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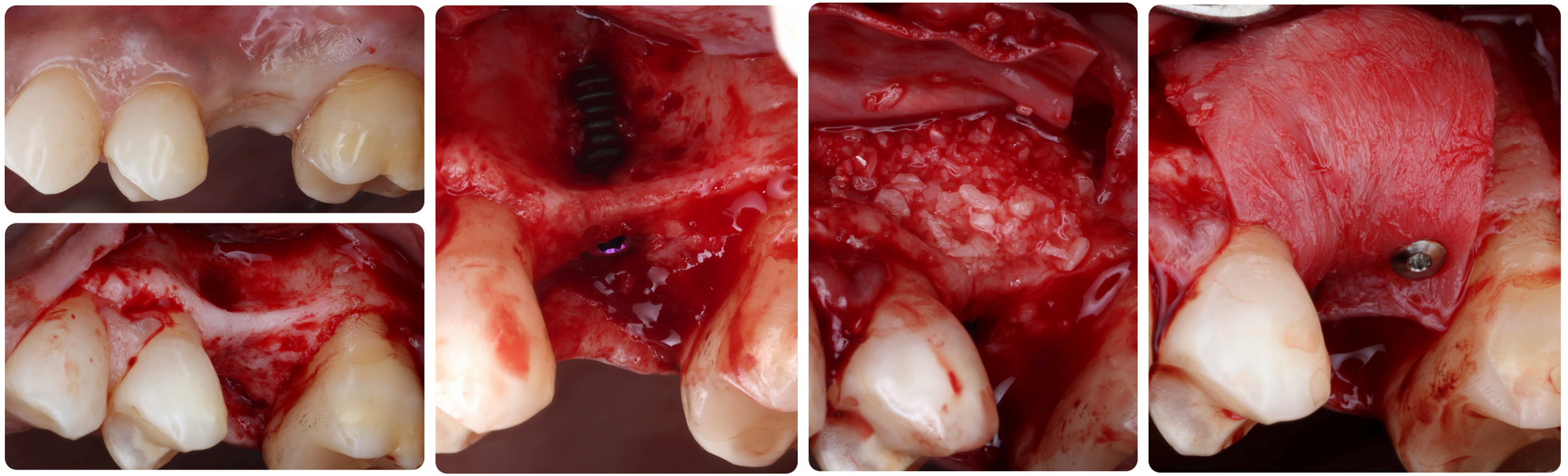

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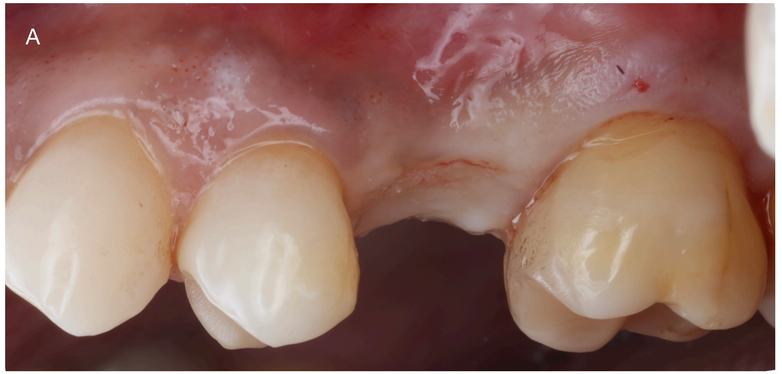
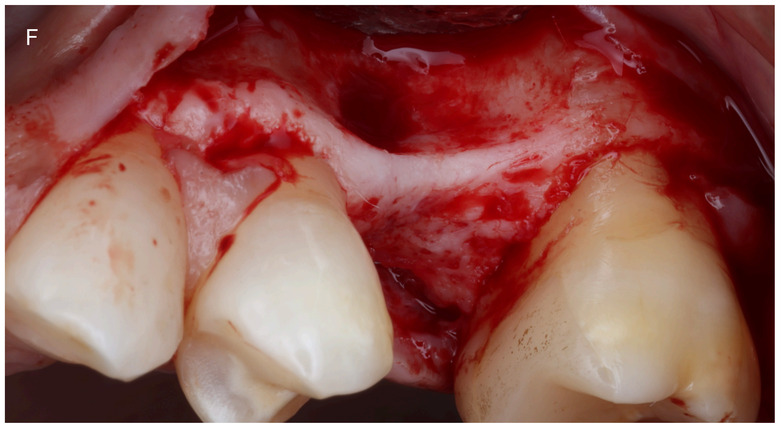
Background

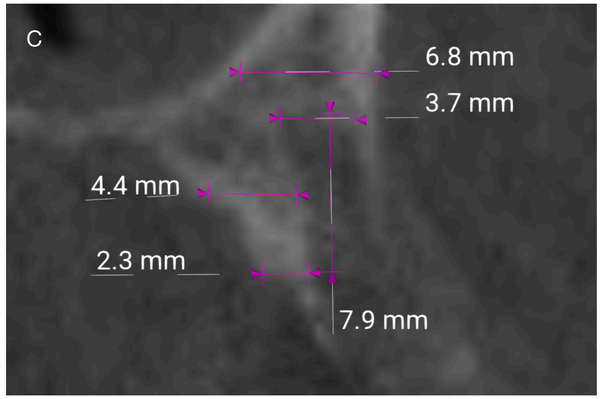
Lack of osseointegration and early implant loss, loss within 3 weeks in this case, may be due to surgical trauma, resulting in pressure necrosis or overheating[1], occlusal load, infection, or other risk factors. Identifying these factors and a solution allows for treatment adjustments. A systematic review by Dr. Thoma[2] supports lateral bone augmentation with simultaneous implant placement; clinical scenarios reviewed showed fenestration defects, implant placement, and resolution of the defects through GBR, noting greater defect resolution with the resorbable membranes. Stabilizing options include the Lasso technique with internal sutures proposed by Dr. Neiva[3] or titanium tacks as mentioned by Dr. Benic[4]. GBR with simultaneous implant placement may be considered for failed sites with consideration for primary wound closure, angiogenesis, space maintenance, and stability[5] to restore the patient's function

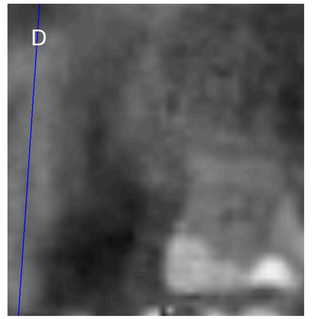
Methods

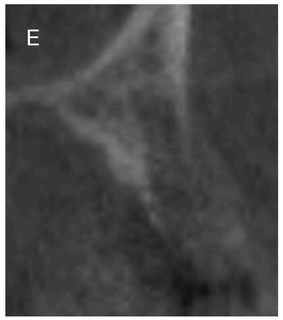
A 53-year-old patient presented with a chief complaint of wanting to restore site #13. The initial implant, placed three months prior, was lost within three weeks post-surgery, resulting in a bony architectural defect. CBCT revealed poor alveolar remodeling and GBR would be required. This case explores the use of GBR with simultaneous implant placement as a method to restore the alveolar ridge for a previously affected, lack of osseointegration, implant site. Alongside the bone particulate, long-lasting resorbable membrane, and stabilizing tacks, a 3.6mm x 11mm implant was placed and allowed to heal for 6 months











Figures A-H: (A-B) Pre-operative views (C) View from CBCT with measurements of the bony architectural defect from the early implant loss (D-E) Additional radiographic views of defect without measurements (F) Flapped, notable defect present with deficient buccal plate of future implant

References

1. Oh, Tae-Ju, et al. "The Causes of Early Implant Bone Loss: Myth or Science?" Journal of Periodontology., vol. 73, no. 3, 2002, pp. 322–33, https://doi.org/10.1902/jop.2002.73.3.322
2. Thoma DS, Bienz SP, Figuero E, Jung RE, Sanz-Martín I. Efficacy of lateral bone augmentation performed simultaneously with dental implant placement: A systematic review and meta-analysis. J Clin Periodontol. 2019; 46(Suppl. 21): 257–276
3. Neiva, Rodrigo, et al. "LASSO GBR – Rationale, Technique, and Long-term Results." Clinical Oral Implants Research., vol. 29, no. S17, 2018, pp. 447–447, https://doi.org/10.1111/clr.332_13358
4. Benic, Goran I., and Christoph H. F. Hämmerle. "Horizontal Bone Augmentation by Means of Guided Bone Regeneration." Periodontology 2000., vol. 66, no. 1, 2014, pp. 13–40, https://doi.org/10.1111/prd.12039
5. Wang HL, Boyapati L. "PASS" principles for predictable bone regeneration. Implant Dent. 2006 Mar;15(1):8-17. doi: 10.1097/01.id.0000204762.39826.0f. PMID: 16569956

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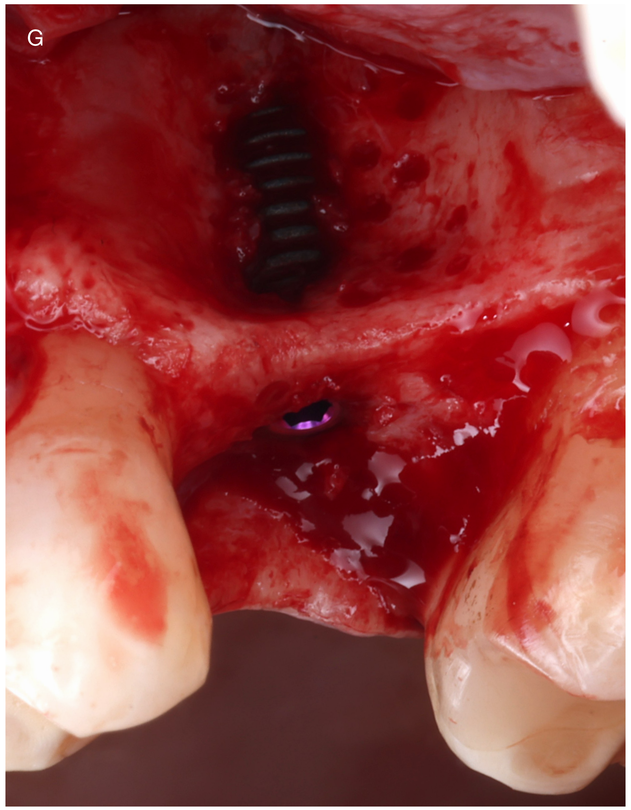

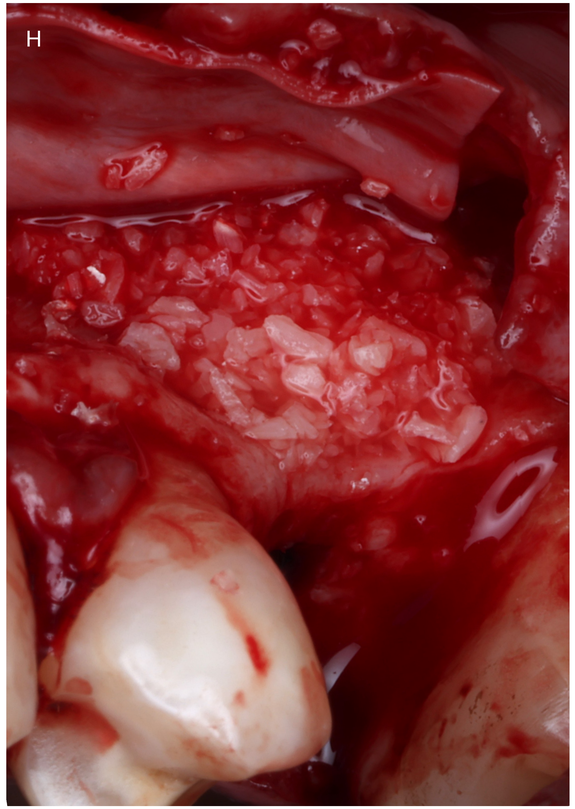

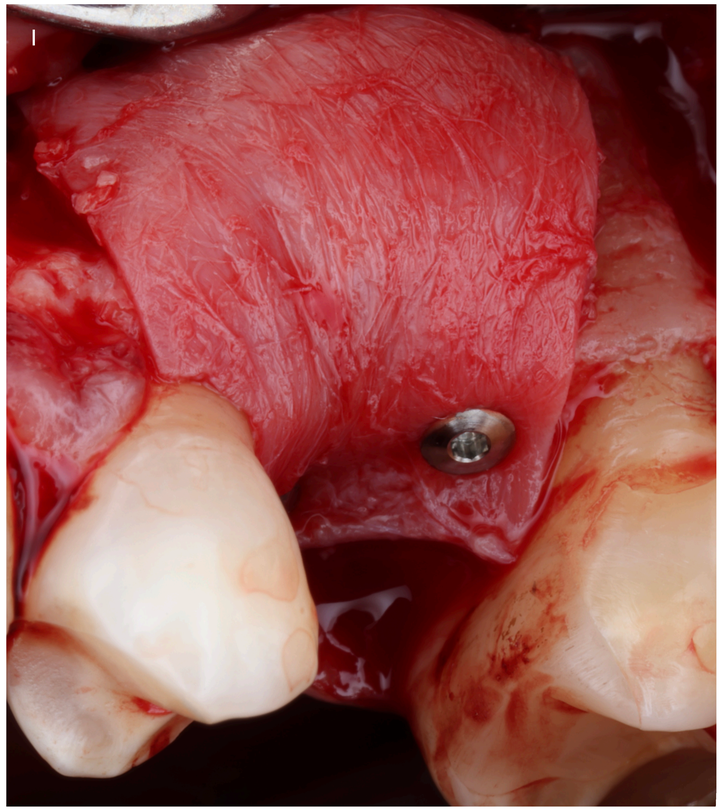

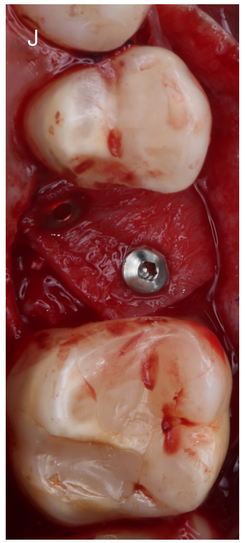

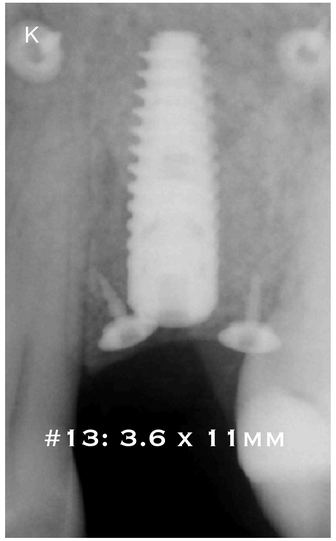

Figures G-K: (G) Decorticated surgical site followed by the placement of a 3.6mm x 11mm dental implant, the use of a cover screw, and note the existing fenestration leading to visualization of exposed buccal threads (H) Bone particulate allograft selected for augmentation of the defect, followed by positioning of a trimmed, resorbable, long-lasting pericardium membrane (I) Four tacks used to stabilize the pericardium membrane at apical and occlusal positions (J) Occlusal view of implant placement and guided bone regeneration (K) Periapical radiograph of implant #13 with cover screw and stabilizing tacks.

References

1. Oh, Tae-Ju, et al. “The Causes of Early Implant Bone Loss: Myth or Science?” Journal of Periodontology., vol. 73, no. 3, 2002, pp. 322–33, https://doi.org/10.1902/jop.2002.73.3.322
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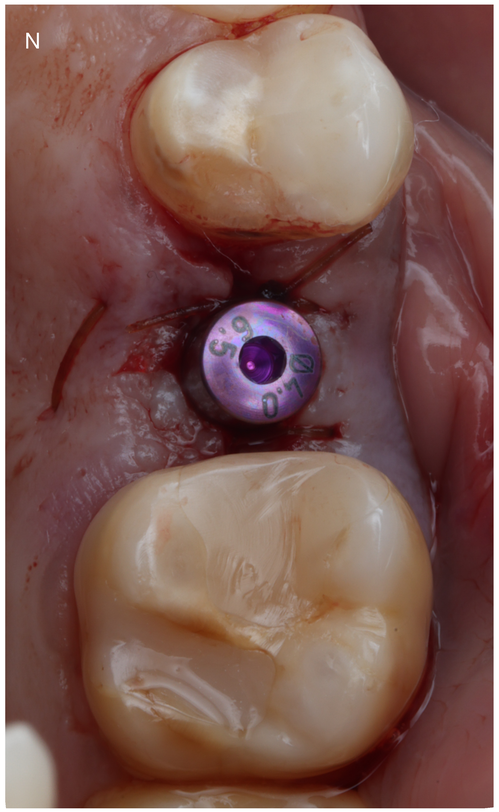

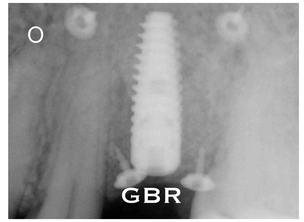

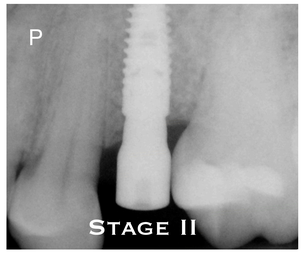

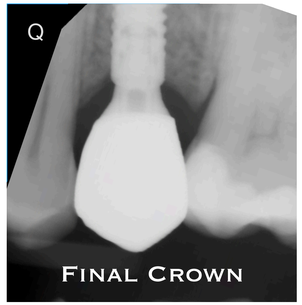

Figures L-Q: (L) Pre-operative view, 6 months post-GBR (M) Midcrestal incision with flap reflection, removal of stabilization tacks (N) Stage II implant surgery completed with removal of cover screw and replacement with healing abutment, sutured with chromic gut (O) Periapical radiograph at the time of GBR with implant #13 and use of tacks to stabilize the pericardium membrane (P) Periapical radiograph with healing abutment in place at stage II (Q) Periapical radiograph of final implant crown fully seated

Results

6 month follow-up showed clinical and radiographic findings consistent with implant integration. No exposure of the membrane or infection occurred. Stable occlusal tacks were removed at stage II. Final impressions were later taken, followed by the delivery of the permanent screw-retained implant crown. Patient-centered care was optimized and the treatment time was significantly reduced in comparison to alternative approaches of guided bone regeneration followed by staged implant placement.

Conclusion

The results presented from this case may offer a reliable solution for patients with prior implant failures. Simultaneous implant placement with guided bone regeneration in failed implant sites may be a treatment modality for consideration in reducing the amount of surgical intervention to augment hard tissue for implant support.

References

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