

CASE REPORT Orthodontic Uprighting of Horizontally Impacted Mandibular Second Molars

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The following case was treated in two phases. During Phase I, iatrogenic impactions of the mandibular second molars occurred. Later, Phase II therapy corrected that problem.

Phase I Treatment

A 9-1/2-year-old female presented with crowding in both arches, a mandibular shift to the right, a right posterior crossbite, and a deep bite (Fig. 1). The treatment plan involved rapid palatal expansion and partial fixed appliances.

The patient wore a Haas-type maxillary expander for six months. At the same time, the molars and incisors were bonded in both arches, and open-coil springs were used to increase arch length by advancing the incisors. Insufficient attention was paid to preventing distal tipping of the mandibular first molars, however, and the second molars reacted by becoming horizontally impacted. This was discovered at the end of Phase I, which lasted 27 months (Fig. 2).

After advising the family of the situation and giving the patient a 15-month rest period, I consulted with an oral surgeon. We determined that since the impactions were iatrogenic, the teeth should be saved if possible.

Phase II Treatment

The patient began the second phase at age 13 (Fig. 3). Goals were to upright the impacted molars with surgical-orthodontic treatment, and to correct the Class II relationship on the right side and align the midlines with full edgewise appliances and elastics. Brackets and bands were placed in both arches. The impacted teeth were then uncovered surgically, and tubes were bonded to their distobuccal surfaces with Fuji Ortho LC light-cured adhesive. A superelastic .018" Copper NiTi archwire was placed, and the impacted molars were covered with flaps.

After three months, the left second molar had uprighted somewhat and its tube was visible, but the right second molar had not moved appreciably (Fig. 4). The right molar was again uncovered surgically, and this time an .017" x .025" sectional Copper NiTi wire was placed. This wire was deliberately left protruding distal to the second molar to allow the tooth to slide distally (Fig. 5).

Open-coil springs and shims were periodically added adjacent to both mandibular second molars until they were upright (Fig. 6). Fixed appliances were removed after 21 months due to the fatigue of all parties involved.

The impacted teeth, although fully uprighted, had not reached the occlusal plane. A slight posterior open bite remained on both sides, and the occlusion remained Class II on the right. The patient's profile and smile were attractive, however, and no teeth were extracted (Fig. 7).

The keys to Phase II treatment in this case were two recent technological advances: a hydrophilic light-cured adhesive and superelastic archwires. Today, one might use a thermal-activated .017" x .025"

Copper NiTi wire. The distal end of each sectional archwire could be sandblasted, and a small ball of light-cured adhesive could be bonded to prevent the wire from pulling out of the second molar tube.

Discussion

What can be learned from this case? Some clinicians might have chosen to treat this patient by extracting three bicuspid. This would have avoided tipping the mandibular first molars and could perhaps have eliminated Phase I altogether, since the maxillary expansion could have been accomplished later.

Others might have attempted to treat the case without extractions, but with greater care not to tip the mandibular first molars distally?perhaps by performing more lateral expansion of the mandibular arch, without mesiodistal force vectors during the time when the second molars were vulnerable to impaction. If the mandibular first molars were moved distally, a distal root tip could have been applied, and occlusal composite build-ups might have kept the first molars from extruding. Progress panoramic x-rays could have revealed the distal tipping of the first molars earlier, allowing corrective distal root tip to be applied before the second molars became impacted.

The treatment outcome might have been improved by placing a lingual arch between the mandibular first molar bands to maintain their rotations as the open-coil springs and shims were added. The patient might also have been encouraged to wear her elastics more regularly and to remain in treatment until the malocclusion was fully corrected. Nevertheless, this case shows that horizontally impacted mandibular second molars can be treated conservatively with a favorable outcome. □

FIGURES

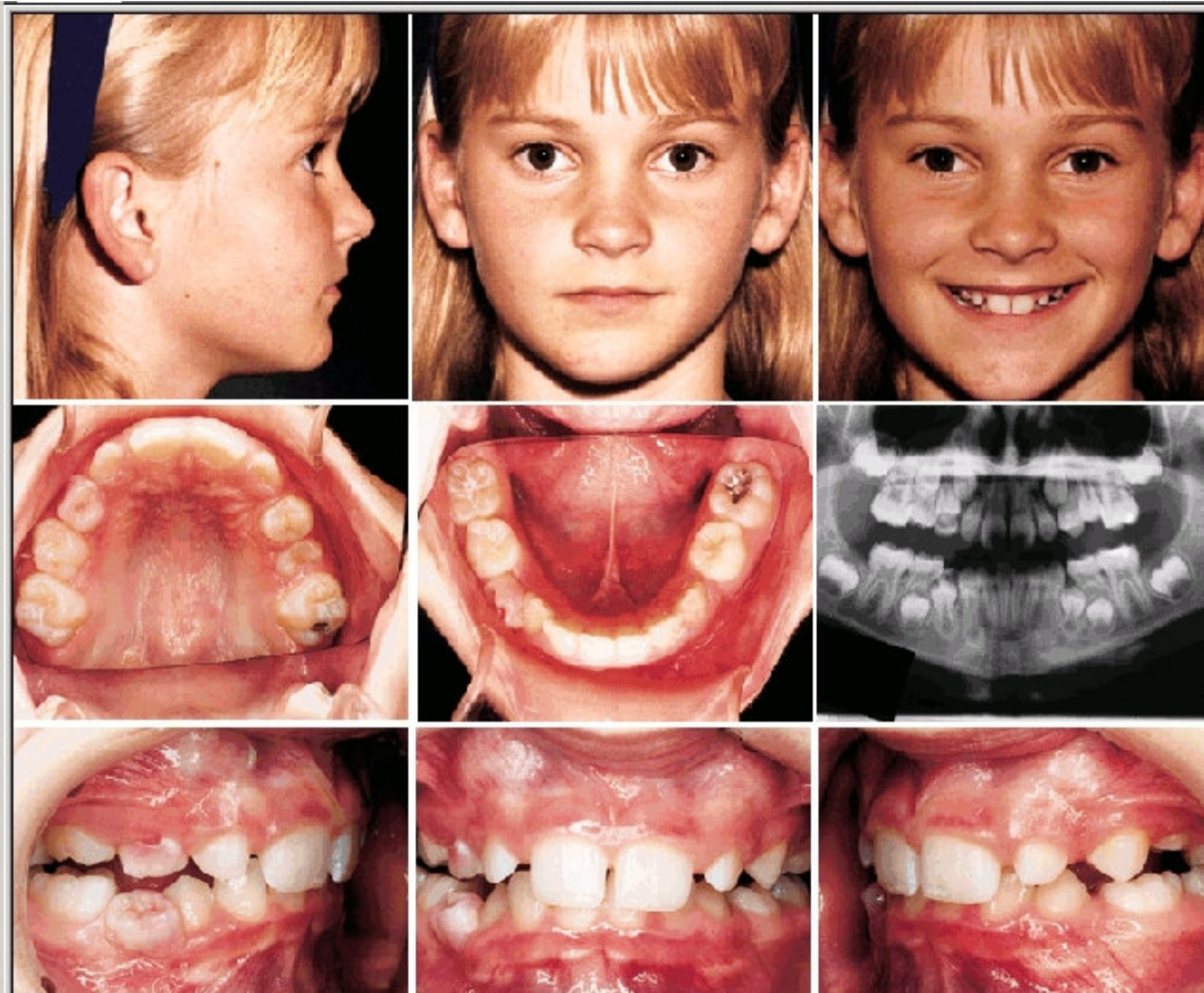


Fig. 1 9 1/2 -year-old female before treatment.

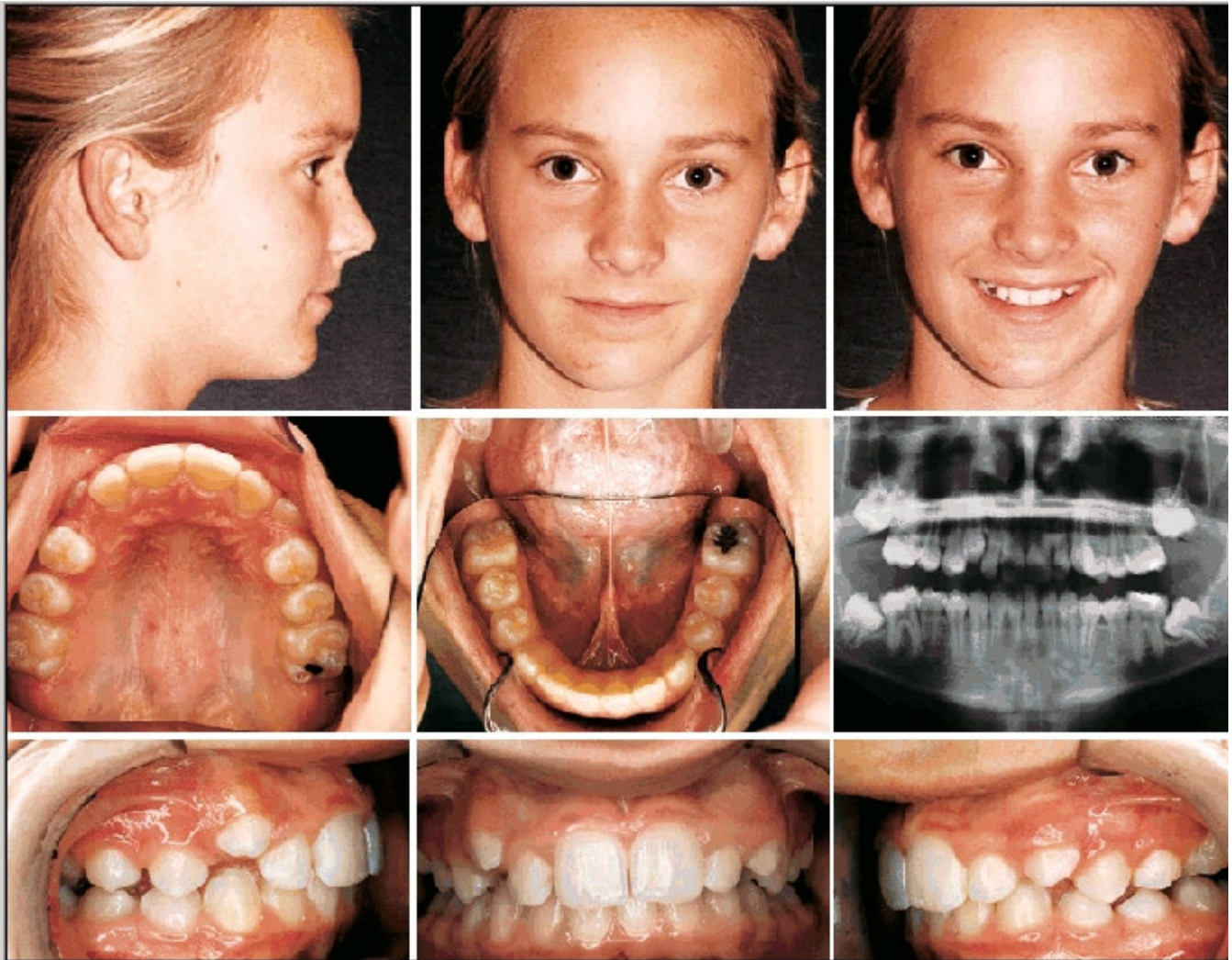


Fig. 2 Patient after 27 months of Phase I therapy.



Fig. 3 Patient at age 13, prior to Phase II.



Fig. 4 After five months of mandibular second molar uprighting.

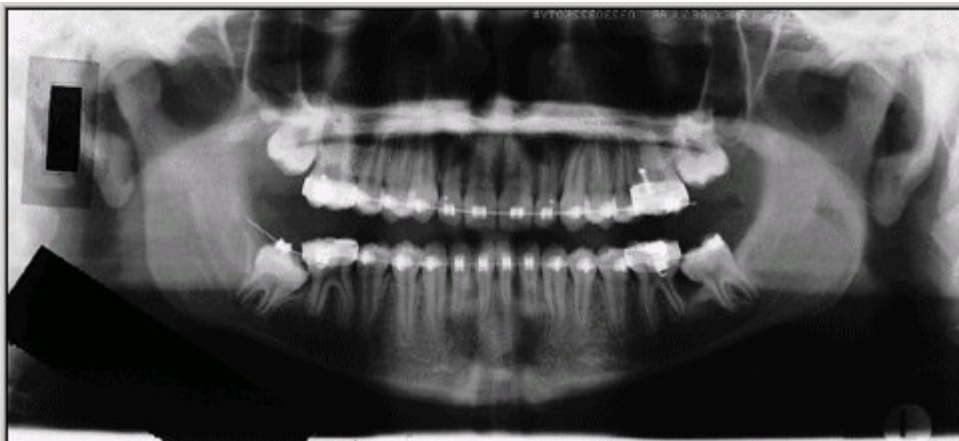


Fig. 5 After nine months of mandibular second molar uprighting.



Fig. 6 After 19 months of mandibular second molar uprighting.



Fig. 7 Patient after 21 months of Phase II therapy.