

4-27-2020

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Recommended Citation

Gulduren, K., & İslam, A. Management of Atypical Symmetrical Ankylosis of Maxillary Deciduous First Molars with Permanent Successors: A Single Case Report. J Dent Indones. 2020;27(1): 38-41

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CASE REPORT

Management of Atypical Symmetrical Ankylosis of Maxillary Deciduous First Molars with Permanent Successors: A Single Case Report

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ABSTRACT

Dentoalveolar ankylosis is the union between the tooth root and the dentoalveolar bone. Clinically, the affected tooth is unsuccessful to erupt, exhibits an infraocclusal position within the dentoalveolar arch, elicits a metallic sound on percussion, and has reduced or absent mobility. **Objective:** This single case report illustrates the management of idiopathically ankylosed maxillary deciduous first molars. **Case report:** The patient was a 6-year-old female with maxillary deciduous first molars in infraocclusal position due to idiopathic ankylosis. The ankylosed deciduous teeth were monitored regularly. After a 27-month follow-up, the infraocclusion became severe. No vertical deficiencies in other alveolar regions were detected. The ankylosed maxillary deciduous molars were extracted. After the extractions, vertical growth of the alveolar bone became normal and the maxillary first premolar successors erupted spontaneously. **Conclusion:** Conservative monitoring of ankylosed deciduous molars would be beneficial and preferred to prevent the impaction of permanent successors and manage the occlusion in a growing child. In case of severe infraocclusion, the deciduous molars may be extracted.

Key words: ankylosis, deciduous tooth, infra occlusion

How to cite this article: Gulduren K, İslam A. Management of atypical symmetrical ankylosis of maxillary deciduous first molars with permanent successors: a single case report. *J Dent Indones.* 2020;27(1):38-41

INTRODUCTION

Dentoalveolar ankylosis is the union between the tooth root and the dentoalveolar bone.¹ Traumatic injuries, dental infections, local metabolic anomalies, deficiency of alveolar bone growth, abnormal pressure of soft tissues, congenital absence of permanent successors, improper tongue pressure, chemical or thermal irritations, and heredity are the major etiological factors.¹⁻⁴

Ankylosis is more common in deciduous teeth than in permanent dentition.⁵ In general, deciduous molars are the most commonly affected teeth.⁶ Clinically, the affected tooth is unsuccessful to erupt, exhibits an infraocclusal position within the dentoalveolar arch, elicits a metallic sound on percussion, and has reduced or absent mobility.⁷ Possible side effects of dentoalveolar ankylosis include vertical alveolar bone loss, tipping of adjacent teeth, midline deviation, impaction of the ankylosed tooth, supra-eruption of the opposing tooth, delayed eruption of permanent successors, and loss of arch length.^{6,7}

Early extraction of an ankylosed deciduous molar may lead to space loss. Monitoring the ankylosed teeth would be beneficial if the infraocclusion is not severe. In the case of progressive infraocclusion, extraction of the ankylosed deciduous molars is recommended for normal occlusal development.⁶ After extraction, space maintainers may be needed.⁸

This single case report presents a 46-month follow-up of a 6-year-old female patient with idiopathically ankylosed maxillary first deciduous molar teeth and shows the clinical significance of monitoring these teeth.

CASE REPORT

A 6-year-old female patient was referred to the pediatric dentistry department with chief complaints of pain and dental caries in November 2015 (T1). On the basis of initial panoramic X-ray and intraoral examination,



Figure 1. Panoramic X-ray at T1

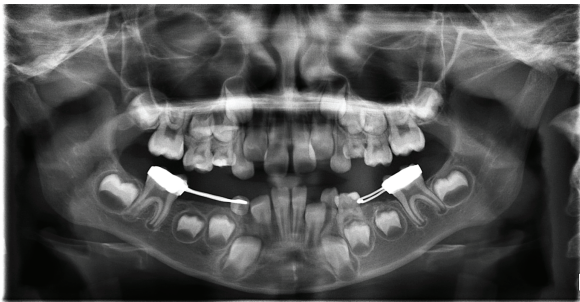


Figure 2. Panoramic X-ray at T2

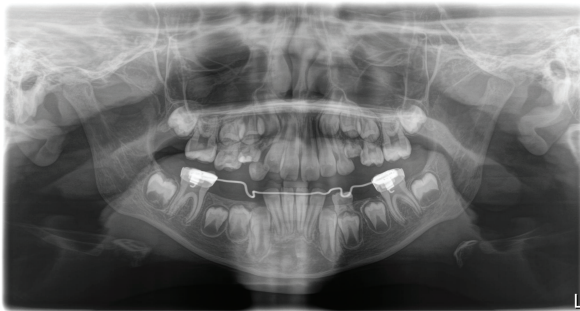


Figure 3. Panoramic X-ray at T3

dentin caries and bilateral maxillary deciduous first molars in infraocclusal positions were diagnosed (Figure 1). The mandibular right first and second deciduous molars and the mandibular left second deciduous molar were extracted. After the extractions, two fixed-space maintainers with bands were bonded to the mandibular first molars (Figure 2). The infraoccluded maxillary deciduous first molars were monitored regularly.

A follow-up panoramic X-ray was acquired in October 2016 (T2). The maxillary deciduous first molars became more infraoccluded (Figure 2). At T2, the mandibular deciduous canine teeth were extracted, and a lingual arch as a space maintainer was applied to the mandibular arch (Figures 3 and 4).

In February 2018 (T3), the maxillary first molars were monitored again. The deficiency in vertical alveolar growth on the left and right maxillary deciduous first molar regions increased, and these teeth became more



Figure 4. Intraoral photos at T3



Figure 5. Occlusal photo of the maxillary arch after extraction of the maxillary deciduous first molars

infraoccluded compared with those at T1 and T2. No vertical deficiencies in other alveolar regions were detected from T1 to T3. Even though premolar successors existed, the maxillary deciduous first molars were symmetrically ankylosed. The patient was subjected to detailed orthodontic examination at T3, including dental models, photographs, and panoramic X-ray. The maxilla was obviously narrow. Space analysis revealed a loss in the maxillary arch length due to the detected ankylosed maxillary deciduous first molars (Figures 3 and 4). Both ankylosed teeth were extracted to prevent the impaction of the permanent successors and maintain normal occlusal development. The slow expansion of the maxillary arch with a removable appliance was also planned.

The maxillary deciduous first molars were extracted by a surgeon. The operation was carried out under general anesthesia at the request of the family. Following the extraction of maxillary deciduous first



Figure 6. Expansion appliance from the occlusal view

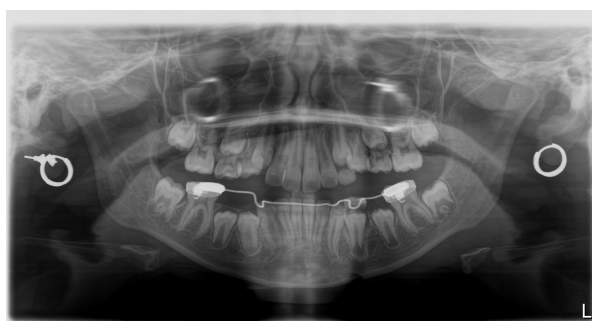


Figure 7. Panoramic x-ray at T4

molars, maxillary expansion with the removable appliance was initiated (Figures 5 and 6). Unfortunately, the patient's cooperation with the appliance was very poor. She missed her appointments and stopped using the appliance after a couple of months. As a result, the desired and planned expansion could not be achieved.

Finally, the patient was examined and a final panoramic X-ray was taken in September 2019 (T4). The patient's examination at T4 revealed normal vertical growth of the alveolar bone and spontaneous eruption of the maxillary first premolar teeth (Figure 7).

DISCUSSION

Clinical management of ankylosed deciduous teeth with permanent successors depends on the severity of the infraocclusion. Early diagnosis and effective treatment plan are essential to prevent progressive infraocclusion of an ankylosed tooth.⁷ Several studies suggested monitoring the infraoccluded teeth,⁹ early extraction and space maintenance,¹⁰ restoration of occlusal height to maintain the occlusion and prevent tipping or overeruption,¹¹ luxation,¹² and extraction in case of delayed exfoliation.¹³

Usually, extraction of ankylosed deciduous molars is recommended if the infraocclusion is progressive and

severe.⁶ In the present case, infraocclusion of maxillary deciduous first molars was mild and at the initial stage. When the infraocclusion became more severe during the 27-month follow-up period, the ankylosed deciduous teeth were extracted. After the extractions, normal alveolar vertical growth was observed.

The congenital absence, impaction, abnormal position, and late eruption of the permanent successors are common reasons for the retained deciduous teeth.¹⁴ In the present case, the maxillary permanent premolar successors were in normal position. However, the maxillary first deciduous molars were symmetrically ankylosed. The extraction of the ankylosed deciduous molars prevented their further retention and ensured the normal eruption of permanent premolars. Jenkins and Nichol have also reported in a case series study that the presence of permanent successors does not ensure the natural exfoliation of deciduous teeth.

Previous studies showed that infraocclusion of deciduous molars might lead to the tipping of adjacent teeth.^{3,12} Depending on the severity of space loss, an open space may need to be opened for the normal eruption of permanent successors.¹² Although the adjacent deciduous teeth tipped toward the infraoccluded maxillary deciduous first molars in the current case, tipping on both sides was very mild. When the maxillary arch was found to be narrow, maxillary expansion with a removable appliance was planned. However, the patient stopped using the appliance; thus, the desired expansion could not be achieved. Permanent successors erupted spontaneously after extracting the infraoccluded teeth.

Premature loss of deciduous teeth may lead to space loss and affect arch integrity.¹⁵ In the current case, two fixed-space maintainers that were then changed into lingual archwire were used in the mandible to prevent spaces after the extraction of several deciduous teeth. At the end of the follow-up period, enough space for permanent teeth was found in the mandibular arch.

CONCLUSION

This case study demonstrated the management of idiopathic ankylosis in certain deciduous teeth with permanent successors. Panoramic X-rays helped us to monitor ankylosis severity by determining vertical alveolar growth deficiency and compose a specific treatment plan for ankylosed deciduous molars.

As a conclusion, conservative monitoring of ankylosed deciduous molars with panoramic X-rays would be beneficial and preferred to prevent the impaction of permanent successors and manage the occlusion in

a growing child. In case of severe infraocclusion, the deciduous molars may be extracted.

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(Received January 14, 2020; Accepted February 23, 2020)