EP002

Shared Decision-Making and Adherence in Complex Implant Rehabilitation with Compromised Alveolar Bone Housing



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INTRODUCTION

Implant success in high-risk clinical scenarios depends heavily on the biological limits of the alveolar bone housing (ABH), which is naturally thin in the anterior maxilla.
Alongside biological constraints, behavioral factors such as transparent risk communication and patient adherence are equally vital for long-term success.

CASE REPORT

Patient: A 40-year-old systemically healthy male with a fractured maxillary left central incisor (tooth 21).
Pre-Surgical Phase: Initial assessment revealed moderate periodontitis (BPE 3), managed with non-surgical periodontal therapy and intensive oral hygiene instruction.
Surgical Phase 1 - Extraction and Ridge Preservation: Atraumatic extraction performed using periotomes, followed by immediate Alveolar Ridge Preservation (ARP) using bovine-derived xenograft (Geistlich Bio-Oss®) and a collagen plug. An immediate partial denture, relieved over the surgical site, was provided for the 5-month healing period.
Surgical Phase 2 - Implant Placement & GBR : Five months post-extraction, a radiographic assessment was performed using an IOPA to evaluate the healed site. The IOPA (Figure 1) revealed the vertical bone height and proximity to the incisive canal. Despite ARP, significant buccal bone resorption occurred. Using a **Shared Decision-Making (SDM) protocol**, the patient was transparently informed of a guarded prognosis due to the severe defect. Flap reflection revealed a significant buccal dehiscence (Figure 2). A 3.3 mm Straumann® Bone Level Tapered (BLT) implant was placed and strategically angled toward the preserved palatal wall of the alveolar bone housing (ABH) to achieve apical stability. Simultaneous Guided Bone Regeneration (GBR) was performed with Bio-Oss® and a Geistlich Bio-Gide® collagen membrane (Figure 3), with tension-free primary closure.
Outcome: After 6 months, the implant showed excellent stability (Figure 4). A screw-retained ceramic crown was issued via a digital workflow (3Shape TRIOS®)(Figure 5). At the 6-month follow-up, bone levels were stable and the patient was highly satisfied.


FIGURE 1

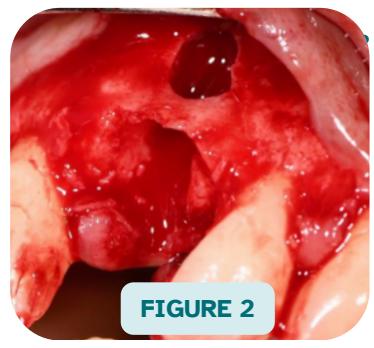

FIGURE 2


FIGURE 3


FIGURE 4


FIGURE 5

DISCUSSION

- **Role of ABH:** Complete loss of the buccal plate is common when the initial facial alveolar bone thickness is <1 mm. However, the initial ARP maintained enough overall ridge volume to allow for the secondary one-stage GBR.
- **Primary Stability:** By strategically placing the implant more palatally and utilizing the preserved apical 3 mm of the ABH, sufficient mechanical torque was achieved for stability despite severe buccal resorption.
- **Systemic Synergy:** The biological success of the slow-resorbing bone graft was highly dependent on the host's regenerative capacity. This was enhanced by advising the patient to supplement with Vitamin C, Vitamin D, and Calcium, combined with their drastic improvement in oral hygiene.
- **Overcoming Limitations:** Although standard 3D imaging (CBCT) was unavailable due to institutional constraints, applying sound surgical principles—like clinical ridge mapping and tension-free flap advancement—ensured clinical success.

CONCLUSION

Incorporating SDM into clinical practice and patient empowerment can successfully mitigate clinical risks. Even with a guarded prognosis due to severe bone loss, utilizing strategic positioning in the preserved ABH combined with regenerative techniques, digital precision, and strong patient adherence leads to highly successful outcomes. Mainstreaming behavioural sciences alongside sound surgical principles is essential for managing complex dental rehabilitation cases.

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