Guided Tissue Regeneration in a Vertical Bone Defect in a Patient with Periodontitis

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Introduction

Periodontitis is a chronic, multifactorial inflammatory disease that leads to the progressive destruction of the tissues that support teeth **(1).**Probing depths of more than 6 mm following scaling and root planing often indicate the presence of intrabony defects. These periodontal defects, characterised by vertical bone loss, suggest a negative prognosis for the teeth affected **(2).** In this context, the primary aim of periodontal regenerative procedures is to rebuild the supporting tissues lost due to periodontitis, thus restoring bone architecture and providing support for tooth roots **(3)** .

Guided tissue regeneration (GTR) is a regenerative periodontal procedure that aims to restore lost periodontal structures through the use of barrier membranes. The technique is based on the principle of selective cell exclusion, in which the migration of epithelial and gingival connective tissue cells into the defect site is prevented. This exclusion enables the repopulation of the root surface by cells originating from the periodontal ligament, thereby promoting regeneration of the periodontium **(4,5,6).**

Aims

This case study aims to describe GTR performed on tooth 42 to treat a three-wall vertical infrabony defect and promote supporting tissue regeneration.

Materials and Methods

A 69-year-old female patient with no relevant medical history was referred to the Periodontology Department due to the presence of a vertical infrabony defect distal to tooth 42, identified on a periapical radiograph. The tooth had previously undergone endodontic treatment. The defect was associated with a probing depth (PD) of 11 mm and bleeding on probing (BOP), and tooth 42 exhibited grade 2 mobility related to occlusal trauma. **(Image 1,2)**.

Initial treatment involved occlusal adjustment, splinting, and non-surgical periodontal therapy. A residual PD of 10 mm with BOP remained following non-surgical treatment.

Intrasulcular incisions were made, followed by decontamination of the defect using curettes **(Image 3).** Subsequent to tissue debridement, a three-wall defect measuring 9 mm in depth was identified. The bone defect was filled with xenograft (Bio-Oss® 0.25–1 mm) and covered with a non-resorbable Cytoplast® TXT-200 membrane **(Image 4)**. The flap was then repositioned and sutured with single interrupted 5/0 monofilament nylon sutures **(Image 5)**. Postoperatively, the patient was prescribed amoxicillin 1000 mg (1 pill every 12 hours for 8 days), ibuprofen 600 mg (1 pill every 12 hours for 5 days), and paracetamol 1000 mg (1 pill every 8 hours for 3 days), in addition to a 0.2% chlorhexidine mouthwash to rinse twice a day for 2 weeks, . Follow-up appointments were performed at 7 and 15 days, sutures were removed on day 15. No postoperative complications were registered. At 8 weeks post-surgery, the non-resorbable membrane was removed, and radiographic evaluation was performed.

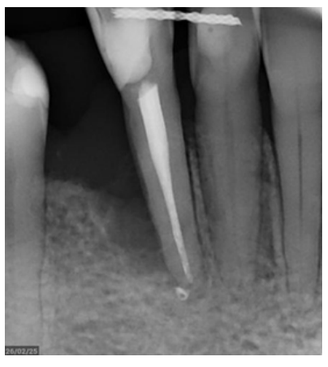

Image 1: Initial periapical radiograph showing a vertical bone defect distal to tooth 42.

Image 2A: Buccal view of tooth 42 before surgery.

Image 2B: Incisal view of tooth 42 before surgery.

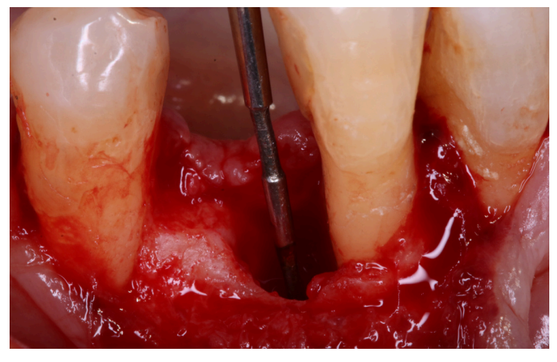

Image 3: Intrasulcular incisions were made between teeth 41 and 44 to facilitate access to the defect, following the removal of the granulation tissue.

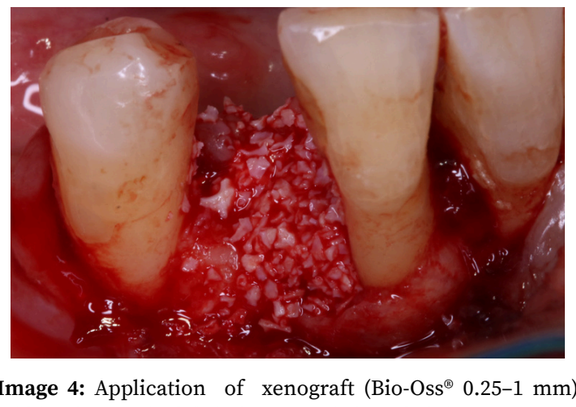

Image 4: Application of xenograft (Bio-Oss® 0.25–1 mm) within the vertical infrabony periodontal defect.

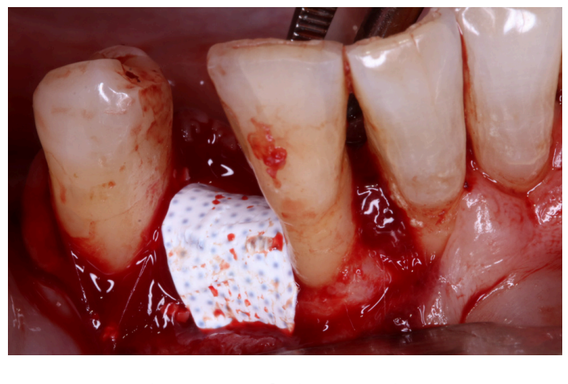

Image 5: Placement of the Cytoplast® TXT-200 non-resorbable membrane.

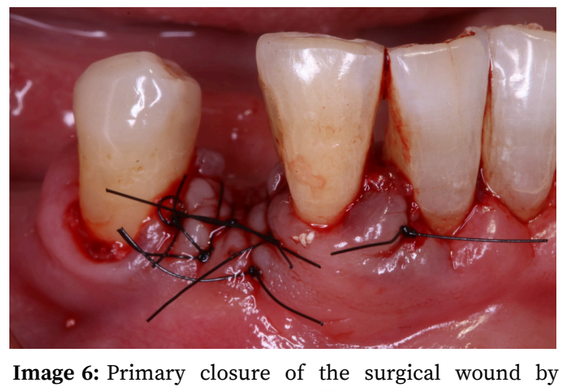

Image 6: Primary closure of the surgical wound by suturing with 5/0 nylon monofilament suture.

Results and Discussion

Radiographic analysis demonstrated evidence of considerable bone fill of the alveolar defect, quantified by a 6,2 mm increase in alveolar bone height **(Image 7)**.

Despite its technical complexity and short follow-up period, GTR demonstrated predictable outcomes in managing the vertical defect of tooth 42, consistent with existing evidence supporting its efficacy in similar cases.

Image 7: Postoperative periapical radiograph showing the filling of the bone defect distal to tooth 42.

Image 8: Postoperative intraoral clinical photograph obtained 14 weeks following surgical intervention.

Conclusions

At 6 months after treatment, PD decreased to 3 mm with no BOP, showing that GTR can be effective in repairing vertical defects and improving the prognosis of affected teeth despite the limited follow-up interval. The patient will continue to be monitored for long-term outcomes.

References