

CASE REPORT: ANTERIOR AESTHETIC REHABILITATION WITH CROWN LENGTHENING

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ABSTRACT

Aesthetic rehabilitation of anterior teeth is essential for restoring function, form, and the patient's self-esteem. This case report describes a comprehensive interdisciplinary approach for the management of compromised maxillary anterior teeth in an 18-year-old male patient with a history of facial trauma. The treatment plan incorporated non-surgical root canal therapy, orthodontic extrusion, surgical flap repositioning, post and core build-up, and final restoration using lithium disilicate crowns. Orthodontic extrusion allowed conservative crown lengthening while preserving the biological width, and mucoperiosteal flap surgery corrected gingival overgrowth and improved crown-root ratios. The use of fiber posts and composite resin cores ensured adequate support for the prostheses. Lithium disilicate crowns were chosen for their superior aesthetic and mechanical properties. This interdisciplinary approach led to a successful functional and aesthetic outcome, emphasizing the value of

integrating endodontics, periodontics, orthodontics, and prosthodontics in complex anterior restorations.

Keywords: Crown lengthening, Orthodontic extrusion, Aesthetic rehabilitation, Fiber post, Lithium disilicate, Anterior restoration.

INTRODUCTION

Aesthetic rehabilitation of anterior teeth plays a crucial role in restoring both function and appearance. This case report details the interdisciplinary approach used for the management of compromised anterior teeth, involving orthodontic extrusion, surgical flap repositioning, post and core build-up, and final prosthetic restoration. The objective was to achieve optimal crown length, maintain periodontal health, and enhance aesthetics.

Case Presentation

A 18-year-old male patient presented with broken upper front teeth requiring aesthetic and functional rehabilitation. The patient had a history of trauma to the left side of the

face in the last 3 months which led to difficulty opening mouth and radiating pain on left side of face.

On clinical examinations there was unesthetic appearance of the maxillary anterior teeth, with insufficient clinical crown height. A comprehensive treatment plan incorporating non-surgical root canal treatment, crown lengthening by orthodontic extrusion and surgical intervention was devised



(A)



(B)



(C)

Fig 1 A) Preoperative radiograph, Pre operative images of B) Buccal view C) Occlusal view

Clinical and Radiographic Examination

1) Pre-operative Clinical Findings:

- The patient exhibited compromised crown length in the maxillary anterior region. (Fig 1 b, c)
- Buccal and occlusal clinical views showed insufficient coronal structure for restoration.
- Gingival architecture appeared uneven, requiring periodontal intervention.
- Radiographic Examination:
 - Pre-operative intraoral periapical radiographs (IOPAR) were taken to assess root length, bone levels, and periapical status. (Fig 1 A)

Treatment Procedure

1. Root canal treatment:

- Working length determination (Fig 2 A)
 - Tooth 21: 16 mm
 - Tooth 22: 17 mm
- Root canal preparation:
 - Initial binding file: #15/0.02
 - Master apical cone: #40/0.06
 - Obturation was done using lateral compaction using Adseal .(Fig 2 B)

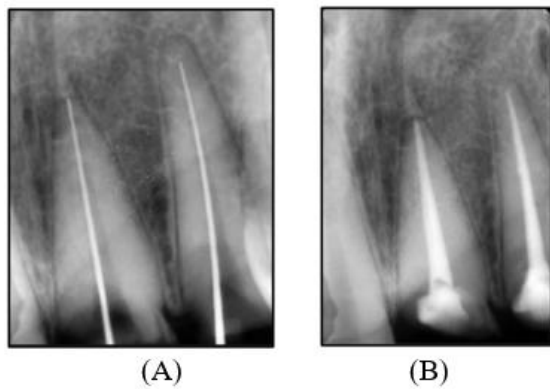


Fig 2 A : working length determination B) Obturation done using lateral compaction

2. Orthodontic Extrusion:

- A 0.8 mm stainless steel wire was shaped into a 'J' form and cemented inside the canal using flowable composite to facilitate controlled extrusion. (Fig 3 A-D)
- Gutta-percha was removed 4 mm from the coronal third of the root to accommodate the wire.
- Orthodontic extrusion was initiated using elastic bands. (Fig 3E)
- A follow-up after five months revealed successful extrusion but also gingival overgrowth, necessitating periodontal intervention. (Fig 3F)



(D)



(E)



(F)

Fig 3 A) 0.8mm stainless steel wire in 'J' shape, B) & C) Wire cemented inside canal using flowable composite, D) Radiographic image 0.8mm stainless steel wire in 'J' shape cemented inside canal using flowable composite, E) Orthodontic extrusion using elastic bands, F) Orthodontic extrusion after 5 months follow up gingival overgrowth seen



(A)



(B)

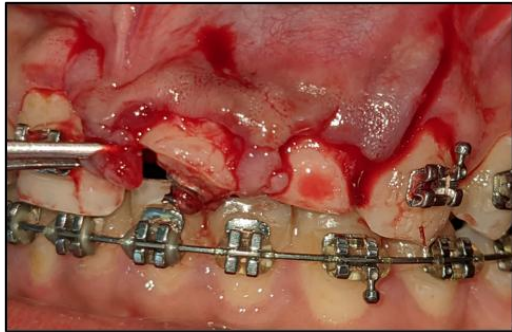


(C)

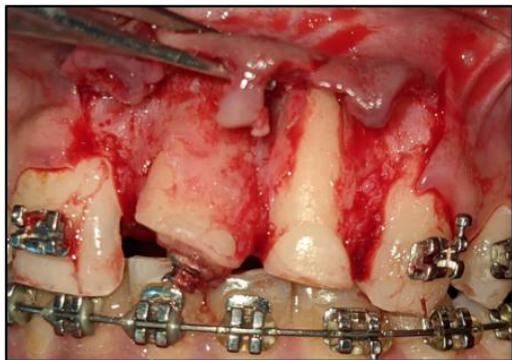
3. Surgical Flap Repositioning:

- To correct the excessive gingival display and ensure proper crown length, a surgical flap repositioning procedure was performed.
- Crevicular and vertical incisions were made to raise a mucoperiosteal flap. (Fig 4A,B)
- The flap was apically repositioned and secured using 4.0 silk sutures. (Fig 4D)

- d) Clinical and radiographic evaluations were done to confirm appropriate flap positioning and healing.



A)



B)



C)



D)

Fig 4; A) Crevicular and vertical incisions raising a mucoperiosteal flap, B) Apically repositioned flap, C) Suture placed

4. Post Space Preparation and Core Build-Up:

- Following adequate healing, post space preparation was performed using a #3 Peeso reamer.
- A #2 fiber post was selected and placed to enhance retention and support for the final restoration.
- Composite resin was used to build up the coronal structure, ensuring adequate support for the final prosthesis. (Fig 5)



Fig 5: Post operative image after placement of Fibre post and core build up using composite

5. Final Restoration:

- The final prosthetic restoration was planned using lithium disilicate (Emax) crowns for superior aesthetics and durability.
- The crowns were cemented with resin-based luting cement to ensure optimal retention and marginal adaptation.
- Post-operative clinical views were documented, showing successful rehabilitation of the anterior teeth. (Fig 6 A-C)

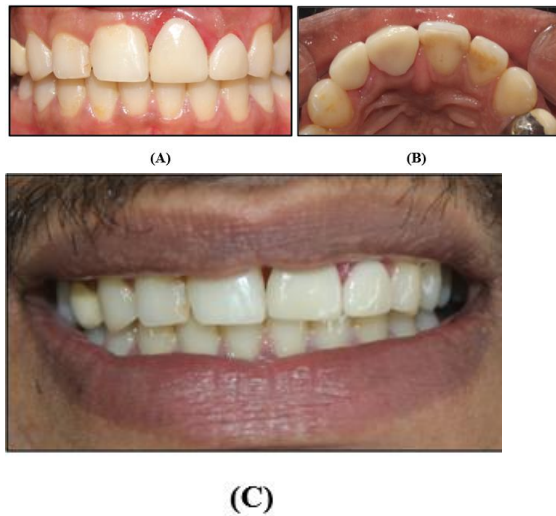


Fig 6: A) Crown cementation, B) occlusal view of crown cementation, C) Social smile

Follow-Up and Outcome

- **One-month follow-up:** The post-operative images demonstrated satisfactory healing, with well-adapted gingival contours and stable prostheses.
- **Final outcome:**
 - The patient achieved a significant improvement in aesthetic appearance with natural-looking anterior teeth.
 - Functional stability was restored, with no reported discomfort.
 - The treatment successfully met both functional and aesthetic goals.

DISCUSSION

This case highlights the importance of a multidisciplinary approach in managing complex anterior aesthetic rehabilitation cases. Orthodontic extrusion provided a

conservative alternative to surgical crown lengthening by gradually repositioning the tooth coronally while maintaining bone support. This technique not only preserved the biological width but also minimized the need for aggressive osseous recontouring.

One of the key challenges encountered in this case was the gingival overgrowth observed after orthodontic extrusion. This necessitated a surgical intervention to reposition the gingival margin and create an optimal crown-to-root ratio. The use of a mucoperiosteal flap with apical repositioning effectively addressed this issue, ensuring a stable and healthy periodontal condition.

Post space preparation and fiber post placement played a crucial role in reinforcing the remaining coronal tooth structure. The selection of a fiber post was advantageous due to its superior mechanical properties, such as lower modulus of elasticity, which helped distribute stress more evenly and reduced the risk of root fracture. Composite core build-up further enhanced the retention and stability of the final prosthesis.

The choice of lithium disilicate (Emax) crowns was made due to their excellent aesthetics, high strength, and superior wear resistance. These crowns closely mimic natural tooth translucency and provide long-term durability, making them an ideal choice for anterior restorations.

The overall success of this treatment can be attributed to careful case selection, meticulous execution of each procedural step, and regular follow-up. The integration of orthodontics, periodontics, and prosthodontics enabled the restoration of

both function and aesthetics, ultimately enhancing the patient's confidence and quality of life.

CONCLUSION

This case illustrates the effectiveness of combining orthodontic extrusion with surgical flap repositioning for crown lengthening. This interdisciplinary approach allowed for an optimal balance between periodontal health, structural integrity, and aesthetic enhancement. The use of fiber posts and lithium disilicate crowns contributed to a durable and natural-looking restoration, ultimately improving the patient's smile and overall confidence.

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