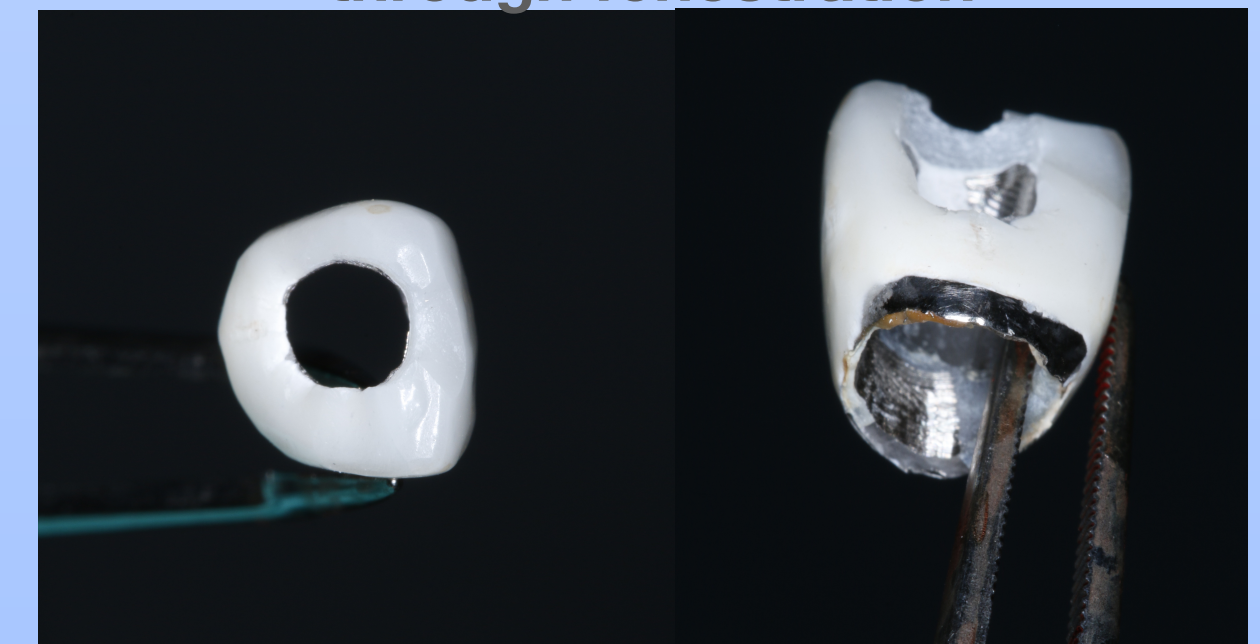


Figure 11. Access hole made in PFM crown

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Methods (continued)

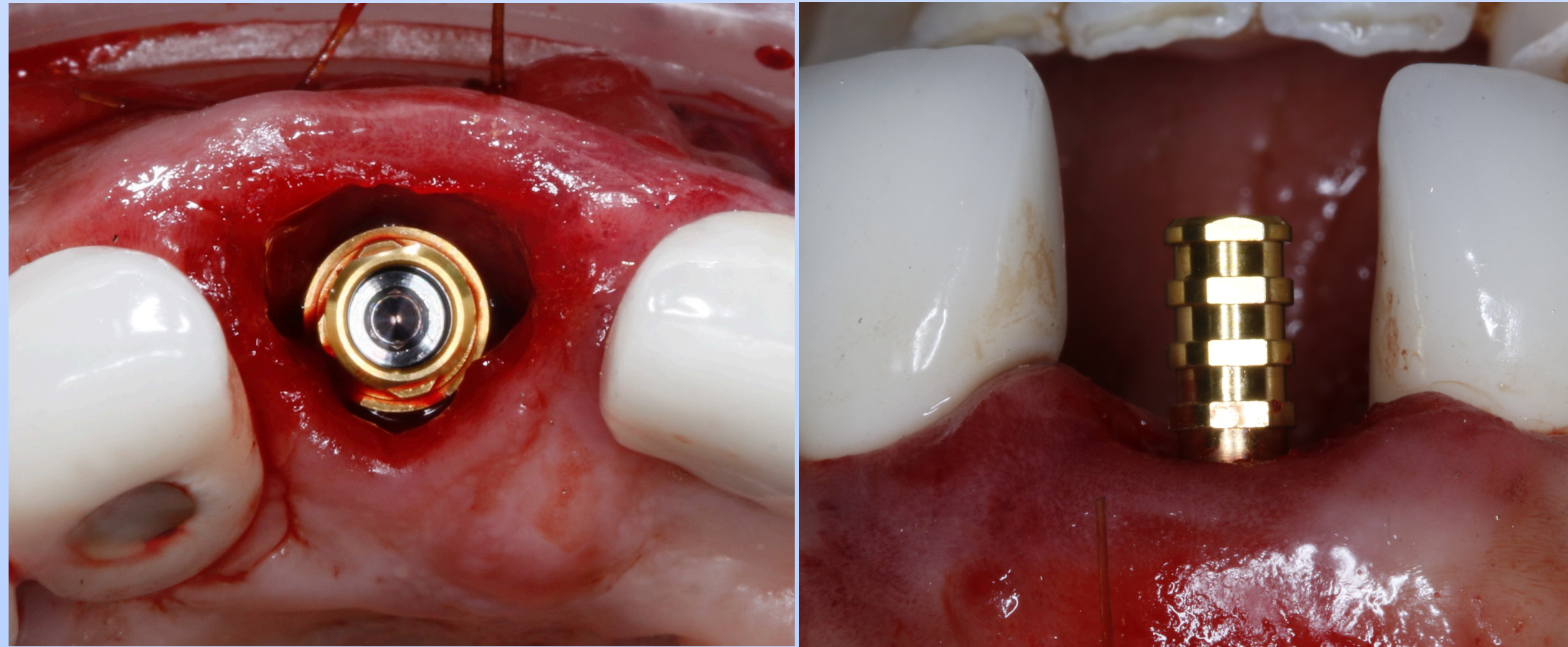


Figure 12. Temporary Cylinder

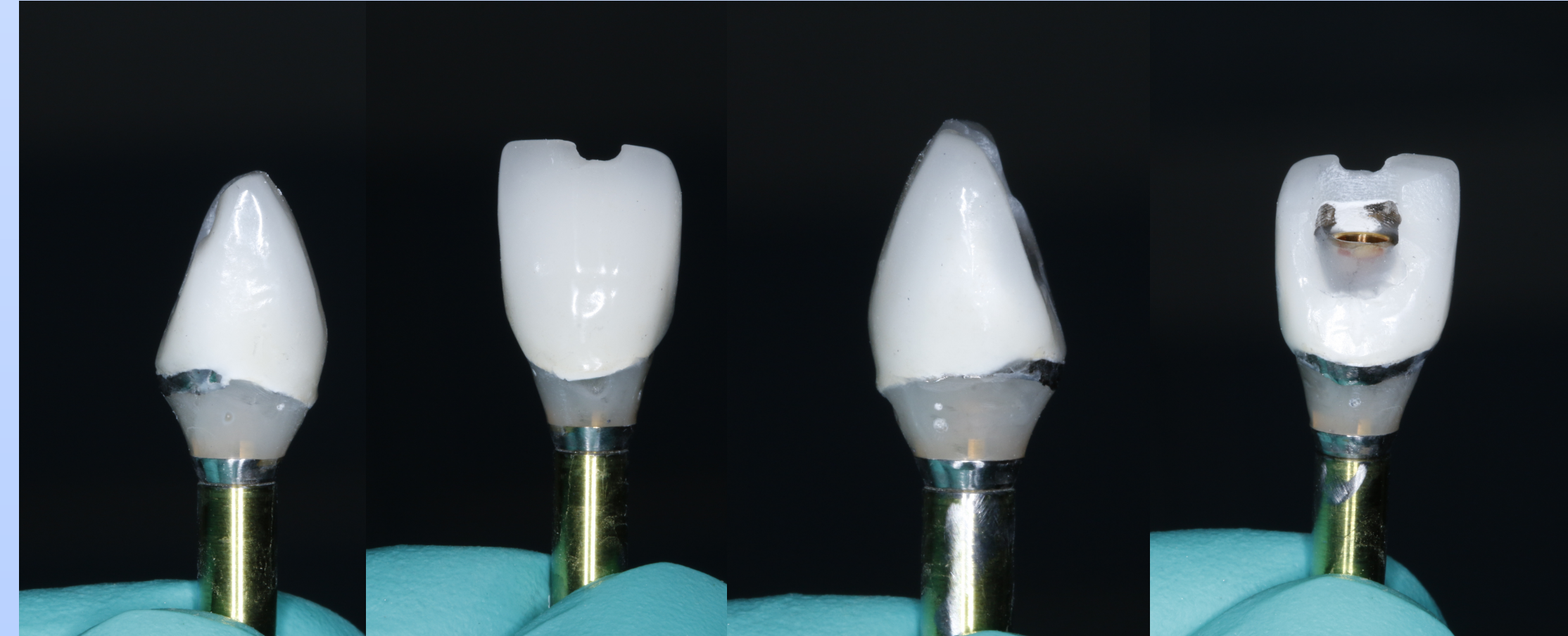


Figure 13. Provisional Restoration



Figure 14. Immediate Post-op



Figure 15. Centric Occlusion

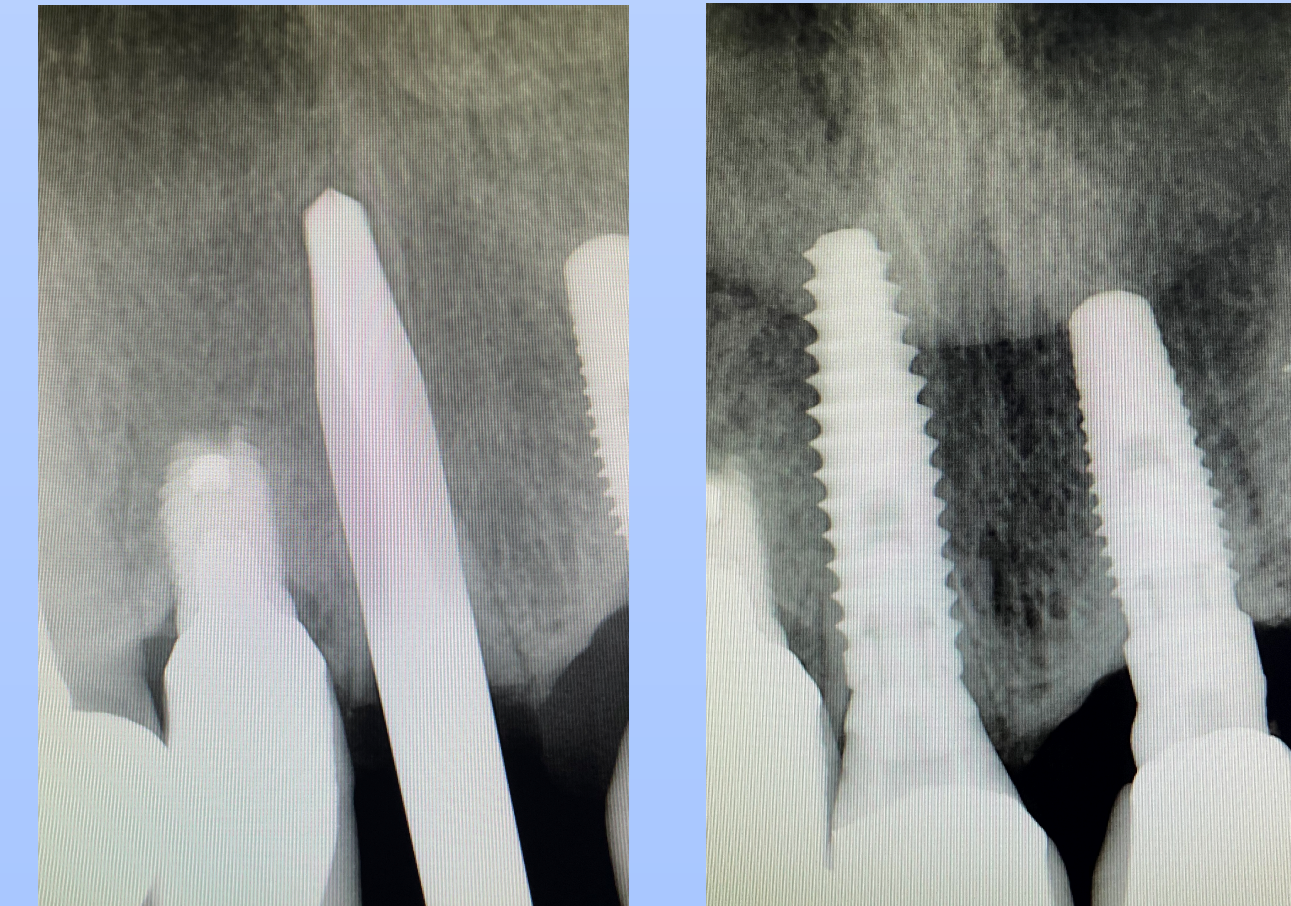


Figure 16. Intra and Post-op Radiograph

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Results

After 3 months of healing the patient returned for a follow up and gingival erythema and heme could be visualized mid-facial to the provisional restoration at the gingival margin. The provisional restoration was removed and an internal exposure of the SS was visualized. The SS was trimmed 1-2mm apically and the provisional restoration was re-inserted and torqued to 30 ncm.

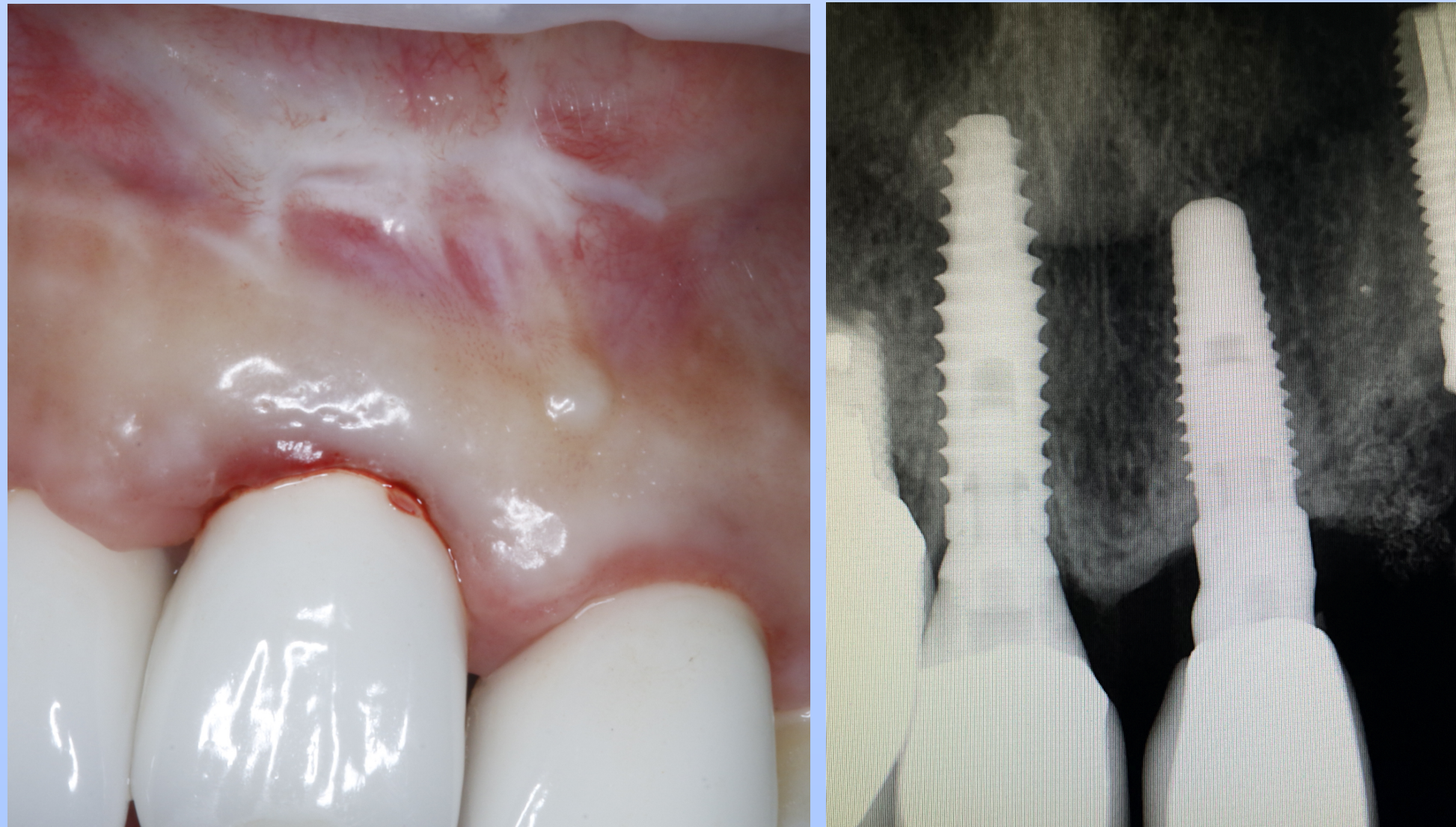


Figure 17. 3 months Post-op Facial View and Radiograph

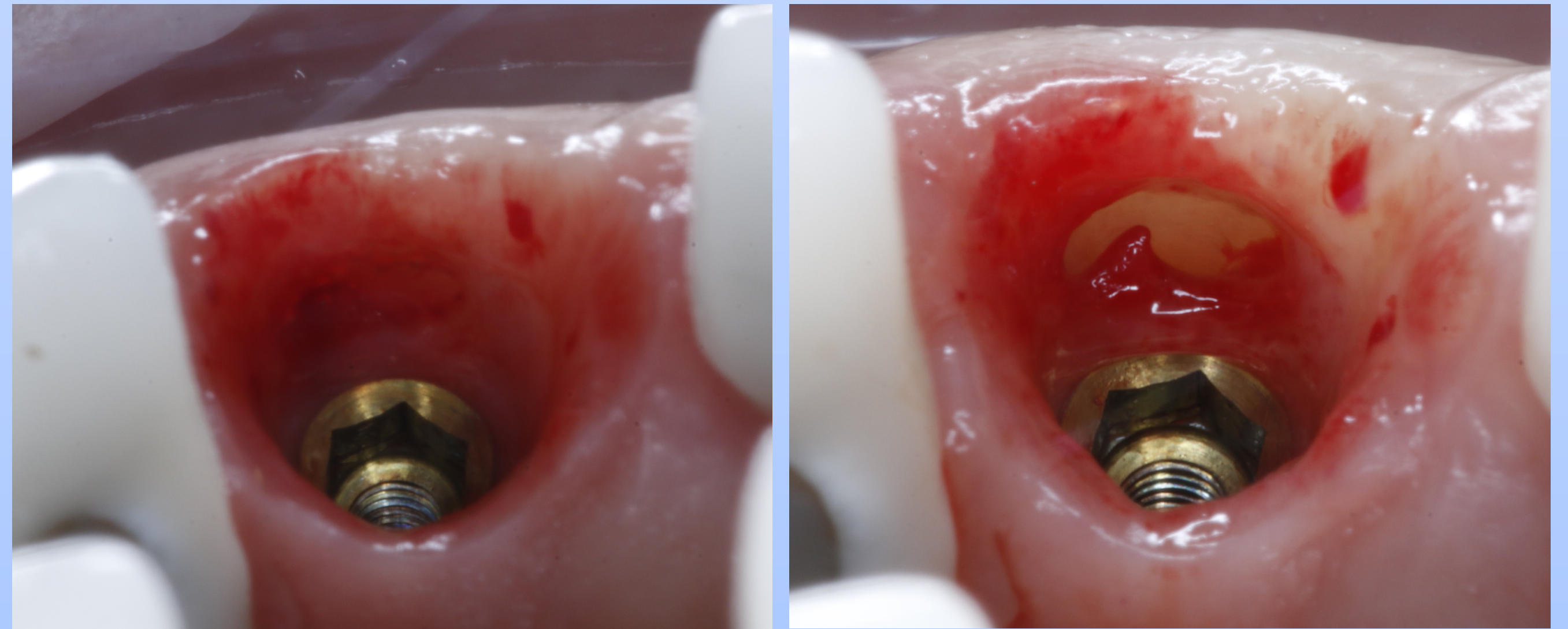


Figure 18. 3 months Post-op: Internal Exposure

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Results (continued)

After 1 month of healing from this corrective procedure the patient returned for a follow up and showed signs of uneventful healing. A CBCT scan was taken to evaluate the implant and revealed bone fill circumferentially around the implant, a stable SS, and the regeneration of the buccal plate where the fenestration existed at the time of surgery.

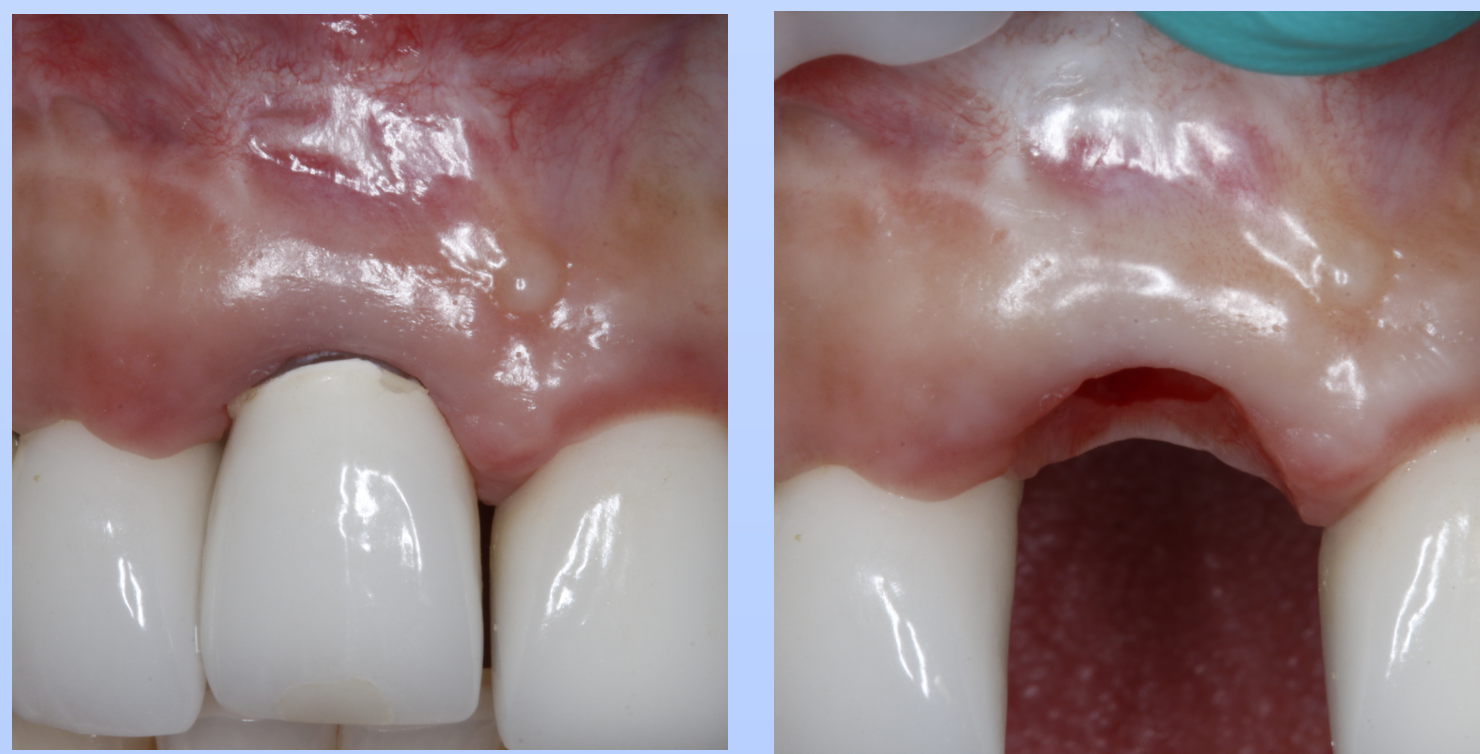


Figure 19. 4 months Post-op (1 month post corrective surgery)

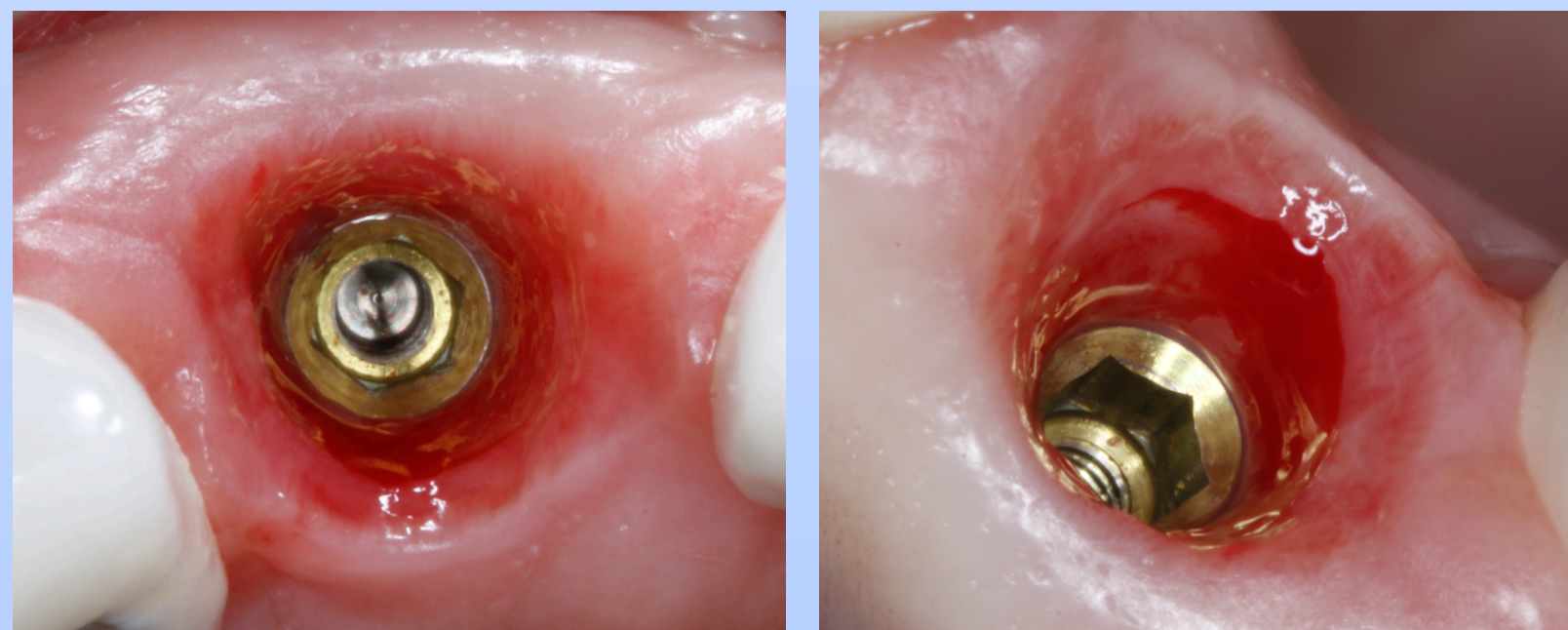


Figure 20. 4 months Post-op (1 month post corrective surgery)

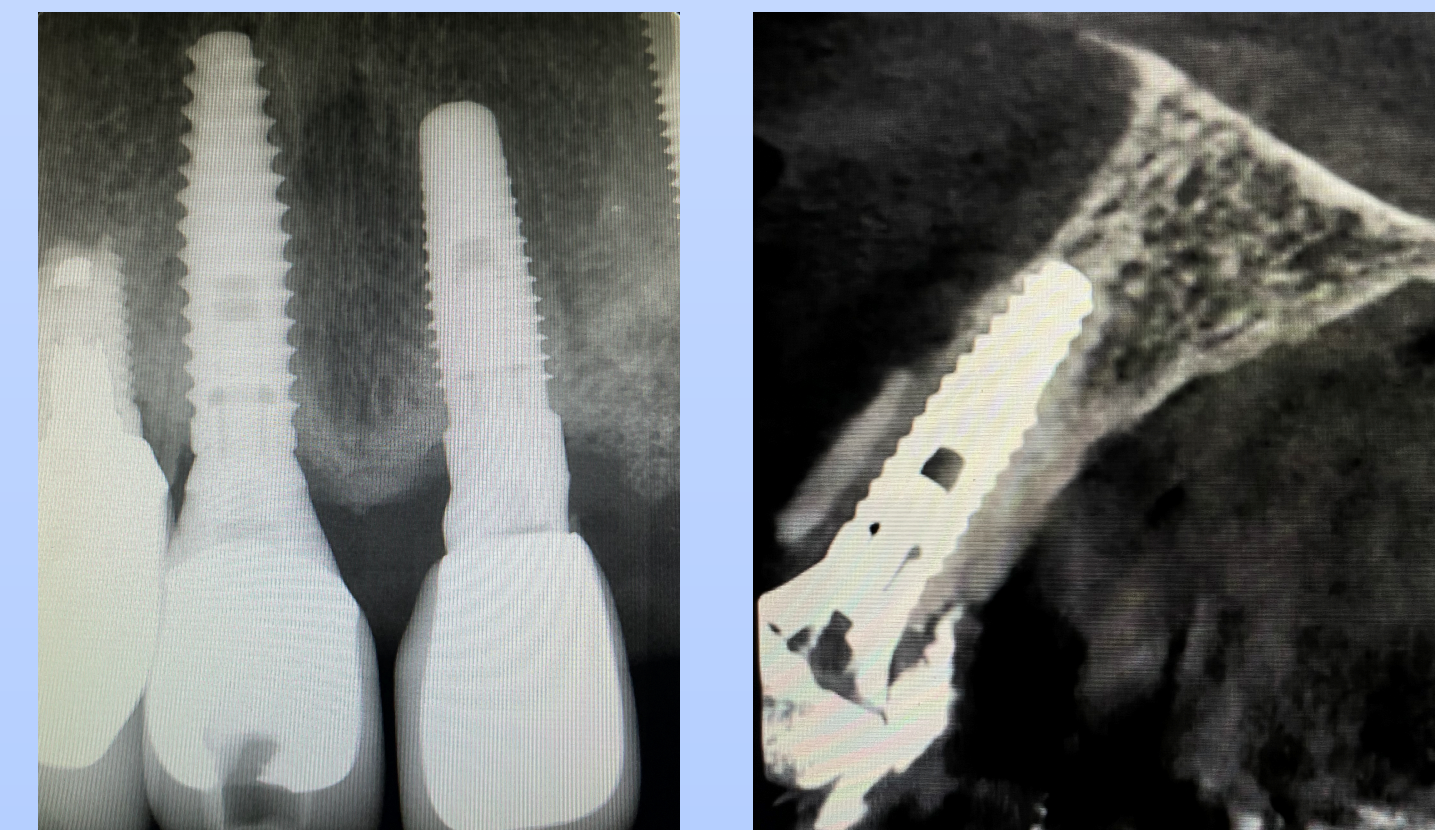


Figure 21. 4 months Post-op: PA and CBCT

Conclusions

The SS technique is a procedure that can prevent the resorption of the buccal plate but can have complications that need to be managed appropriately. Inter-implant papilla and bone height can be challenging to maintain; however, the SS technique may serve as a viable treatment option in such cases.

References

1. Hürzeler MB, Zuhr O, Schupbach P, Rebele SF, Emmanouilidis N, Fickl S. The socket-shield technique: a proof-of-principle report. J Clin Periodontol. 2010 Sep;37(9):855-62. doi: 10.1111/j.1600-051X.2010.01595.x. PMID: 20712701.
2. Gluckman H, Salama M, Du Toit J. A retrospective evaluation of 128 socket-shield cases in the esthetic zone and posterior sites: Partial extraction therapy with up to 4 years follow-up. Clin Implant Dent Relat Res. 2018;20:122-129.
3. Chen JT, Kan JYK, Rungcharassaeng K, Roe P, Liao HC, Limmeechokchai S, Lozada J. Inter-implant Papilla Changes Following Anterior Immediate Tooth Replacement with Socket Shields: A 1- to 10-Year Retrospective Study. Int J Periodontics Restorative Dent. 2023 Jul-Aug;43(4):451-460. doi: 10.11607/prd.6161. PMID: 37552192.