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**2<sup>nd</sup>**  
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**ORTHODONTIC TREATMENT IN UPPER ARCH DDM WITH  
MANDIBULAR CROWDING CAUSED BY UNFINISHED  
REMOVABLE ORTHODONTIC TREATMENT  
(CASE REPORT)**

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**ABSTRACT**

**Background :** Disharmony dento maxillary a disproportion between teeth size and the arch. One of clinical appearance that can be seen is crowding with several signs. Which can be seen in this patient upper arch, with mutilation in mandibular first premolar causing increasing in overbite, overjet and moderate crowding in mandibular.

**Purpose :** The purpose of this treatment is to eliminate crowding, reduce overjet, overbite and establish good relationship between maxilla and mandibula.

**Case :** An Indonesia-Javanese female 25 years old. Patient presented dento-skeletal class I malocclusion with severe crowding at maxilla and moderate crowding in mandibula. Permanent first premolar mutilation at mandibula in both sides. With increasing overjet and overbite.

**Case Management :** Edgewise appliances was bonded, extraction maxillary first premolar, odontectomy mandibular third molar, canine retraction, maxillary anterior retraction. Overbite and overjet correction and mandibular leveling unraveling.

**Result :** In the end of treatment crowding was eliminate, good esthetic and function was established.

**Key words :** Orthodontic treatment, DDM, mandibular first premolar mutilation.



## INTRODUCTION

Disharmony dento maxillar known as DDM is a disproportion between teeth size and jaw, in this case is the arch. Etiology of DDM is hereditary factor.<sup>1</sup> Clinical appearance that can be seen in this patient are severe crowding in upper arch that match with DDM symptom. Eventhough there can be found crowding in DDM, but not every crowding caused by DDM. DDM clinical signs at anterior regio in mixed dentition phase are 1) By the time, permanent central insisive will erupt, it will resorp deciduous central and lateral insisive root at the same time. It will cause premature loss of deciduous lateral insisive, 2) Permanent central insisive erupt in normal position, because it has enough space, 3) By the time permanent lateral insisive will erupt, there will be 2 posibility are permanent lateral insisive resorp deciduous canine root causing premature loss of deciduous canine and permanent lateral insisive erupt in normal position, then permanent canine will erupt outside the arch (ektostem) because it doesn't has enough space to erupt and permanent lateral insisive doesn't resorp deciduous canine root, instance it will erupt in palatal exactly where the bud will erupt. Then permanent canine erupt normally at the arch because it has enough space.<sup>1</sup>

In severe crowding space will be required to eliminate that. At permanent dentition extraction almost always required to provide enough space. The extraction choice is first premolar because it provide enough space in severely crowded patients (arch lenght discrepancy > 10mm).<sup>2</sup>

From the anamnesa, patient thought that mandibular first premolar mutilation were revealed for treatment using removable appliance, but the treatment it self never been finished. Treatment succesfull with removable appliance not only depend with patient cooperatif to use the appliances, but also operator ability to design and make an appliance that can be tolerated by patient. The design should be simple, not thick, not complex or complicated that may interfere with speech and eating. If this circumtances fulfilled, can be expected patients would used the appliances continously. Removable appliance used for treatment of mild malocclusion. For maximum result view things that must be noticed are : selection of cases, treatment planning, appliances design, and treatment management.<sup>3</sup> Cases that can be treat using removable appliance are cases that require tipping tooth movement.<sup>4</sup> It necessary to emphasized that removable appliance is not planned for comprehensive treatment. Although widely utilized in the past as the sole appliance to treat malocclusion, with the increasing availability and acceptance of fixed appliance have become more

apparent. As a result the role of removable appliance has changed and its becoming more widely used as an adjunct to fix appliances treatment.<sup>3,4</sup>

## CASE

### Case History

An Indonesia-Javanese female 25 years old patient, came to orthodontia specialistic programme clinic faculty of dentistry Airlangga University. The patient have been in orthodontic treatment using removable appliance but never been finished. Extra oral photographs revealed facial symmetry and straight facial profile. Intra oral examination revealed an end to end caninus relation and molar relation in class III, mutilation of mandibular first premolar. Severe crowding at maxilla and moderate crowding in mandibula, with increasing overjet (5mm) and overbite (3mm) and slight mandibular midline shifting (1mm to the left) (Fig. 1 and 2).



**Fig 1. Extraoral photograph before orthodontic treatment**



**Fig 2. Intraoral photograph before orthodontic treatment**

In panoramic examination obtained that there mutilation in mandibular first premolar (34 and 44)

### **Cephalometric Analysis**

Cephalometric analysis revealed patient with orthognatic facial type and straight profile ( $\angle$ FH-NP 81°,  $\angle$ NAP 7°). With maxilla and mandibula relationship toward cranium base showing class I skeletal pattern ( $\angle$ SNA 75°,  $\angle$ SNB 72°,  $\angle$ ANB 3°).

### **DIAGNOSIS AND TREATMENT PLANNING**

The patient was diagnosed to have class I Angle malocclusion with severe crowding at maxilla and moderate crowding in mandibula, with increasing overjet (5mm) and overbite (3mm) and slight mandibular midline shifting (1mm to the left). The objectives of the orthodontic treatment were eliminate crowding in maxilla and mandibula, and to establish stable occlusion. Level and align the arches, obtain normal overjet and overbite, and to improve patient facial esthetic.

### **Treatment Phase**

The lower 3rd molars (38 and 48) were extracted to eliminate posterior discrepancy, in maxilla first premolars (14 dan 24) were extracted to eliminate severe crowding in anterior. An 0.018 Edgewise bracket prescription were inserted in upper arch (15 until 25) and lower arch (35 until 45) with molar band and welding tube in 2nd molars (17,27,37,47) and molar band and welding bracket in 1st molars (16,26,36,46). Levelling and aligning start with SS 0.012 in upper arch ,in lower arch using SS 0.012 with multiloop. Followed by SS 0.014 partial retraction of upper arch C using elastic chain were done in this stage and continued C retraction with SS 0.016 wire using elastic chain. When there is enough space for 12 and 22, then both of upper arch lateral insisive were pull to the arch using SS 0.016 with loop. Upper arch anterior retraction were done using SS rectangular 0.016x0.022 inch with loop mechanism. Ideal arch for upper and lower arch using SS rectangular 0.017x0.025. With pasif phase for 2 months long

### **Treatment Result**

After 2 years 8 months orthodontic treatment. The orthodontic treatment result was able to eliminate crowded in upper and lower arch, reduces overjet and overbite. Caninus



relation from end to end become class I relation, and molar become class I relation. Patient facial esthetic become better than before.



**Fig 3. Extraoral photograph after treatment.**



**Fig 4. Intraoral photograph after treatment**

## **DISCUSSION**

In mixed dentition phase the treatment of choice to treat DDM is serial extraction<sup>4</sup>, but in the permanent phase severe crowding case like this would require space to eliminate crowding by extract permanent teeth. The extraction choice would be first premolar because it provide enough space in severely crowded patient.<sup>2</sup> For extraction space closing in this case, canine were retract first into premolar extraction sites, then followed by four insisive retraction. In patient with severe crowding of anterior teeth, it is necessary to retract the canines into premolar extraction sites to gain enough space to align the incisors.<sup>2</sup> Sliding the canines produces more stress on the posterior anchorage, so critical anchorage is an indication.<sup>2</sup> Critical anchorage are category describes the critical maintance of the posterior tooth position. Seventy-five percent or more of the extraction space is needed for anterior

retraction.<sup>5</sup> To get this type of anchorage in this case it's used double molar band in upper and lower molars, to reduce stress on posterior anchorage.

Mutilation of mandibular first premolars caused shortening of the arch, increasing overjet and overbite. Because mutilation can cause arch length to shorten as the incisors teeth drift distally and lingually.<sup>2</sup> There is no extraction in mandibular because of first premolars mutilation, only extraction of impacted 3rd molars. Levelling and aligning using multiloop were done to correct dental malpositions, without space left in mandibular and put all the teeth well aligned. According Graber the most frequently used treatment sequence in the space utilization phase in low arch as follows : correction of rotations and dental malpositions, complete levelling of curve of spee, closure of residual space and detailing of the arch and occlusion.<sup>6</sup>

## **CONCLUSION**

In removable orthodontic treatment it is important to consider patient cooperation and operator ability to make design for maximal result of the treatment. With severe crowding like this case, we should consider type anchorage should be used to avoid anchorage drift to extraction sites, that will cause lack of space to eliminate crowding.

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