CASE REPORT

Orthoperio Management for a Patient with Aggressive Periodontitis: A Multidisciplinary Case Report

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Abstract

Introduction: The goal of orthodontic treatment is not only to improve facial esthetics and function but also to address the health of supporting structures and how teeth are placed in them. The interrelationship between ortho and perio often resembles symbiosis.

Case description: A 21-year-old female patient reported with the chief complaint of forwardly placed upper front teeth and increasing frontal spacing in the maxillary teeth. She had a mild convex profile with a posterior divergence of the face.

Results: The occlusal examination revealed Angle's class I molar relationship bilaterally. The upper incisors showed pathologic anterior migration and extrusion of right central incisor, impacted 23 and crossbite in relation to 22 and 24, whereas the lower arch segment demonstrated mild spacing in the incisor region.

Discussion: Periodontal findings were 5–7 mm of generalized pocket depth 13 mm in 11 and 12 mm in 26. The periodontal treatment comprised regular reinforcement of oral hygiene instructions, supragingival scaling, and full mouth open flap debridement. Six-month postperiodontal therapy, orthodontic treatment was initiated and space closure was performed using light continuous force.

Conclusion: Posttreatment results showed significant improvement in the extraoral features with competent lips and an average over jet and overbite with sufficient space for the replacement of 11.

Keywords: Aggressive periodontitis, Light continuous force, Oral hygiene, Pathologic migration.

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Introduction

The goal of orthodontic treatment is not only to improve facial esthetics and function but also to address to the health of supporting structures and how teeth are placed in them. Interaction between different specialties in dentistry is extremely important in establishing diagnosis and treatment planning. The interrelationship between ortho and perio often resembles symbiosis. The orthodontic treatment is a bipartite procedure, regarding the periodontal tissues, so it is of utmost importance to assess the need and outcomes of interdisciplinary approach in different physiologic, pathologic, or deliberate alterations in tooth positions to maintain harmonious periodontal and orthodontic relations. The successful orthodontic treatment with esthetic and functional results using fixed appliances includes periodontal therapies, such as periodontal flap debridement.[1]

The long- and short-term outcomes of successful orthodontic treatment are influenced mainly by the patient's periodontal status before orthodontic therapy, during orthodontic therapy and after active orthodontic therapy that includes the postorthodontic treatment maintenance by the patient.[2]

This clinical report describes an interdisciplinary (periodontics and orthodontics) approach for the treatment of a periodontally compromised patient with incisor migration and anterior spacing. One of the common causes of periodontitis is increased proclination and irregular spacing and traumatic occlusion. The patients with poor periodontal health and pathologic migration should be coevaluated by orthodontist and periodontist together to make a treatment plan that is individualized to the patient, keeping the treatment needs in mind.

Case Description

A 21-year-old female patient reported to the Department of Orthodontics and Dentofacial Orthopaedics, Indira Gandhi Institute of Dental Sciences, with the chief complaint of forwardly placed upper front teeth with increasing frontal spacing. There was no history of medical ailments. Extraoral examination revealed no gross facial asymmetry, incompetent lips with interlabial gap of 4 mm. She had a mild convex profile with a posterior divergence of the face. The occlusal examination revealed Angle's class I molar relationship bilaterally. The upper incisors showed pathologic anterior migration and extrusion of right central incisor, impacted 23 and crossbite in relation to 22 and 24, whereas the lower arch segment demonstrated mild crowding in the anteriors (Fig. 1). Periodontal examination and charting were performed, including the assessment of probing depths, clinical attachment levels, full mouth bleeding, and plaque scores. The other findings were reddish-pink color gingiva with brownish pigmentation and erythematous in relation to 11, 33 with pus discharge in relation to 11 on digital pressure. Periodontal

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Figs 1A and B: Pretreatment photographs: (A) Extraoral; (B) Intraoral

Figs 2A and B: Pretreatment photographs: (A) Orthopantomogram; (B) Intraoral periapical radiograph of irt 26

Figs 3A to C: Procedure involving: (A) Elevation; (B) Debridement; (C) Suturing

findings were 5–7 mm of generalized pocket depth (horizontal bone loss) 13 mm in 11 and 12 mm in 26 (vertical bone loss) (Fig. 2). Mobility test revealed grade III mobility in 11 with labial pathologic migration [secondary trauma from occlusion (TFO)] and grade I mobility in 31, 32, 41, and 42. Given the presented information, a diagnosis of generalized aggressive periodontitis with anterior dental spacing was made. Before starting periodontal treatment, extraction of 11 was done due to its very poor prognosis (Fig. 3). The cephalometric analysis revealed class I skeletal base with proclined upper and lower anteriors with protrusive lips.

Treatment Objectives

Periodontal

- To reduce pocket depth.
- To enhance clinical attachment level.
- To maintain good oral hygiene and plaque control.

Orthodontic

- To correct anterior spacing.
- To correct cross-bite with respect to 22 and 24.
- To align the palatally impacted canine.
- To correct proclination on upper and lower teeth.
- To achieve ideal overjet, overbite and obtain class I incisor relation.
- To harmonize soft tissue profile.

Treatment Plan

Since, the patient was diagnosed with aggressive periodontitis along with pathologic anterior migration, the treatment was planned to be done in two phases, the first being the periodontal phase followed by the second orthodontic phase.

Periodontal Treatment

Emergency Phase

Extraction of 11

Phase I

Scaling and root planning
Antibiotic therapy
Maintenance of phase I
Reevaluation of phase I therapy

Phase II

Full mouth open flap debridement
Maintenance of phase II
Reevaluation of phase II therapy

Phase III

Replacement of missing tooth
Maintenance of phase III
Reevaluation of phase III therapy

Phase IV

Reevaluation every 3 months

Orthodontic Treatment

Fixed appliance therapy with PEA MBT 0.022″ slot with Extraction of 14 and 24; 34 and 44

Treatment Progress

The periodontal treatment comprised oral hygiene instructions, supragingival scaling, and full-mouth open flap debridement (Fig. 4). After periodontal treatment, the patient acquired good plaque control and clinically healthy gingiva. Probing depths were reduced with no signs of bleeding.

Six months after periodontal surgery, orthodontic treatment was started with 0.022″ × 0.028″ preadjusted edge-wise appliance [Mclaughin, Bennett, Trevisi (MBT) Prescription]. Orthodontic treatment was started with the use of very light continuous force.

- Leveling and aligning (9 months).
- Space closure and retraction (10 months).
- Finishing and settling (6 months),

During the initial alignment and leveling stage (6 months), extraction of all four premolars were planned to correct the protrusive soft tissue profile and to create space for the eruption of impacted 23 (Fig. 5) and correction of lower anterior crowding. As 11 was already extracted, space for prosthesis was maintained throughout the fixed appliance therapy.

The remaining space was closed by friction mechanics using a crimpable hook with elastomeric chain in 0.019 × 0.025″ stainless steel wire for 4 months followed by final finishing and detailing (Fig. 6).

Treatment Results

At the end of the orthodontic phase, the ideal overjet and overbite were achieved, correcting the anterior crossbite with sufficient space for placement of the implant in relation to missing 11 (Fig. 7). All the teeth were leveled and aligned after the therapeutic extraction of the first premolars. The patient had achieved an esthetically pleasing

Fig. 4: After extraction of 11

Fig. 5: Eruption of impacted canine

Figs 6A to C: Space closure by friction mechanics using crimpable hook

Figs 7A and B: Posttreatment in photographs: (A) Intraoral; (B) Extraoral

smile; there was a significant improvement in the patient's facial profile. The comparison between pretreatment and posttreatment cephalometric values is shown in Table 1 (Figs 8 and 9).

Discussion

In this case report, pathologic migration of maxillary incisors with spacing and proclination, impaction of left upper canines and crowding of the mandibular anterior and periodontal disease were significant. The migration of the maxillary right central incisors with grade III mobility was believed to be because of severe periodontitis, because of the patient reported no previous spacing and mobility (Figs 1 and 2).

Table 1: Comparison of pretreatment and posttreatment cephalometric values

Parameters	*Pretreatment*	*Posttreatment*
SNA angle	82°	80°
SNB angle	80°	80°
ANB angle	2°	1°
GoGn to SN (MPA)	30°	31°
U1 to NA (angle, linear)	45° and 17 mm	22° and 4 mm
L1 to NB (angle, linear)	29° and 11 mm	25° and 4 mm
Naso-labial angle	112°	107°
Upper lip thickness	14 mm	7 mm
Upper lip strain	4 mm	1 mm
Lower lip to H line	5 mm	2 mm

SNA, sella, nasion, point A; SNB, sella, nasion, Point B

Studies have shown that orthodontic treatment, in general, does not have any negative effects on periodontal tissues when good oral hygiene is maintained. Orthodontic therapy performed under lighter force systems will move periodontally compromised teeth easily; greater orthodontic forces may badly affect the periodontal membrane.[3–5] Eliminating the plaque accumulation and gingival inflammation will have a good impact on orthodontic treatment with periodontitis patients.[6,7]

Geiger et al. noted that the clinical manifestations of pathologic migration, such as rotation, elongation, and spacing/crowding of the incisors have been found in most of the patients with moderate to severe periodontal disease.[8] Previous studies have also revealed that tooth malposition is the major cause of periodontal problems and tissues has a negative influence on tooth malocclusion.[9,10]

Behlfelt et al. (2017) observed that regular oral health checkups during orthodontic treatment may be helpful in case of gingivitis and its relation to tooth alignment.[11]

Gyawali et al. (2017) concluded that in patients with aggressive periodontitis, orthodontic treatment is possible only when the disease is brought under control by periodontal therapy.[12]

Fig. 8: Postoperative orthopantomogram

In this case, initial periodontal conditions were improved by scaling and root planning in addition to flap elevation and debridement, orthodontic fixed therapy with high access to plaque control, and oral prophylaxis were initiated. In order to obtain alignment and to bring impacted 23 into occlusion, all 4 premolar extractions were performed. The stable periodontal health exhibiting probing depths <4 mm with no signs of inflammation and bleeding throughout the dentition is obtained using combined periodontal and orthodontic treatment. Also eliminating maxillary anterior spacing helped improve bone support and good access to plaque control. Long-term lingual-bonded wire retention was applied in the lower arch and in the upper arch, a modified Hawley's retainer was given as retention protocol and interim replacement for the extracted 11.

Conclusion

Periodontal-orthodontic treatment under optimal conditions may be combined for effective rehabilitation of patients with periodontal disease. The successful treatment outcome for these patients depends on periodic evaluation of the periodontal status, well-defined orthodontic treatment plan and use of light continuous forces.

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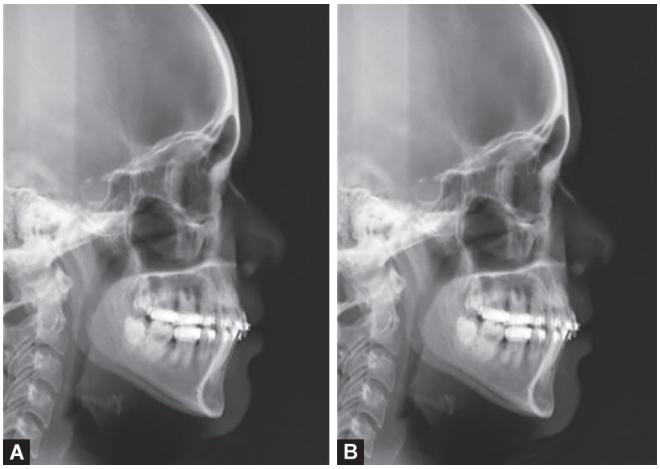

Figs 9A and B: Comparison of proclination with lateral cephalogram: (A) Pretreatment; (B) Posttreatment

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