

Clinical Management of Unilaterally Impacted Mandibular First and Second Molars

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Orthodontic traction of impacted teeth can present mechanical challenges, especially when impacted molars are involved. Tooth impaction is uncommon, however, with an overall incidence of between 5.6% and 18.8% of the population.¹⁻⁶ Mandibular molar impaction is even more rare, with the incidence of second molar impaction reportedly between .03% and .06%, and that of first molar impaction less than .01%.^{3,7}

Although the likelihood of ankylosis is not high in such cases, the uncertainty of its diagnosis and the consequences of compromising adjacent teeth make proper diagnosis critical.⁸ An additional dilemma when impacted molars are involved is the inability to use common tests for ankylosis such as percussion and mobility. Also, radiographic indications may not always be reliable.⁹

Previous articles have proposed methods for treating molar impactions,¹⁰⁻¹² and an effective technique for extruding impacted incisors using a removable appliance was recently described.¹³ The present article shows a fixed "eruption-assisting" appliance that can efficiently extrude impacted molars while ruling out ankylosis and limiting adverse effects on the adjacent teeth.

Case Report

A 12-year-old female presented with unerupted, impacted mandibular right first and second molars (Fig. 1). The periapical x-ray did not show any obvious signs of root resorption on the adjacent bicuspid root, but did show the root dilaceration of the first molar. Because a definitive diagnosis of ankylosis could not be made for the impacted molars, it was decided to postpone comprehensive fixed appliance treatment until the possibility of molar eruption could be verified.

The patient was referred for surgical exposure and bonding of gold chains to both impacted mandibular molars. One week after surgery, a fixed "eruption-assisting" appliance was placed and activated to provide an extrusive force on the molars (Fig. 2). The appliance consists of a lower lingual arch with acrylic added for support and to allow extension distal to the second premolar. This distal extension includes two .020" round TMA wires embedded into the acrylic and activated by attaching them to the gold chains on the molars with elastic thread. In this case, due to the mesial angulation of the molars, the TMA loops were placed slightly distal and occlusal to the impacted molars, thus directing the forces in a disto-occlusal direction.

Figure 3 shows a reactivation of the first molar to the appliance. The chain to the second molar had already been removed, once the tooth had reached its proper occlusal level. The "eruption-assisting" appliance was removed after a little more than two months, and full fixed appliances were placed (Fig. 4). Some redness was noted in the gingival and soft tissues, as is commonly seen upon removal of tissue-contacting appliances.

Discussion

Although it would have been advantageous to definitively diagnose ankylosis prior to surgical

exposure, this was not possible due to the location of the impacted molars. The alternative--extraction of both molars--would have required a long-term prosthodontic solution. Therefore, the "eruption-assisting" appliance was used to verify that molar extrusion could occur, allowing treatment to progress while only minimally compromising the adjacent teeth. Had eruption not occurred, ankylosis would have been diagnosed and an alternative treatment plan could have been determined.

This appliance would be useful in improving extrusive mechanics any time there is a potential for ankylosis, while minimizing unfavorable effects on the adjacent teeth.

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FIGURES



Fig. 1 12-year-old female with unilateral impaction of mandibular right first and second molars.



Fig. 2 Fixed "eruption-assisting" appliance.



Fig. 3 Reactivation of first molar.



Fig. 4 Patient after removal of "eruption-assisting" appliance and further molar eruption with conventional fixed appliances.

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FOOTNOTES

1 TMA: Registered trademark of Ormco/"A" Company, 1717 W. Collins Ave., Orange, CA 92867.