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Extraction Premolar Unilateral to Correct Canine Class II Division I Subdivision - A Case Report

Andi Iffah Syahamah AZ[1], Rasdiana Bakri[1], Suhesti Suronoto[1], Eddy Heriyanto Habar[2], Ardiansyah S. Pawinru[2] , Donald R. Nahusona[2]

[1]Orthodontics Specialist Study Program, Faculty of Dentistry, Hasanuddin University, Makassar-Indonesia
[2]Department of Orthodontics, Faculty of Dentistry, Hasanuddin University, Makassar-Indonesia

Abstract

Objective: The purpose is to correct canine class II division 1 subdivision by extraction premolar unilateral. **Case Description:** A 22-years-old female came to the Hasanuddin University Dental Hospital Orthodontic Clinic with complaints about her crowded teeth and protrusion. Figure 1 showed pre-treatment photograph of extra and intraoral. On extraoral examination, patient had a convex profile, competent lips, and no TMJ abnormalities. On intraoral examination, patient had positive curve of spee, crowded teeth, midline of upper arch shifted 1 mm to the left and deep palate. The patient was treated with 0.022-in Standard Edgewise prescription bracket with extraction right upper premolar. After 36 months of treatment, canine right relationship become Class I, the midline of upper and lower in one line, overjet 3 mm and overbite 1.5 mm. **Conclusion:** The canine Class I relationship can be achieved by extraction unilateral premolar. The patient's occlusion and smile aesthetics were significantly improved with normal and stable occlusion between maxillary and mandibular arch.

Keywords: Unilateral extraction, Class II division I subdivision

INTRODUCTION

Class II subdivision malocclusion patients have Class I characteristics on one side and Class II characteristics on the other.[1] Class II subdivision dental relationships occur in almost 50% of patients, while Class II malocclusions affect about 42% of all individuals.[2] A premature unilateral loss of a permanent first mandibular molar or the distal eruption of the permanent mandibular first molar in relation to the permanent first maxillary molar on the Class II side are the main causes of unilateral Class II malocclusion, according to other studies.[3]

Clinicians have long faced treatment challenges when dealing with patients who have Class II subdivision malocclusions.[4] One issue that an orthodontist deals with on a daily basis is division malocclusion.

Because the subdivision side has a propensity to relapse, these cases provide challenges not only during orthodontic treatment but also in post-retention stability.[5]

DIAGNOSIS AND ETIOLOGY

A 22-years-old female came to the Hasanuddin University Dental Hospital Orthodontic Clinic with complaints about her crowded teeth and protrusion.

Figure 1 showed pre-treatment photograph of extra and intraoral. On extraoral examination, patient had a convex profile, competent lips, and no TMJ abnormalities. On intraoral examination, patient had positive curve of spee, crowded teeth, midline of upper arch shifted 1 mm to the left and deep palate.

Model study analysis showed an overbite and overjet are 5 mm and 3 mm. Based on arch length discrepancy (ALD) analysis revealed discrepancy of -6 mm in the maxilla and +3 mm in the mandible. Tooth size discrepancy (Bolton) analysis obtained normal values, while Pont analysis showed dental arch distraction in the premolar and molar regions.

Panoramic radiographs showed impacted all of the third molars and missing right lower molar in Figure Lateral cephalogram analysis showed Class II skeletal malocclusion (ANB 5º) with normal maxilla (SNA 82º) and retrognatic mandible (SNB 77º) in Table 1. Inclination of maxillary and mandible incisor are both proclination, long lower face height, position of upper lip 5.5 mm in front of E line and lower lip 6 mm in front of E line.2..

TREATMENT OBJECTIVES

In this case orthodontic treatment was performed by extraction unilateral premolar maxilla to achieve class I canine relation on the right side.

TREATMENT ALTERNATIVES

There are two treatment options offered to patients. First, extraction two premolars maxilla and one premolar mandible to correct the canine relationship on the right and to improve the protrusion. The alternative treatment is extraction only one premolar on the right maxilla to get canine Class I relationship. Patient choose the second choice cause of the economic issue.

TREATMENT PROGRESS

The patient was treated with 0.022-in Standard Edgewise prescription bracket with extraction right up per premolar. After 36 months of treatment, canine right relationship become Class I, the midline of upper and lower in one line, overjet 3 mm and overbite 1.5 mm (Figure 3).

Figure 4 showed panoramic and cephalometric post treatment. The tooth missing on the first molar right lower will be replaced by prothesis. There are no big changes on the cephalometric analysis.

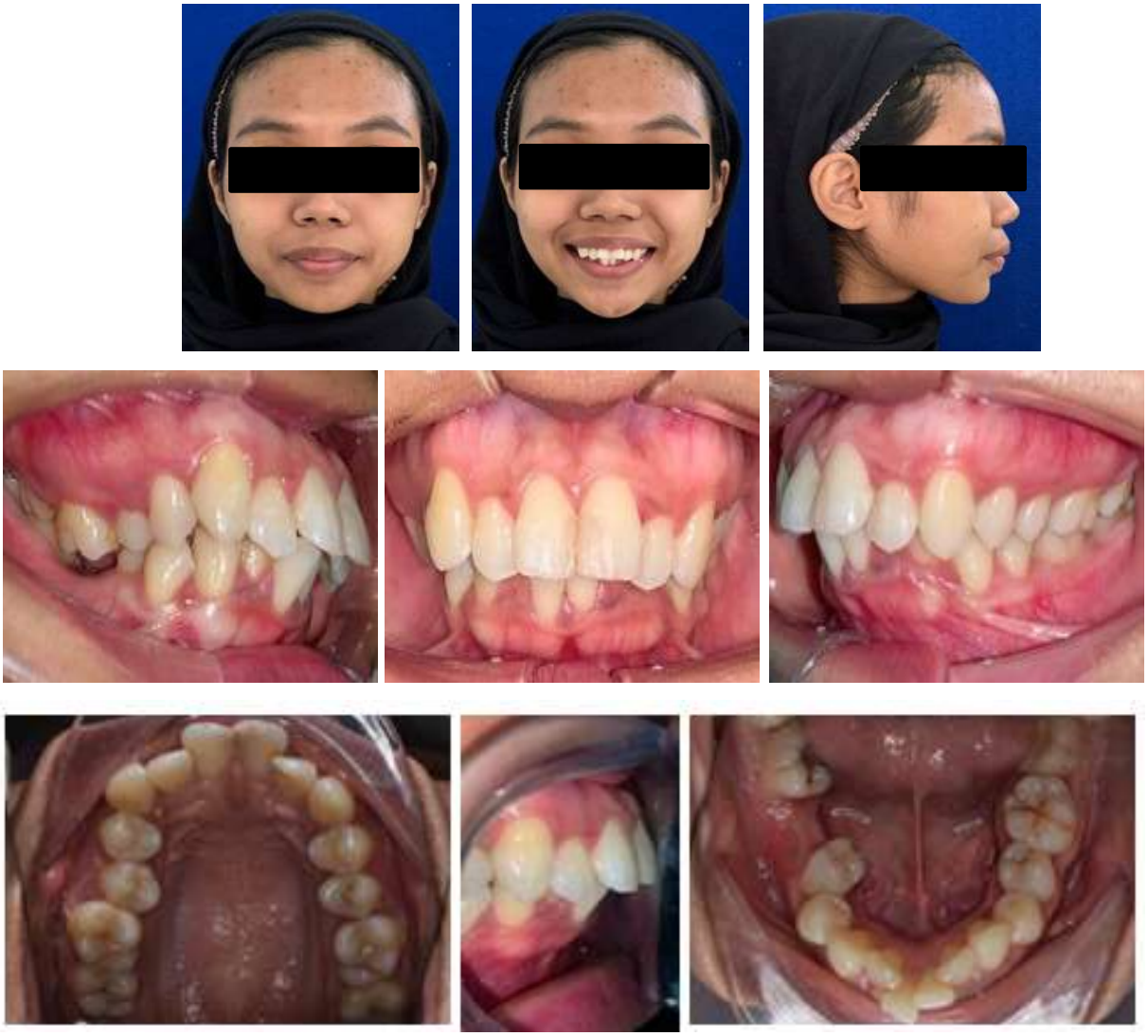

Fig. 1. Pre treatment facial and intraoral photograph

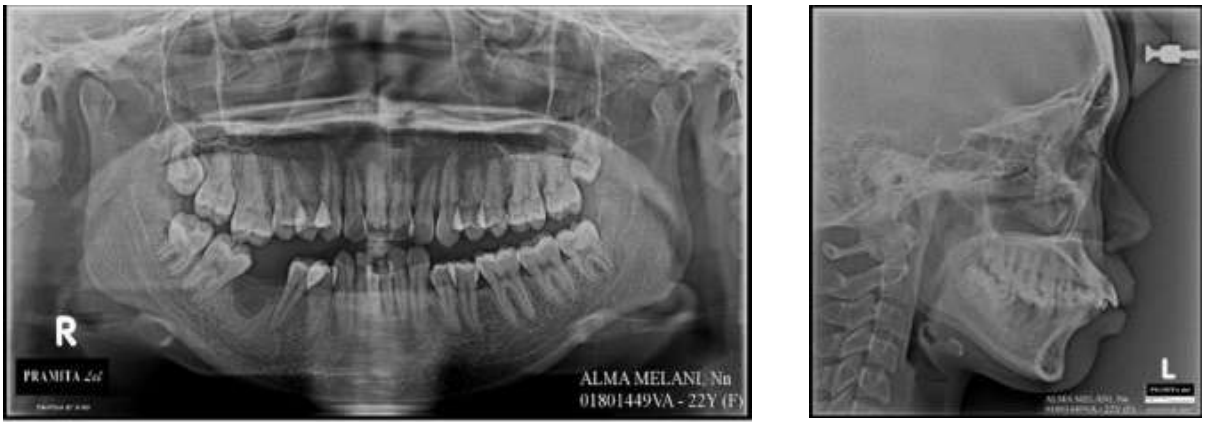

Fig. 2. Pre treatment radiographs: A. panoramic radiograph; B. lateral cephalogram

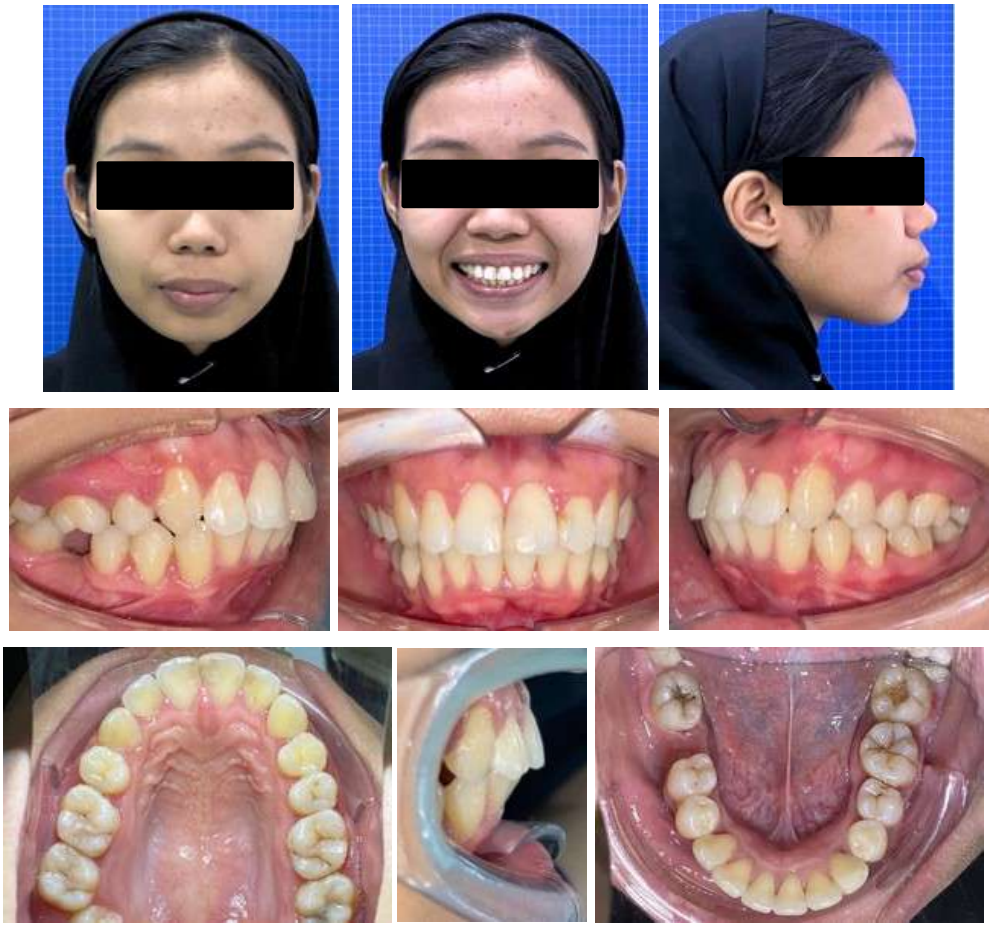

Fig. 3. Post treatment facial and intraoral photograph

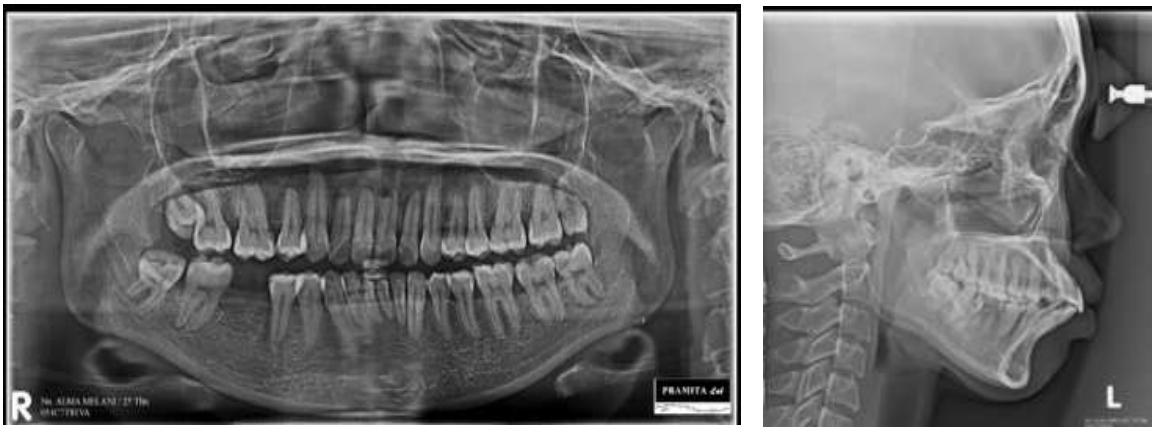

Fig. 4.Post treatment radiographs: A. panoramic radiograph; B. lateral cephalogram

Table 1. Cephalometric analysis pre and post treatment

Parameter	*Norm (mean ± SD)*	*Pre*	*Post*
Horizontal skeletal			
SNA (˚)	82± 2	82	82
SNB (˚)	80± 2	7	77
ANB (˚)	2± 2	5	5
Dental Analysis			
U1-NA (mm)	4± 2	11	10
U1-NA (˚)	22± 2	33	30
L1-NB (mm)	4± 2	11	15
L1-NB (˚)	25± 2	36	40
Interincisal (˚)	135± 10	106	117
E-Line to upper lip (mm)	-1± 2	5.5	4
E-Line to lower lip (mm)	0± 2	6	7
Nasolabial (˚)	102± 8	89	90

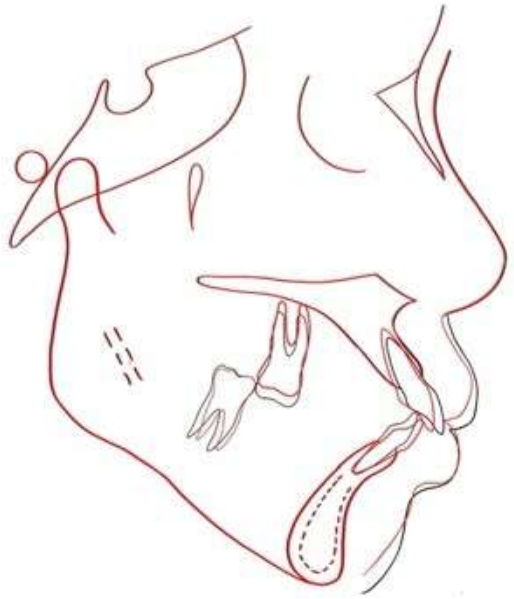

Fig. 5. Cephalometric superimposition: *black line*, pre-treatment; *red line*, post treatment

TREATMENT RESULT

When the maxillary incisors are inclined towards the buccal region and the maxillary molar is positioned mesially with respect to the mandibular first molar, this condition is known as class II division 1. Patients may have deep palates, atretic upper arches, increased overjet, and dry, parted lips, which can lead to facial muscle discord.[6]

DISCUSSION

Treatment planning and implementation are always difficult in class II subdivision situations. There are several benefits to moving on with the single premolar extraction in the following case, including a favourable midline deviation towards the class II side and an aesthetic profile. One premolar extraction will exacerbate the problem if the case showed a more convex profile, which is typical of class II situations. Regarding symmetry, the treatment outcome will be favourable due to the divergence towards class I.[7]

Extractions may be symmetric (4 premolar extraction) or differential (asymmetric-3 premolar extraction), depending on the patient's profile. In contrast, a pleasing profile does not support extractions. Class II, diagonal, and asymmetric elastics (Class II on the side of malocclusion and Class III on the normal side) or spring correctors are all included in the non-extraction treatment plan. [8]

Compared to the four premolar extraction plan, the three bicuspid extraction method exhibits a propensity for better repair of the antero-posterior discrepancy of posterior segments and a somewhat higher treatment success rate in correcting the midline deviation.[8]

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CONCLUSIONS

The canine Class I relationship can be achieved by extraction unilateral premolar. The patient's occlusion and smile aesthetics were significantly improved with normal and stable occlusion between maxillary and mandibular arch.

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