

Case report

Orthodontic management of compromised first permanent molars with bilateral posterior crossbite, severe crowding and impacted maxillary canines.

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Abstract

Background: A unique clinical challenge presents when dealing with a compromised first permanent molars with bilateral posterior crossbite, severe crowding and impacted maxillary canines with skeletal class II base malocclusion patient. **Case presentation:** 14-year-old female patient had dental Class II skeletally, complicated with increase overjet, badly destructed permanent mandibular 1st molars constricted maxillary arch. Extraction of 1st molars followed by expansion have been planned to relieve crowding. Extraction of 1st molars in this time (furcation of 3rd molars start to develop) help in replacement by 2nd molars. In the progression of treatment,

Conclusion: A well-balanced and esthetic occlusion by edge wise orthodontic treatment has been archived in this case.

Keywords: Malocclusion; posterior crossbite; compromised first permanent molar; severe crowding; impacted maxillary canines; skeletal class II.

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Introduction

Malocclusion complicated with combination of different problems are challenging to manage¹⁻³. First molars of permanent dentition have been stated to be the caries prone tooth. It is not logic to extract healthy premolars rather than compromised molars for the treatment of crowding or dental protrusion, since badly destructed teeth will need to be extracted later in future. This decision was difficult because the cases of extracted 1st molars usually require complex orthodontic mechanics as well as questionable prognosis. Presence of impacted canines in maxilla will make the case more difficult⁴⁻⁶ and anchorage more critical.

Case Presentation

This is 14-year-old female referred from pedodontist after extraction of mandibular right primary 1st and 2nd molars, maxillary right primary canine, and maxillary and mandibular left primary canines. She presented with class II div 1 incisor relationship on skeletal class II base with mandibular deficiency

and increase vertical proportion. Upper anterior teeth are overlapped each other. She presented with badly destructed right permanent 1st molars (upper and lower) and lower left permanent 1st molar. She has bilateral crossbite. There was severe crowding in both arches with impacted maxillary canines in both sides. In occlusion, upper laterals were in lingual crossbite, lingually positioned mandibular lateral incisors, 5mm overjet with proclined upper and lower incisors.

Treatment plan

Treatment involved extraction of maxillary and mandibular 1st molars, expansion of maxilla with rapid maxillary expansion and surgical exposure of maxillary canines. A preadjusted edgewise appliance (0.022"X0.028") with MBT prescription was used to achieve the results.

Treatment Progress

Treatment started with fitting molar bands and made an impression for Hyrax expander in maxillary arch and cementation of lower molar bands. After

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that, cementation of upper Hyrax and activation of expansion was accomplished with 2-quarter turns (0.5 mm) per day until the anticipated overexpansion was achieved, evaluated by the diastema opening and posterior transverse relationship on clinical situation. There was a clinically notable opening of the diastema between the maxillary central incisors after 3 weeks. The expander remains as retainer for three months.

After 4 months, removal of the expander and transpalatal arch (TPA) in maxillary arch to reinforce transvers anchorage was placed. Bonding done on maxillary and mandibular teeth except maxillary and mandibular lateral incisors and mandibular right 1st premolar. Leveling and alignment with 0.014 NiTi arch wire covered with plastic tubing positioned over the segment of wire traversing the molar extraction space, to avoid alteration and protect the soft tissues. Standard sequence of arch wire changes is followed as per treatment progress. To open space for mandibular lateral incisors open coil spring between central and canine are set. In the same time patient referred to surgeon for surgical exposure of upper canines and bonding attachment for traction were set. In maxillary arch maxillary canine traction with 0.019X0.025 steel archwire base with piggyback 0.014 NiTi.

After opening space in mandibular arch, bonding of

mandibular lateral incisors and start leveling and alignment with 0.012 NiTi piggyback with 0.018 steel as base. In maxillary arch, canine become near to arch line and start levelling with 0.014 NiTi, 0.018 NiTi, 0.019X0.025 NiTi then 0.019X0.025 steel. At this stage start space closure by elastic chain from 2nd molar to canine. Simultaneously, open coil spring between central incisors and canine to open space for lingually positioned lateral incisors (push-pull mechanics) in lower to start space closure by elastic chain from 2nd molar to opposite in next side were done.

After opening space for maxillary lateral, bonding upper lateral incisors with bracket inverted upside down and started to align lateral incisors. For finishing 0.021X0.025 TMA arch wire used.

Treatment time was 26 months. Hawley retainers were delivered for full-time usage for the first 6 months and for nighttime usage for an additional 6 months. The occlusion was finished in ideal Class I canine and molar relationship with improved patient smile.

After the treatment, the patient had a well aligned dentition with tight proximal contacts between the second premolars and second molars.



Figure 1. Pre-treatment intra oral photographs.

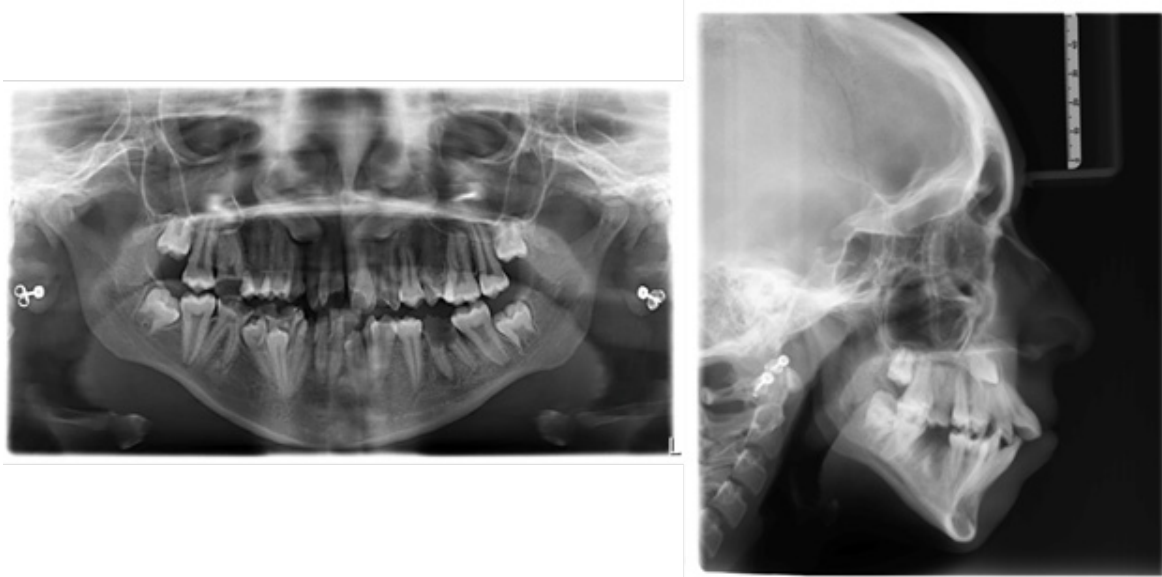


Figure 2. Pre-treatment radiographs.



Figure 3. Post-treatment photographs.

Conclusion

In cases treated with extraction of 1st molars and accompanied with impacted maxillary canines demand more time in treatment, but use appropriate mechanics will give the patient satisfactory results.

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Data availability: All data are available within the manuscript.

Author's contribution:

Data gathering and idea owner of this study: HJA.

Study design: HJA, MKA.

Data gathering: HJA.

Writing and submitting manuscript: HJA and MKA

Editing and approval of final draft: HJA and MKA

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