



Case Report

Asymmetric Extraction - A Minimalistic Approach

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ABSTRACT

Male patient, at age 20, in good general health with no significant medical history. The main complaint was related to missing teeth in the upper arch and crowding especially in the lower arch. Tooth leveling and alignment were completed in 8 months by sequential changing of copper niti wires. At the end of this phase, the anterior overjet was increased, and the molar relationship was still Class I. Space was created between the central incisors and lateral incisors for the prosthetic tooth in the upper arch using open coil spring. Meanwhile, the lower extraction space of the lower incisors was closed by retraction. Space created for prosthetic crown and space closure in lower arch. Once the space was closed the overjet was increased to 2-3mm. And the upper missing central incisor was replaced with the prosthetic crown.

Keywords: Single incisor extraction; Reduced overjet; Missing upper incisors; Prosthetic rehabilitation

1 INTRODUCTION

A pleasant smile and proper alignment of anterior teeth are the main motivation for patients seeking orthodontic treatment. In permanent dentition, the mandibular anterior region is most susceptible to patient's dissatisfaction. It is the most common complaint, particularly among older adult patients due to greater exposure of mandibular teeth at smiling⁽¹⁾.

After the complete eruption of the permanent dentition, elimination of this arch-length imbalance can be achieved through the application of a comprehensive treatment plan that includes the following alternatives with respect to the aforementioned cases: (1) maintaining or recovering the missing incisor space followed by prosthetic reconstruction, (2) closing space and establishing Class II posterior relationships, and (3) closing space and extracting two mandibular teeth, either the premolars or lateral incisors, and establishing posterior relationships.⁽²⁾

2 HISTORY AND ETIOLOGY

Male patient, at age 20, in good general health with no significant medical history. The main complaint was related to missing teeth in the upper arch and crowding especially in the lower arch. A pretreatment extra-oral, intra-oral photographs (Figure 1). No esthetic complaints were reported. In functional occlusion analysis, it was found that the right and left lateral guides were performed by the first upper and lower premolars. Despite no functional guides being present, there were no signs or symptoms of temporomandibular disorders. No orthodontic intervention had been performed before. Pre treatment cephalogram and a panoramic radiograph (Figures 2 and 3) were taken before treatment.

3 DIAGNOSIS

Regarding facial characteristics, the following features were present: A mesocephalic pattern, symmetrical face, normal nasolabial angle, with a straight profile. Angle Class I mal-



Fig. 1: Pre-treatment extra oral, and Pre-treatment intra oral

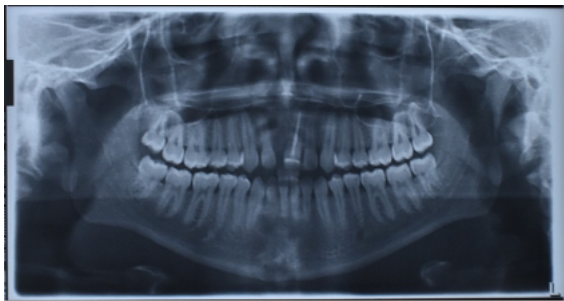


Fig. 2: Pre-treatment OPG



Fig. 3: Pre-treatment lateral Cephalogram

occlusion, with severe lower anterior crowding. A reduced overbite was present. The upper midline was inclined.

3.1 Treatment objectives

Orthodontic treatment aimed to eliminate the anterior dental discrepancy, correcting the crowding of upper and lower incisors, aligning and leveling the teeth without jeopardizing the facial profile; establishing esthetically favorable and functionally effective overjet and overbite, properly positioning the teeth on their apical bases, and contributing to improve periodontal health. The extraction of premolars could result in flattening of the facial profile, aggravated by facial changes due to age; however, the treatment without extractions would increase the lack of lip seal, and contribute to the worsening of gingival recession and a greater tendency to relapse.

3.2 Treatment progress

Treatment began with banding the first molars and bonding all other teeth (0.022 3 0.028-in edgewise appliance). Tooth leveling and alignment were completed in 8 months by sequential changing of copper niti wires. At the end of this phase, the anterior overjet was increased, and the molar relationship was still Class I. Space was created between the central incisors and lateral incisors for the prosthetic tooth in the upper arch using open coil spring. Meanwhile the lower extraction space of the lower incisors was closed by retraction. Space created for prosthetic crown and space closure in lower arch (Figure 4). Once the space was closed the overjet was increased to 2-3mm. And the upper missing central incisor was replaced with the prosthetic crown [Figure 5]. Post treatment lateral cephalogram and orthopantomogram (OPG) (Figures 6 and 7). Pre and Post treatment intra-oral and extra-oral photographs (Figures 8 and 9). The cephalometric analysis (Figure 10).



Fig. 4: Mid-treatment after debonding

Retention protocol: The Planned retention consists of upper and lower removable wraparound retainers, and a 3x3 fixed lingual retainer on lower incisors and canines.



Fig. 5: Post-treatment

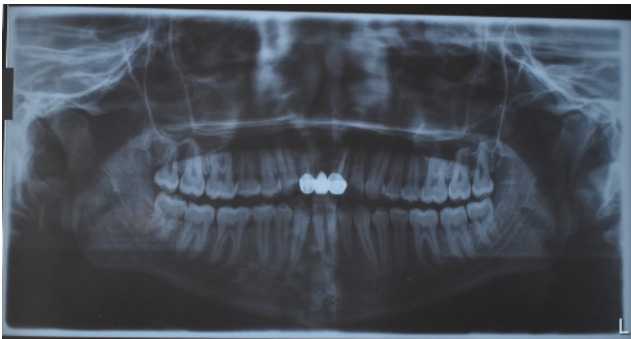


Fig. 6: Post-treatment OPG



Fig. 7: Post-treatment lateral Cephalogram

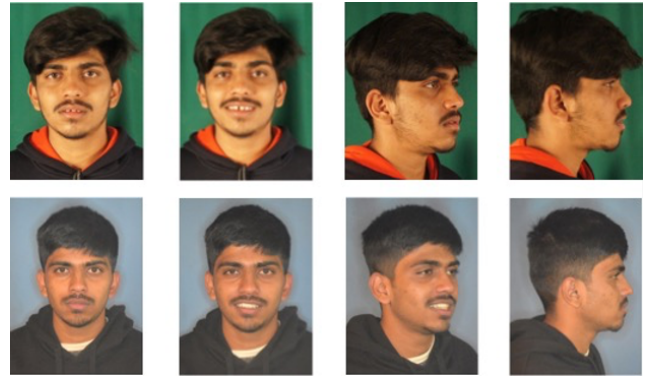


Fig. 8: Pre-treatment extra oral and Post-treatment extra oral



Fig. 9: Pre & post treatment of extra oral

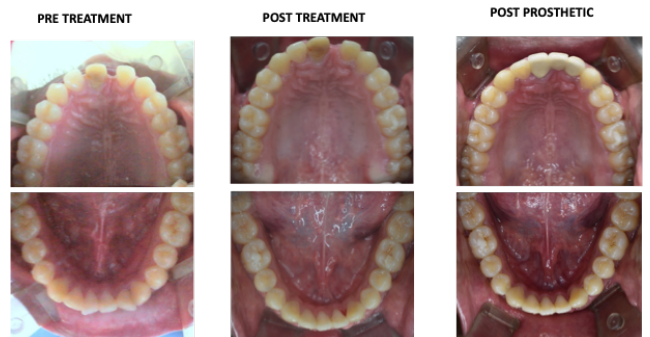


Fig. 10: Pre & post treatment of intra oral

4 TREATMENT RESULTS

The teeth were well aligned and leveled after treatment. Occlusal contacts between the maxillary and mandibular teeth were achieved, although the interdigitation was not good. The patient's harmonized profile and facial esthetics were maintained (Figures 6 and 7).

The posttreatment cephalometric analysis and superimposition showed that the skeletal discrepancy between the maxilla and the mandible remained unchanged. The

maxillary and mandibular incisors were labially proclined. The mandibular plane angle was not affected by the treatment.

5 DISCUSSION

Despite the difficulties or limitations that planning of cases with incisor extraction may result during orthodontic treatment, provided properly conducted and evaluated considering the particularities of each case, it can be stated that the lower incisor extraction contributes effectively to the treatment of certain mal- occlusions, seeking excellence in orthodontic treatment outcomes (maximum function, esthetics, and stability). The patient's satisfaction with having his main complaint resolved is reflected also in increased self-esteem and gain of quality of life benefits provided by orthodontics in the aspect of overall health.⁽³⁾

Previous articles by Valinoti, Kokich and Shapiro, and RiedeP have described the indications, advantages, and limitations of mandibular incisor extraction.⁽⁴⁾

Based on the results of this study, it is reasonable to conclude that extracting the patient's mandibular incisor contributed favorably to correct mandibular dental crowding which was the patient's chief complaint. The minor change caused to mandibular intercanine width can be considered a factor that contributed to increased long-term alignment stability.⁽⁵⁾

It is well-known that a Class I canine relationship is important for functional occlusion. In this situation, a canine-protected occlusion became a premolar-protected occlusion during the mandibular lateral or working excursions. For the mandible, the first premolar frequently resembles the canine in every aspect important to substitution: length of crown and root, buccal cusp height, and mesiodistal diameter. Moyers stated that premolars possess periodontal proprioceptor impulses to the same degree as do the canines.⁽⁶⁾

6 CONCLUSION

Limited conclusions can be reached about the indications and the effects of extraction of lower incisors for orthodontic reasons, as all the articles found were of descriptive nature

(case reports or case series) which do not allow for strong evidence-based recommendations.

There is a low level of evidence that mandibular incisor extractions can be effectively used as a suitable treatment option or alternative extraction choice in the resolution of crowding as well as intermaxillary malocclusion in carefully selected cases.

Mild-to-moderate class III malocclusion, an edge-to-edge anterior occlusion or anterior crossbite, mild anterior mandibular tooth size excess, and minimal overbite or open bite tendencies are the clinical situations most frequently treated with this unique extraction choice.

On the other hand, clinicians should be careful to avoid poor outcomes such as gingival recession, open interproximal gingival embrasures, increased overjet, and overbite.⁽⁷⁾

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