

Comprehensive Periodontal and Esthetic Rehabilitation for Functional and Esthetic Reconstruction: A Case Report

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Abstract: Periodontal rehabilitation often requires a multidisciplinary approach to restore periodontal health, function, and esthetics in patients with advanced periodontal destruction. This case report details the thorough management of a 52-year-old female patient who presented with generalized periodontitis associated with pathologic tooth migration, aberrant frenal attachments, gingival deformities, tooth mobility, and an angular intrabony defect in relation to tooth 37. The initial treatment involved scaling and root planing, oral hygiene reinforcement, and splinting of the mandibular anterior teeth. Corrective therapy consisted of maxillary and mandibular frenectomy, gingivoplasty in relation to tooth 22, endodontic therapy for tooth 37, and periodontal regenerative surgery using a xenograft. Clinical parameters, including Oral Hygiene Index-Simplified (OHI-S), modified Sulcus Bleeding Index (mSBI), probing pocket depth, clinical attachment level, and tooth mobility, were assessed at baseline and during follow-up visits. Progressive improvement in periodontal health was observed throughout the six-month follow-up period. Probing pocket depth in relation to tooth 37 reduced from 8 mm to 5 mm, accompanied by radiographic evidence of bone fill. Improved gingival contour and stabilization of mobile teeth were also achieved. The present case demonstrates that a sequential multidisciplinary approach can effectively restore periodontal health, improve esthetics, and enhance functional stability in complex periodontal cases.

Keywords: Periodontal Rehabilitation, Intrabony Defect, Xenograft, Frenectomy, Gingivoplasty, Periodontal Regeneration.

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I. INTRODUCTION

Periodontitis is a chronic inflammatory disease characterized by the progressive destruction of the supportive tissues surrounding the teeth, eventually leading to attachment loss and tooth loss if left untreated. Advanced periodontal destruction is frequently associated with additional complications such as pathologic tooth migration, mucogingival deformities, tooth mobility, and combined endodontic - periodontal lesions. Management of such conditions often requires experience. The benefits of a comprehensive, multidisciplinary approach to effective non-surgical periodontal therapy, mucogingival surgery, regenerative procedures, endodontic therapy, and supportive periodontal care.¹

Comprehensive periodontal rehabilitation aims to eliminate etiologic factors, restore periodontal stability, improve esthetics, and preserve function through sequential and carefully planned treatment phases. Regenerative procedures using bone grafts have shown favorable outcomes in the treatment of angular intrabony defects by promoting bone fill and clinical attachment gain.²

The present case report describes the successful management of generalized periodontitis associated with mucogingival abnormalities, pathologic tooth migration, and an intrabony defect using a comprehensive multidisciplinary treatment approach with a six-month follow-up.

II. CASE REPORT

A 52-year-old woman visited the Department of Periodontology and Implantology, expressing concern about pain in the lower left back tooth area, accompanied by bleeding gums that had persisted for two months. She also has a 10-year history of hypertension for which she is on medication. No history of parafunctional habits or previous periodontal therapy was reported.

Clinical examination revealed generalized plaque and calculus deposits, inflamed gingiva with bleeding on probing, pathologic migration involving teeth 22, 31, and 41, and Grade I mobility in the mandibular anterior teeth and tooth 37. High frenal attachments were present in both maxillary and mandibular regions. A localized periodontal pocket measuring 8 mm was detected in relation to tooth 37. Radiographic examination angular intrabony defect associated with tooth 37.

Baseline clinical parameters included Oral Hygiene Index-Simplified (OHI-S),³ modified Sulcus Bleeding Index (mSBI),⁴ probing pocket depth (PPD), clinical attachment level (CAL), gingival recession (GR), and tooth mobility. Based on the clinical and radiographic findings, a diagnosis of generalized periodontitis associated with localized severe periodontal destruction and vertical or angular intrabony defect seen in relation to tooth 37.

The treatment plan consisted of:

- Phase I therapy: scaling and root planing, oral hygiene instructions, and splinting of mandibular anterior teeth.
- Corrective surgical phase: maxillary and mandibular frenectomy, gingivoplasty in relation to tooth 22, endodontic therapy for tooth 37, and regenerative periodontal surgery using xenograft placement.
- Supportive periodontal maintenance and follow-up evaluations.

III. TREATMENT PROCEDURES

Following informed consent, a comprehensive scaling and root planing procedure was performed on both supragingival and subgingival areas of the mouth. Oral hygiene instructions and interdental cleaning aids were reinforced during every visit. The mobile mandibular anterior teeth were stabilized using fibre-reinforced composite splinting.

Conventional frenectomy procedures were performed in both maxillary and mandibular regions under local anaesthesia to eliminate tension from aberrant frenal attachments. Sutures were placed, and postoperative instructions included chlorhexidine mouth rinse, antibiotics, and analgesics.

Gingivoplasty was performed on tooth 22 to improve the gingival contour altered by chronic inflammation and pathologic migration. Excess gingival tissue was reshaped to restore physiologic architecture and improve esthetics.

Endodontic therapy for tooth 37 was completed before regenerative periodontal surgery to eliminate endodontic infection and facilitate periodontal healing.⁵

For regenerative therapy, a full-thickness mucoperiosteal flap was elevated in relation to tooth 37. Thorough debridement and root planing were performed, followed by placement of deproteinized bovine bone mineral xenograft (FIX-OSS) into the intrabony defect. Flaps were repositioned and secured using interrupted sutures, and a periodontal dressing was placed. Postoperative medications and oral hygiene instructions were provided.

IV. RESULTS

Clinical and radiographic evaluations were performed at one-, three-, and six-month follow-up visits. Progressive improvement in oral hygiene and gingival health was observed throughout the follow-up period. The probing pocket depth associated with tooth 37 reduced from 8 mm at baseline to 5 mm at six months, along with improvement in clinical attachment levels.

Radiographic examination demonstrated gradual bone fill within the angular intrabony defect. Mobility of mandibular anterior teeth was stabilized following splinting and periodontal therapy, while mobility of tooth 37 resolved after endodontic and regenerative treatment. Gingivoplasty and frenectomy procedures resulted in satisfactory esthetic improvement and restoration of physiologic gingival contours.

V. DISCUSSION

The present case highlights the importance of a sequential, multidisciplinary treatment approach in managing advanced periodontal destruction, which is associated with esthetic and functional complications. Initial periodontal therapy remains the cornerstone of treatment because elimination of local etiologic factors creates a favorable environment for periodontal healing and facilitates accurate reevaluation of residual defects.⁶

Splinting of mobile teeth contributes to patient comfort and functional stability during periodontal healing (Figure 1). Aberrant frenal attachments may contribute to plaque retention, gingival recession, and tension on marginal gingiva; therefore, frenectomy procedures are often indicated to improve periodontal stability⁷ (Figure 2).

Pathologic migration in the anterior region frequently affects esthetics and gingival architecture. Gingivoplasty can effectively improve gingival contours and enhance esthetic outcomes in selected cases^{8,9} (Figure 3).

Combined endodontic-periodontal lesions require elimination of pulpal infection before regenerative procedures to improve treatment predictability. In the present case, regenerative therapy using a xenograft demonstrated favorable clinical and radiographic outcomes (Figure 4), including reduced probing depth and evidence of bone fill.

(Figure 5). These findings are consistent with previous studies reporting positive regenerative outcomes using xenografts in intrabony defects.^{10,11} The figure illustrates the progression and changes observed from the initial state to the outcomes after the completion of all the aforementioned treatments, evaluated over 6 months. (Figure 6). Recent literature has further emphasized the value of comprehensive periodontal rehabilitation and multidisciplinary treatment planning in achieving predictable clinical, functional, and esthetic outcomes in complex periodontal cases.¹² Recent case reports published in the literature have also demonstrated the effectiveness of multidisciplinary periodontal procedures in improving periodontal health and esthetic outcomes, further supporting the treatment approach adopted in the present case.¹²

Although the present report demonstrated favorable short-term outcomes, long-term follow-up studies are necessary to evaluate the stability of regenerated tissues and periodontal health over time.

VI. CONCLUSION

A comprehensive multidisciplinary treatment approach involving non-surgical periodontal therapy, mucogingival correction, gingivoplasty, endodontic treatment, and regenerative surgery successfully restored periodontal health, esthetics, and functional stability in this patient. Accurate diagnosis, sequential treatment planning, and supportive periodontal care remain essential for the successful management of complex periodontal cases.

➤ *Conflicts of Interest*

The authors declare no conflicts of interest.

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FIGURE LEGENDS

- Figure 1: Splinting of lower anterior teeth (fibre splint)
- Figure 2: Preoperative, intraoperative, and postoperative pictures of the maxilla and mandible frenectomy.
- Figure 3: Anterior maxilla gingivectomy and gingivoplasty, pre-operative and post-operative.
- Figure 4: Regenerative procedures for treating bone defects related to 37.
- Figure 5: Preoperative and postoperative radiographs of 37 at baseline, 1, 3 and 6 months
- Figure 6: Final images of the initial state and 6 months after follow-up after all surgical procedures.



Fig 1 Lower Anterior Splinting

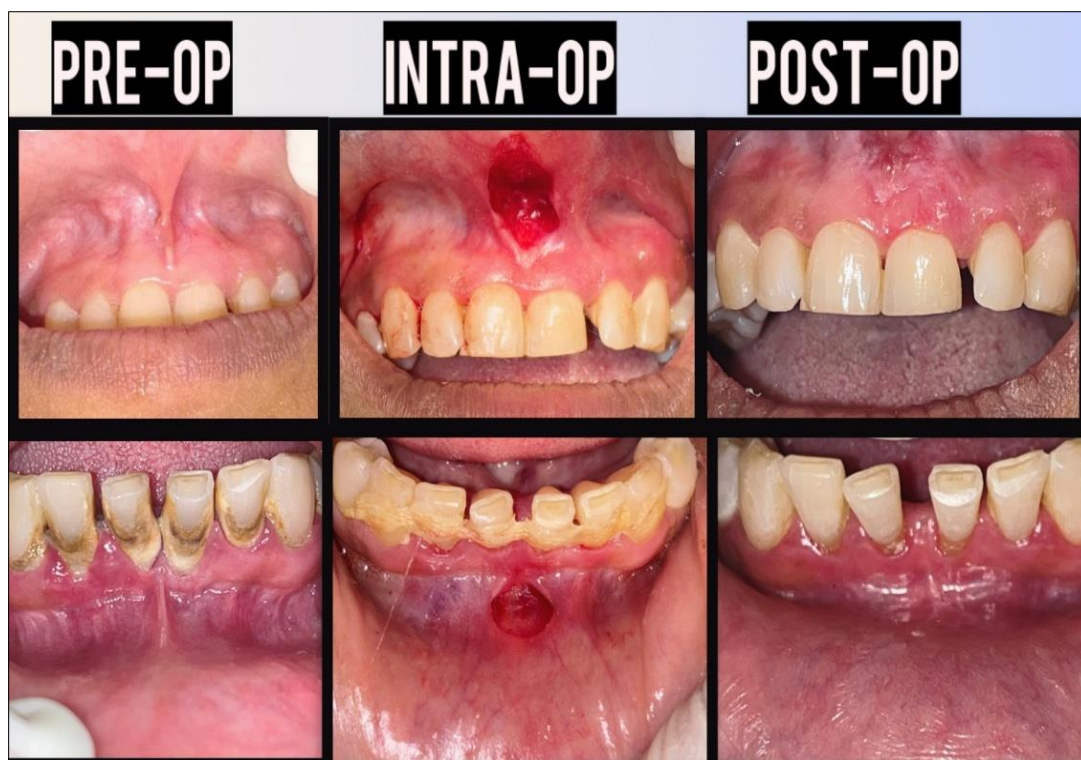


Fig 2 Maxilla and Mandible Frenectomy

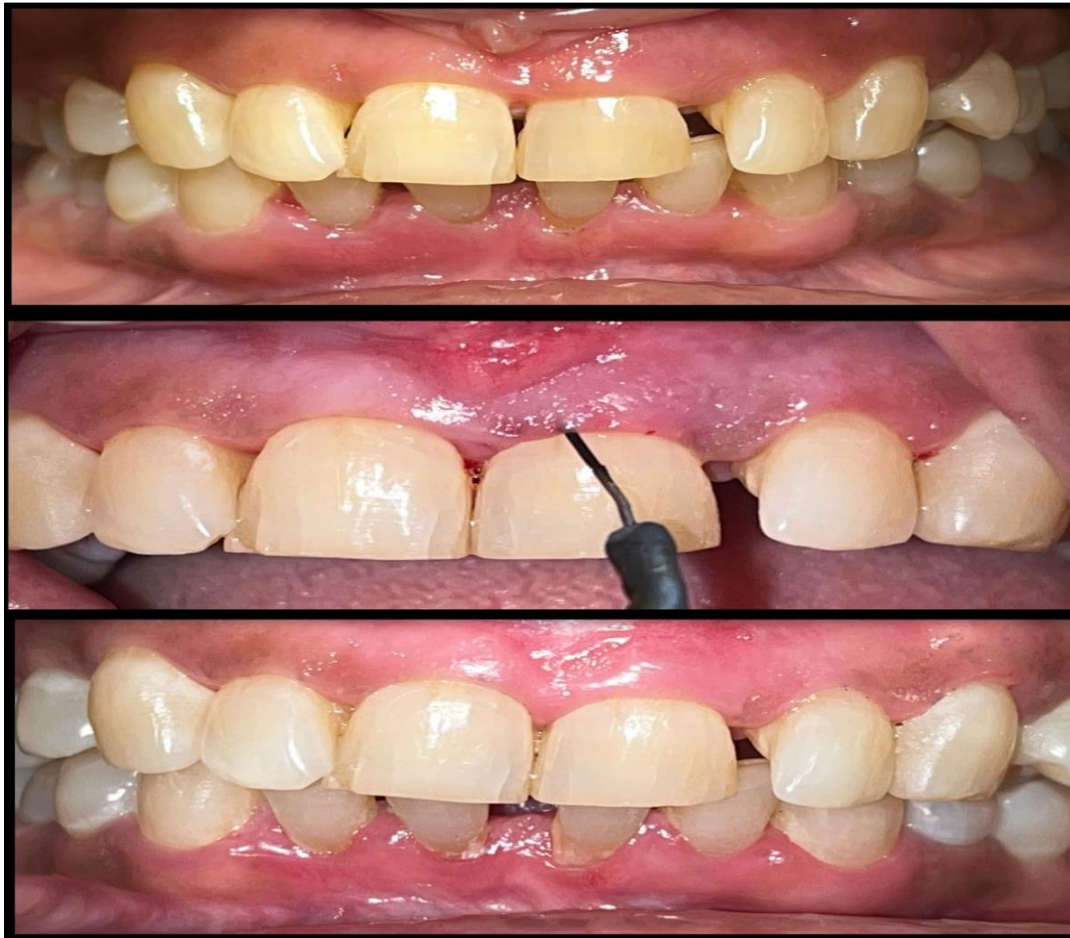


Fig 3 Anterior Gingivectomy and Plasty



Fig 4 Regenerative Procedure in Relation to 37

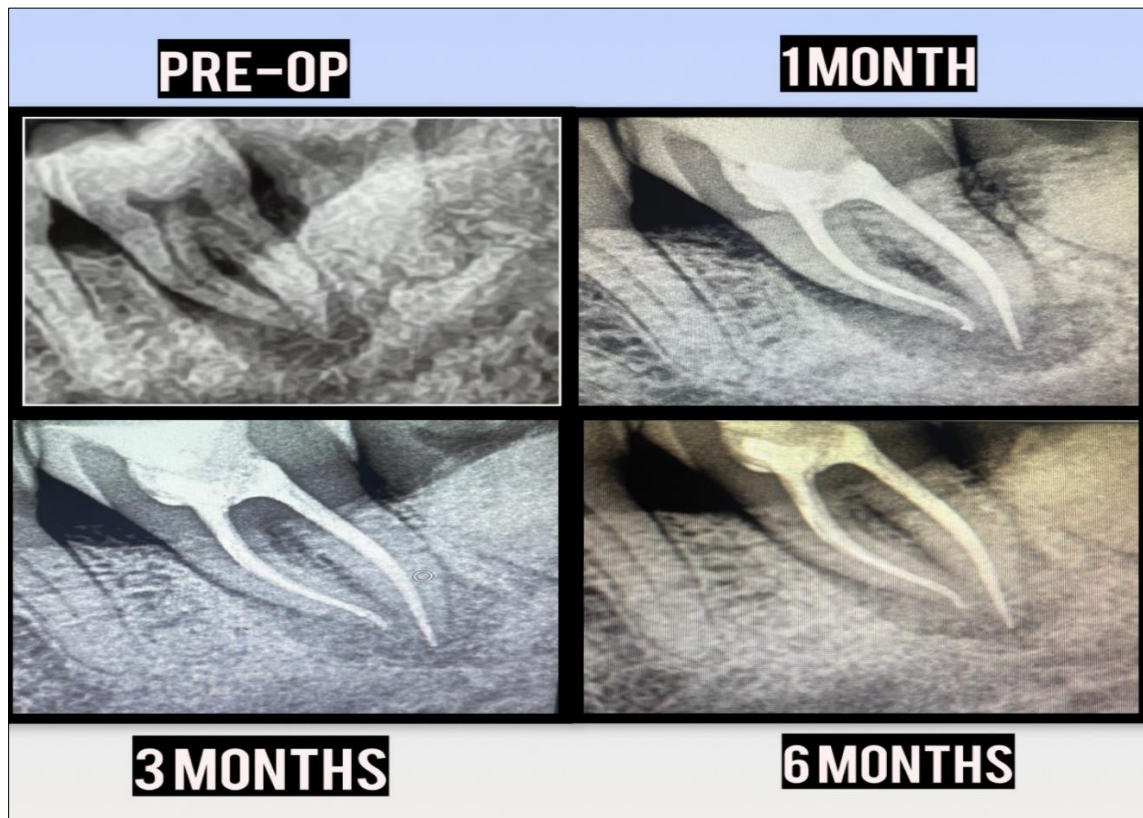


Fig 5 Radiographic Changes from Base Line to 6 Months



Fig 6 Pre and Post-Surgical Comparison After Six Months of Completing all Clinical Procedures