

CASE REPORT

# Orthodontic rehabilitation of a Class I malocclusion with moderate crowding: A case report

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## Abstract

Crowding is the common feature of Angle Class I malocclusion. The analysis of the etiology of Class I malocclusion is an essential step for the diagnosis, planning, treatment, and prognosis of any dental treatment that involves esthetic goals. This is a case report of a 27-year-old woman with moderate crowding in the upper and lower arches due to the presence of an over-retained primary canine. This case report was able to assess clinical and radiological methods in integrating orthodontic treatment on Class I Crowding Malocclusion. This clinical report described orthodontic rehabilitation with the use of metal conventional fixed brackets on upper and lower dentitions. The case relates to the use of several disciplines including restorative, oral surgery, and orthodontics. The combination of these treatments allows the patient to be rehabilitated orally and makes the bonding of orthodontics simpler and more effective.

**Keywords** orthodontics, orthodontic braces, malocclusion, class I

## 1 | Introduction

Worldwide, in both mixed and permanent dentitions, Angle Class I malocclusion is more prevalent than Class II, and the least prevalent is Class

III.<sup>1</sup> The most common occlusal feature of Class I malocclusion is crowding. Crowded and irregular teeth are the most common complication seen in adults. The patient's age, the affected

jaw, and the degree of crowding all influence the treatment option. Orthodontic treatment planning requires skill and expertise with considerable practice variations.<sup>2</sup> The primary concern for patients seeking orthodontic rehabilitation is for esthetic purposes. However, in achieving the result wanted, full mouth rehabilitation must be observed to make the orthodontic treatment effective. Class I malocclusion shows the highest prevalence compared to other malocclusions in any population worldwide. The treatment was performed using a fixed orthodontic appliance upon extraction of the over-retained primary canine for occlusal alignment of both arches.

The study aimed to provide and expand the knowledge of the future generations to be able to provide a service that is a less invasive and simple approach in treating Class I crowding malocclusion in order to retain the patient's confidence in having a beautiful smile.

## 2| Case presentation section

### 2.1. Chief complaint

A 27-year-old female patient presented to the dental clinic with the chief complaint of misaligned teeth. She stated in verbatim "Ga hiwi hiwi



Figure 1. Pre-treatment extraoral photographs



ako ngipon, ang akong duha ka ngipon sa taas ug usa ka ngipon sa ubos ni pa luyo siya" (My teeth are not aligned. My two upper teeth and one lower tooth are behind the adjacent teeth).

### 2.2. Medical & dental history

Upon patient interview, no remarkable medical findings were found in her medical history.

### 2.3. Dental history

There was no history of previous dental treatments according to the patient. Intraoral examination revealed Angle Class I crowding malocclusion (Figure 2-3). Crowding is classified as moderate crowding on her upper and lower arches. Several carious lesions and an over-retained primary maxillary

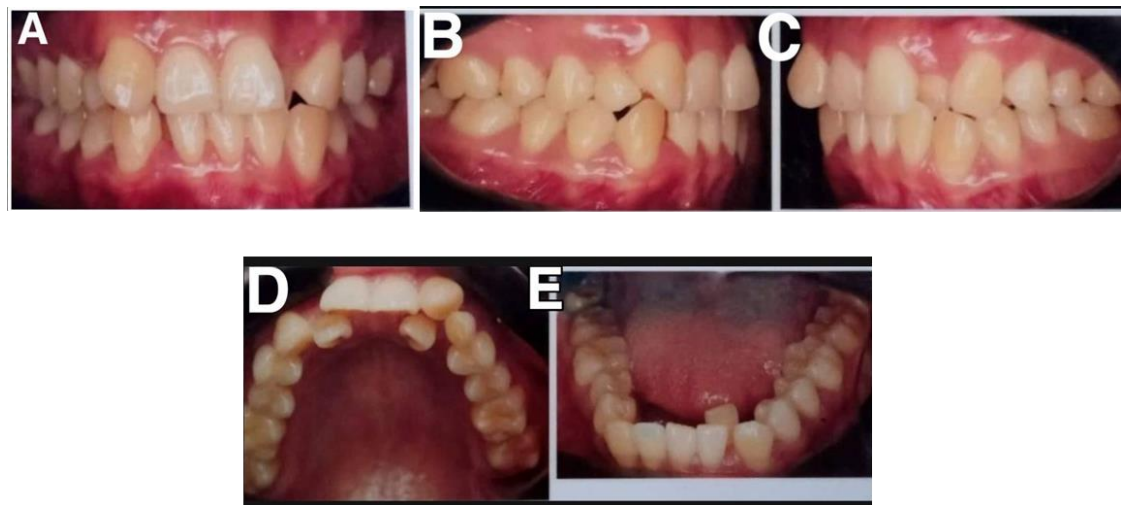


Figure 2. Pre-treatment intraoral photographs. (A) anterior view. (B-C), lateral view. Mild crowding due to the presence of tooth 63. (D), occlusal view (E).

canine were present. Other periodontium and dentition were in good health. Impaction of both maxillary third molars was visible in the panoramic radiograph (Supplementary Figure 1).



Figure 3. maxillary cast showing crowding and presence of deciduous canine #63.

#### 2.4. Diagnosis

Upon examination, it was observed that patient had Class I crowding malocclusion due to over-retained primary canine.

#### 2.5. Prognosis

Occlusal alignment of the teeth was achieved during the entire course of treatment. The extraction of the maxillary left canine aided to the correction of Class 1 crowding. Good alignment of the teeth was achieved because of the dentist's expertise therefore having a good prognosis. In addition, the patient's attendance in attending to her dental appointments paved way in achieving a good occlusion.

#### 2.6. Treatment

Based on the information gathered from the initial examination, radiographs, and diagnosis, a comprehensive treatment plan that caters to the patient's esthetic needs and for correction of occlusal harmony is formulated. Oral Prophylaxis and composite restoration on mandibular

right posterior teeth were done during the first phase of treatment. A secondary phase followed involving the extraction of deciduous left maxillary canine before orthodontic treatment. The objectives of the treatment plan were to correct the misalignment of teeth. The patient accepted the treatment plan with informed consent. In the first 3 months of treatment, an Open Coil spring was applied to give a mechanism of pushing the teeth away to give space for the proper alignment of the crowded tooth and after which proceed to monthly adjustments. By July 14, 2019 .012 Niti wire to help in severe crowding followed by the .016 Niti wire when teeth are nearly straight. .016 x .022 for wire progression and .016 x .025 mechanics stage or space closure of teeth on upper and lower arches of the teeth.



Figure 4. Post treatment Hawley's Retainer

After two years and one month of orthodontic treatment, there was good prognosis in the alignment of teeth on the dental arch. The treatment was completed on June 6, 2021 with Hawley's retainer as the final orthodontic appliance used for both arches to maintain and prevent undesirable movement of teeth. (Figure 4).

### 3 | Discussion

Aesthetic alterations can have an impact on the quality of life and how one perceives oneself. In this case of a 27-year-old female, the patient presented moderate crowding with three anterior teeth overlapping in the upper and lower jaw. Orthodontic treatment was formulated to correct the malocclusion. Pre-orthodontic treatments consist of oral prophylaxis and the restoration of carious teeth. This is to ensure a good oral environment before orthodontic treatment since orthodontic appliances may influence the growth of oral microbiota such as *Streptococcus mutans* and *Lactobacillus* spp. which are responsible for dental caries formation.<sup>3</sup>

In this case, the permanent canines are typically positioned lingually different from the other teeth in the maxilla. One method that alleviated crowding is through elective extraction of teeth. The second phase

of treatment focused on extracting the deciduous left maxillary canine to alleviate the crowding of teeth. The most common persistent primary teeth on the dental arch were mandibular primary second molars (60.8 %) followed by maxillary primary canines (17.8 %).<sup>4</sup> Primary teeth are typically extracted when crowding arises and an extraction is required to straighten the arch orthodontically. Congenital absence of the primary teeth's successors was the most frequent cause of persistence, followed by impaction of the successor's teeth.

Retention is required after an active phase of orthodontic treatment because there is a tendency for recurrence. Hawley retainers are used for space maintenance in this case. By wearing the retainers, teeth will maintain their corrected position. Many types of retainers are designed particularly for retention, fixed retainer, and removable retainer. Nowadays, Hawley retainer (HR) and vacuum-formed retainer (VFR) are the most common clinical removable retainer.<sup>5</sup>

## 4| Conclusions

The choice of an effective treatment plan and the patient's willingness to attend every appointment is necessary for orthodontic excellence. The present case provides evidence that the use of metal conventional fixed

orthodontic appliances treated class 1 crowding malocclusion and improved the facial profile and occlusion of the patient. There was no extraction of sound teeth embarked, except for the primary canine. The patient's chief complaint was relieved after the treatment and is satisfied with the result.

### **Institutional Review Board Statement**

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of Southwestern University PHINMA School of dentistry.

### **Informed Consent Statement**

Informed consent was obtained from the patient and the attending dentist. All methods have been exhausted to maintain the anonymity of the patient.

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### **Conflicts of Interest**

The authors declare no conflict of interest.

## References

1. Maged Sultan Alhammadi., Esam Halboub., Mona Salah Fayed., Amr Labib., Chrestina El-Saaidi. Global distribution of malocclusion traits: A systematic review. Published online 2018
2. Ongelina, S., & Narmada, I. B. Management of dento-maxillary disharmony in angle class I malocclusion with anterior crowding, midline shifting, and deep bite: A case report. Published online 2019
3. Nada NA, Zenab NRY, Malik I. Differences of patients with Angle class I type 1 profile before and after treated with removable orthodontic appliance. Padjadjaran Journal of Dentistry. 2017;29(1). doi:10.24198/pjd.vol29no1.11589
4. Ali B, Shaikh A FM. Factors affecting treatment for Class I malocclusions. Published online 2018.
5. Eduardo Bernabe CFM. Dental morphology and crowding. A multivariate approach. Angle Orthod. 2006;76(1)(20-5).



Supplementary Figure 1. Panoramic radiograph



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