

## Management of an adult patient with severe periodontitis treated by orthodontic therapy -A case report

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### Abstract

Generalized periodontitis is a severe periodontal disease characterized by rapid periodontal destruction in healthy persons. Little information is available on the long-term occlusal stability for generalized periodontitis. In this case report, we demonstrated that judicious orthodontic can be useful to improve long-term stability of occlusal function and healthy periodontal tissue for generalized periodontitis. This report describes the treatment of an adult female patient with severe crowding, large overjet, and occlusal collapse due to the loss of anterior guidance with generalized periodontitis, treated for total of 19 months with Orthodontics therapy for restoration of occlusion and alignment of arches.

**Keywords:** Periodontitis, adult patient

### Introduction

Periodontitis is a common disease in patients visiting the dental clinic. Periodontal disease leads to the loss of supporting structures. When the supporting structures that maintain the physiologic tooth position are disturbed by periodontal disease, patients can have pathologic tooth migration, such as proclination, diastema, rotation, extrusion, and drifting [1]. The position of the tooth depends on the health and height of the periodontium and on the forces exerted upon the tooth, mainly the occlusion and the pressure of lips, cheeks and tongue. The main predisposing factor to PTM is the loss of periodontal support, since it represents a reduction on the resistance of a tooth to the impact of external factors. As a result, the tooth migrates and secondarily it is subjected to abnormal occlusal forces which aggravate the clinical picture [2]. The attachment loss can result in pathologic extrusion or labial inclination of the incisors, producing esthetic and functional problems for the patient. Orthodontic treatment of this disease not only

improves esthetics and function but also helps prevent inflammation and the recurrence of periodontal breakdown [3]. The key to treating affected patients is to ensure close cooperation among the multidisciplinary team, particularly the orthodontist and the periodontist, to address the patient's periodontal status before treatment and to determine the optimal timing of therapy to treat both periodontal and orthodontic problems [4].

### Case Presentation

#### Diagnosis and etiology

A 17 years female patient reported to the dept. with chief complain of forwardly placed upper front teeth.

Clinical examination revealed that patient had leptoprosopic face form with a convex profile. Patient had an average nasolabial angle, with incompetent lips and a deep mentolabial sulcus. Patient had normal maxilla and mandible. (Fig. 1)



Fig 1: Pretreatment extra oral photographs

Intra orally patient has Angle’s class I molar relation and Class II canine relation with proclined maxillary and mandibular incisors, missing mandibular 1<sup>st</sup> premolar on right side, with overjet of 12mm and over bite of 5mm (Fig.2)

**Radiographic examination (Fig.3)**

The panoramic radiograph shows significant bone loss in both the maxillary and mandibular anterior regions and vertical bone loss mandibular 1<sup>st</sup> area. There is missing mandibular 1<sup>st</sup>, root canal treatment done with 26. On lateral cephalogram examination patient has Class I skeletal

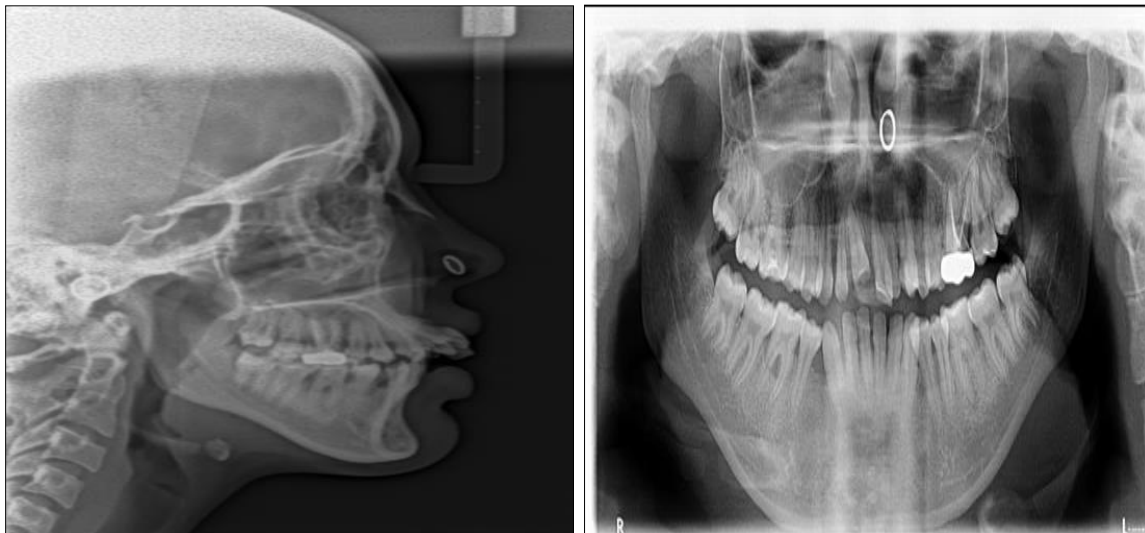
relationship with proclined upper and lower anteriors. (Table 1)

**Treatment objectives**

- To achieve Class I canine relation
- To upright upper and lower anteriors
- To close the spacing in upper and lower anteriors
- To close midline diastema in maxillary and mandibular arch
- To correct the crossbite i.r.t 25 wrt 35
- To achieve a balanced soft tissue profile



**Fig 2:** Pretreatment intra oral photographs



**Fig 3:** Pretreatment radiographs

**Table 1:** Radiographic evaluation pre and post treatment

Angles	Pre treatment	Post treatment
SNA	81°	80°
SNB	79°	79°
ANB	2°	1°
Interincisal angle	108°	111°
UI- SN	132°	112°
LI- MP	102°	95°
FMA	31°	29°
Sn- GoGn	35°	32°

**Treatment progress**

Initially, patient was referred to department of periodontic for oral prophylaxis. After that, the fixed orthodontic treatment started with bonding of upper and lower arch with 0.022” x 0.028” PEA appliance. (Fig. 4). Alignment was performed by sequential niti wires. Open Coil spring was placed for creating space for 34 in between 33 and 35 on 0.018” stainless steel wire with overlay 0.012” niti i.r.t. 34 (Fig. 5). After the alignment of the arches were done, finishing and detailing was carried out and bracket reposition was done. Finally 0.019” x 0.025” TMA wire was

placed in the upper arch and 0.018" SS with cuspid circle was placed in lower arch for closure of the space for missing

44. The patient was debonded after 19 months, followed by the retention protocol.



Fig 4: Bonding of upper and lower arches



Fig 5: 0.018" SS with open coil spring and overlay 0.012" NiTi

**Post Treatment**

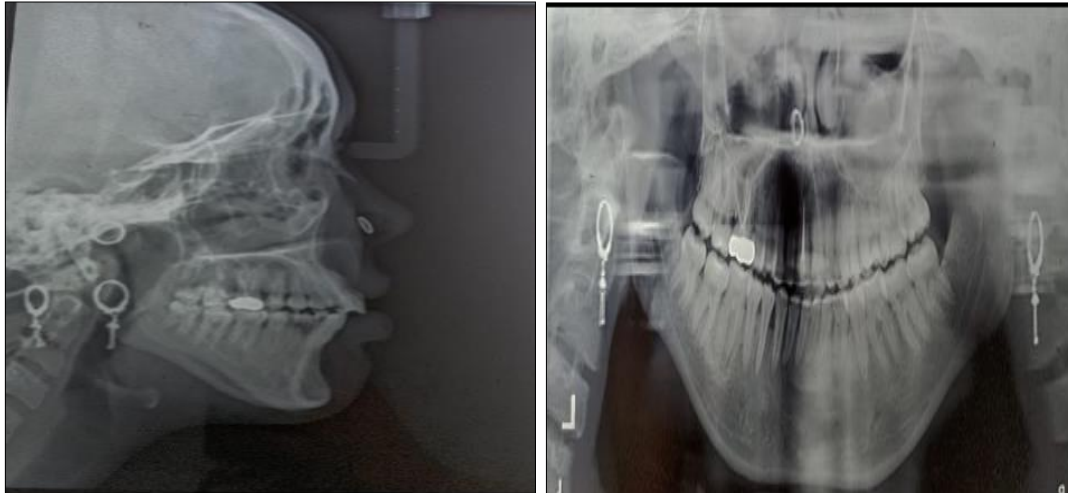
Treatment for this patient led to improved facial esthetics due to the decrease in lip protrusion. A Class I molar relationship was maintained with normal overjet and overbite, although a small amount of midline deviation still existed due to missing mandibular 1<sup>st</sup> premolar on right side. Post treatment radiograph shows regeneration of alveolar bone in mandibular molar region improving the anchorage and bone level also improved in the mandibular anterior region. Retraction of maxillary and mandibular anteriors was done, along with intrusion of the anterior teeth (Fig. 6a and 6b) (Table 1)

After debonding was done, it was followed by placement of fixed lingual retainers and removable Begg's retainer in both upper and lower arches.





**Fig 6a:** Post treatment extra oral and intra oral photographs



**Fig 6b:** Post treatment radiographs

### Discussion

Hart *et al* [5], indicate that the diagnosis of localized aggressive periodontitis requires attachment loss of at least 4 mm on at least two permanent first molars and incisors, with at least one being a first permanent molar. Additionally, no more than two other permanent teeth, excluding first permanent molars and incisors, should be affected. The case presented here included severe attachment loss in the first molar and incisor region especially in mandibular arch. The clinical manifestations of pathologic migration, such as proclination, diastema, rotation, extrusion, and drifting have been found in 30% to 50% of patients with moderate to severe periodontal disease [6]. In this patient, proclination and extrusion of both the maxillary and mandibular incisors was significant, with vertical bone loss in mandibular 1<sup>st</sup> molar region.

In patients with active periodontal disease, it is possible that orthodontic treatment may cause further progressive periodontal destruction [7].

The effectiveness of orthodontic treatment for patients with periodontal disease is enhanced by eliminating inflammatory factors, creating access for oral hygiene, and altering occlusal factors during tooth alignment. It has also been reported that gingiva or alveolar bone topography can be improved by altering the tooth inclination or extrusion. For this patient, esthetics were improved by retracting the anterior teeth. In addition, protection of the gingiva and mucosa was established by the normal lip closure. Eliminating maxillary and mandibular anterior crowding helped to improve bone support and secure access for plaque control.

It has been suggested the orthodontic correction of malocclusion would help periodontal stability and function

[8]. It is evident that the treatment has improved bony architecture and occlusal relationship. The prognosis is good; however, the challenge would be to maintain these favorable tissue responses through years to come.

However, the orthodontist should be cautious when applying orthodontic forces to teeth with severe periodontal disease and bone resorption. Lighter orthodontic forces should be applied to teeth with compromised bone support because they can move easily, and larger forces can negatively affect the periodontal membrane [9]. The interval of orthodontic force activation should also be longer, because remodeling the periodontal tissues will take longer than in patients with healthy periodontal tissues.

### Conclusion

This case report showed that orthodontic treatment can be useful in improving occlusal function and achieving long-term stability in periodontal tissue for generalized periodontitis. We have described an orthodontic approach for treating pathologic tooth migration with severe proclination of the anterior teeth, which included orthodontic therapy and periodontal therapy with a strictly supervised oral hygiene program. As a result, significant improvements in function, esthetics, and periodontal health were achieved.

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