

## Case Report

# Orthodontic–periodontics interdisciplinary nonsurgical approach to manage infrabony osseous defect

### ABSTRACT

Clinicians often encounter infrabony osseous defects that are usually best treated by periodontal surgical techniques, including bone grafting and guided tissue regeneration, with a goal of establishing a new connective tissue attachment. On occasion, infrabony osseous defect proximal to a central incisor with extrusion and large midline diastema may present an opportunity to consider a resolution by orthodontic–periodontic interdisciplinary approach. Orthodontics has been used as an adjunct to periodontics to increase connective tissue support and alveolar bone height. In modern clinical practice, the orthodontic–periodontic interdisciplinary approach is essential for optimized treatment outcomes. The purpose of this case report is to highlight the importance of orthodontic–periodontic interdisciplinary approach in clinical practice and to improve the level of cooperation between dental practitioners. The authors decided to treat an advanced case of periodontitis, with extrusion and pathological migration of a maxillary central incisor, using orthodontic–periodontic interdisciplinary approach. After the nonsurgical conventional periodontal therapy, the orthodontic movement was started, and the incisor was repositioned using an intrusive mechanism. There was a significant clinical decrease in the probing depth values, and radiographs showed a remarkable reduction of the infrabony osseous defect.

**Keywords:** Interdisciplinary, intrusion, periodontal pocket

### INTRODUCTION

Many adult periodontal patients may present with the loss of teeth or periodontal support that can result in pathological teeth migration involving either a single tooth or a group of teeth. The main objective of periodontal therapy in these patients is to restore and maintain the health and integrity of the periodontium, whereas orthodontic treatment may represent an important part to correct these problems, or at least prevent them from progressing. Several studies investigated the role of orthodontic tooth movement on periodontal tissues.<sup>[1,2]</sup> Experimental study on animals shows that tooth movement is not able to create lost connective tissue attachment.<sup>[3,4]</sup> This may be because orthodontic forces act on the portion of the periodontium that is bordered by hard tissue on both sides, whereas the suprabony connective tissue remains unaffected.<sup>[5,6]</sup> On the other hand, loss of connective tissue attachment may take place if tooth movement is executed in the presence of plaque-induced gingival inflammation.<sup>[7,8]</sup>

A number of authors have tried to correct infrabony defects using periodontic–orthodontic interdisciplinary approach. Moreover, orthodontic intrusive displacement has the potential to reestablish a healthy periodontium and well-functioning dentition, with favorable psychological and esthetic results.<sup>[9]</sup> Orthodontic intrusive movement, after proper periodontal therapy, can also positively modify both the alveolar bone and the periodontal tissues.<sup>[10,11]</sup>

This case study describes the effect of an orthodontic–periodontic interdisciplinary approach in a case of adult periodontitis that led to extrusion and migration of a maxillary right central incisor with a large infrabony defect on its mesial aspect.

### VIVEK B MANDLIK, SURENDRA KUMAR SEWDA<sup>1</sup>

Military Dental Centre, Nashik, Maharashtra, <sup>1</sup>Graded Specialist (Orthodontics and Dentofacial Orthopedics), 310 Field Hospital, Jammu and Kashmir, India

**Address for correspondence:** Dr. Vivek B Mandlik, C-6/13, Salunkhe Vihar, Pune - 411 022, Maharashtra, India. E-mail: mandlik@hotmail.com

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## CASE REPORT

A 36-year-old female reported at the dental outpatient department with a chief complaint of loose and highly placed right upper front tooth.

Extraoral examination revealed mild symmetrical, mesoprosopic face, straight profile, and extruded right central incisor creating functional and esthetic problems such as lip incompetency, unpleasant smile, and difficulty in incising the food substance [Figure 1].

Intraoral examination revealed extruded right central incisor with Grade II mobility, pathological migration of 11, trauma from occlusion, midline diastema, Class I canine relation, missing 26, 36, and 46, moderate fluorosis, overjet 0 mm, and 50% overbite irrespective to 11; initial probing depth on the mesial surface of the right central incisor was 8 mm, while gingival recession was 3.0 mm [Figure 2].

Intraoral periapical radiographic examination revealed a deep infrabony angular osseous defect [Figure 3].

Problem list includes trauma from occlusion, extrusion, and infrabony pocket of right maxillary central incisor midline diastema, pathological migration of 11, and missing 26, 36, and 46.

Treatment plan was established for this patient: (1) treatment of her periodontal disease by conventional periodontal therapy; (2) intrusion of maxillary right central incisor and closure of midline diastema by fixed orthodontic treatment; and (3) replacement of missing 26, 36, and 46 was planned with FPD because lack of bone to place prosthodontic implants.

The above-mentioned treatment plan was developed using a team approach with orthodontics, periodontics, and prosthodontics. The periodontal disease was treated by nonsurgical periodontal therapy comprising of motivation, education and oral hygiene instructions, scaling, and root planning before orthodontic treatment. Subsequently, after 8 weeks, on resolution of periodontal inflammation, orthodontic therapy was carried out. Orthodontic therapy consists of preadjusted edgewise appliance ("0.018" bracket slot) with Roth prescription. Posterior bite plate was given to relive trauma from occlusion to right central incisor. Leveling and alignment of all the teeth except right central incisor was done by sequentially using 014" NiTi, 016" NiTi, and 016" stainless steel. Then, 016 × 022" stainless wire was used as base archwire; conventional anchorage preparation was done by consolidation of teeth by continuous ligation from



Figure 1: Pretreatment extraoral photograph



Figure 2: Pretreatment intraoral photograph



Figure 3: Pretreatment intraoral periapical radiograph

second premolar to lateral incisor on the right side and on the left side continuous ligation from the second premolar to the left central incisor. After anchorage preparation, special attention was given while intrusion of right central incisor and intrusion was done by using very light continuous intrusive

force with overlay 012” NiTi wire and the consolidated base archwire was used as anchorage. Finally, space closure was done with loop mechanics using continuous T loop of 017 × 025 TMA wire as shown in Figure 4, and replacement of missing 26.36 and 46 was done with fixed partial denture.

At the end of treatment, the intrusion of right central incisor was observed with normal gingiva, no bleeding on probing, and normal periodontal pocket depth (2.5 mm) [Figure 5]. Intraoral periapical examination revealed significant improvement in infrabony osseous defect with reduction and almost complete fill of the infrabony defect [Figure 6].

Finally, the periodontic–orthodontic interdisciplinary approach results in significant improvement in the smile, function, and lip competency of the patient as shown in extraoral and intraoral photographs in Figures 7-9.

Periodontally compromised patients may have problems such as relapse during the retention stage, and therefore, these patients require a long period of retention. Permanent retention is often part of the total treatment plan for these patients<sup>[12,13]</sup> so that at the end of orthodontic treatment, maxillary and mandibular fixed lingual bonded retainers were given.

## DISCUSSION

The present case reports the importance of periodontic–orthodontic interdisciplinary approach in the resolution

of infrabony osseous defect in a patient affected by severe periodontal disease that causes pathological migration and extrusion of the maxillary right incisor. The pathological migration with infrabony osseous defect can be treated by conventional periodontal therapy without using any periodontal surgical approach such as periodontal flap surgery, bone grafting, and guided tissue regeneration procedure if interdisciplinary approach is taken into consideration. Comparison of pre- and posttreatment intraoral periapical radiograph of this case showed a decrease in the distance from the cementoenamel junction of the incisor to the bottom of the bone defect and significant decrease in the infrabony component of the bony defect after periodontic–orthodontic interdisciplinary treatment.

The localized loss of periodontal attachment in such patients can present with varying degrees of overeruption, tipping, rotations, pathological migration, and spacing commonly in upper incisors and they lead to traumatic occlusion. This traumatic occlusion can further cause breakdown of the periodontal tissue by continuous trauma from occlusion and aggravate the



Figure 4: Space closure with T-loop

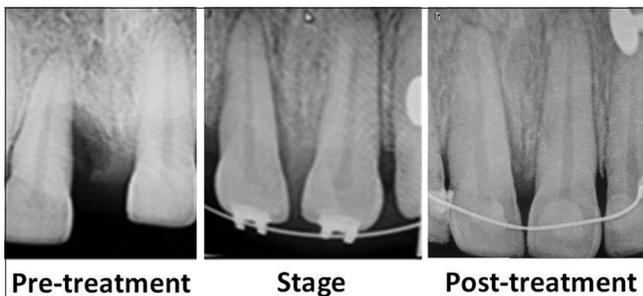


Figure 6: Pre- and posttreatment intraoral periapical



Figure 5: Posttreatment intraoral photograph



Figure 7: Pre- and posttreatment extraoral photograph



Figure 8: Pre- and posttreatment intraoral photograph

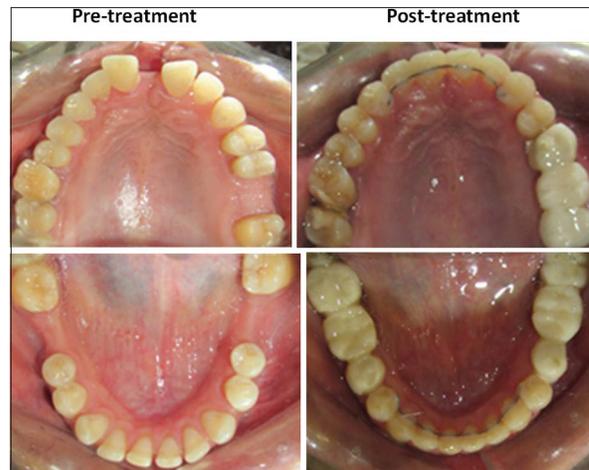


Figure 9: Pre- and posttreatment occlusal photograph

periodontal destruction.<sup>[6]</sup> Therefore, traumatic occlusion should be first relieved in such patients as done using posterior bite plate in this case to avoid continuous trauma from occlusion.

As a result of loss of bone support, the center of resistance of the involved tooth moves more apically, resulting in the tooth being more prone to tipping than desired bodily movement while orthodontic treatment mechanics.<sup>[14]</sup> The best results are obtained when tooth intrusion is performed with light forces (5–15 g per tooth), and the line of action of the force passes close to the center of resistance.<sup>[15]</sup> As in this case, intrusion was done using overlay 012” NiTi wire and the orthodontic force should produce higher moment to force ratio for more bodily movements<sup>[16]</sup> as done using continuous T loop of 017” × 025” for final space closure.

In treatment of such cases, the following factors should be taken into consideration:

- First of all, control periodontal infection and relieve trauma from occlusion<sup>[6]</sup>
- The magnitude of intrusive force should be light<sup>[15]</sup>
- Use the higher moment to force ratio for more translator/ bodily movements.<sup>[16]</sup>

## CONCLUSION

Since there is a close relationship between orthodontic treatment and periodontal health and vice versa, an understanding of the interdisciplinary approach will help in bringing the best possible results in patients with periodontitis. To prevent relapse after orthodontic treatment, lingual-bonded retainers on a long-term basis needed.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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