

CASE REPORT

Second Molar Extraction: The "Second Choice" Procedure

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Orthodontic treatment once aimed primarily to straighten teeth. Today, in contrast, discussions of orthodontic treatment also refer to beautiful faces, nice profiles, good lip support, and full smiles.¹ Now that good photographic records have been accumulated over many years, orthodontists have become much more critical of the effects of treatment on the aging face. As a result, the proportion of patients treated without extractions has increased dramatically over the past 30 years.²

This change in the emphasis of treatment has created a dilemma for the orthodontist. If extractions are not performed, teeth may be placed in unstable positions, leading to an overreliance on retention. If retainers are not worn consistently, as is often the case, an unacceptable degree of relapse may occur. Although bonded

retainers are used far more often than in the past, they can present problems related to breakage, oral hygiene, decay, periodontal disease, and long-term supervision. Therefore, treatment results still need to be as stable as possible.

Anterior retraction after premolar extractions may require the use of contraction mechanics, resulting in poor facial esthetics.³ Removal of teeth is sometimes necessary to achieve an acceptable result, however, depending on factors such as the patient's age; the amount of leeway space, crowding, and protrusion; the eruption of the second molars; and the size of the teeth.

In some cases, removal of the second molars may be the solution. This is sometimes referred to as the "second choice" procedure, because under ideal conditions the patient might oth-

erwise have undergone nonextraction treatment with subsequent removal of the third molars. The morphology and occlusal relationship of the third molars are never as good as those of the second molars, which generally favors their extraction. Furthermore, patients must be monitored until the third molars erupt, because a small percentage of them will need molar uprighting, particularly in the lower arch.

On the other hand, second molar extraction can be performed under local anesthetic, avoiding the risks associated with general anesthesia and hospitalization. It also eliminates any worries about relapse after the eruption of the third molars. Second molar extraction results in significantly less retraction of the incisors and lips than is seen with first premolar extractions.³ Moreover, patients who undergo second molar extraction will have 28 teeth in the long term, whereas many premolar extraction patients may also need their third molars removed, leaving them with only 24 permanent teeth.

Diagnosis and Treatment Plan

A 13-year-old female presented with concerns about the



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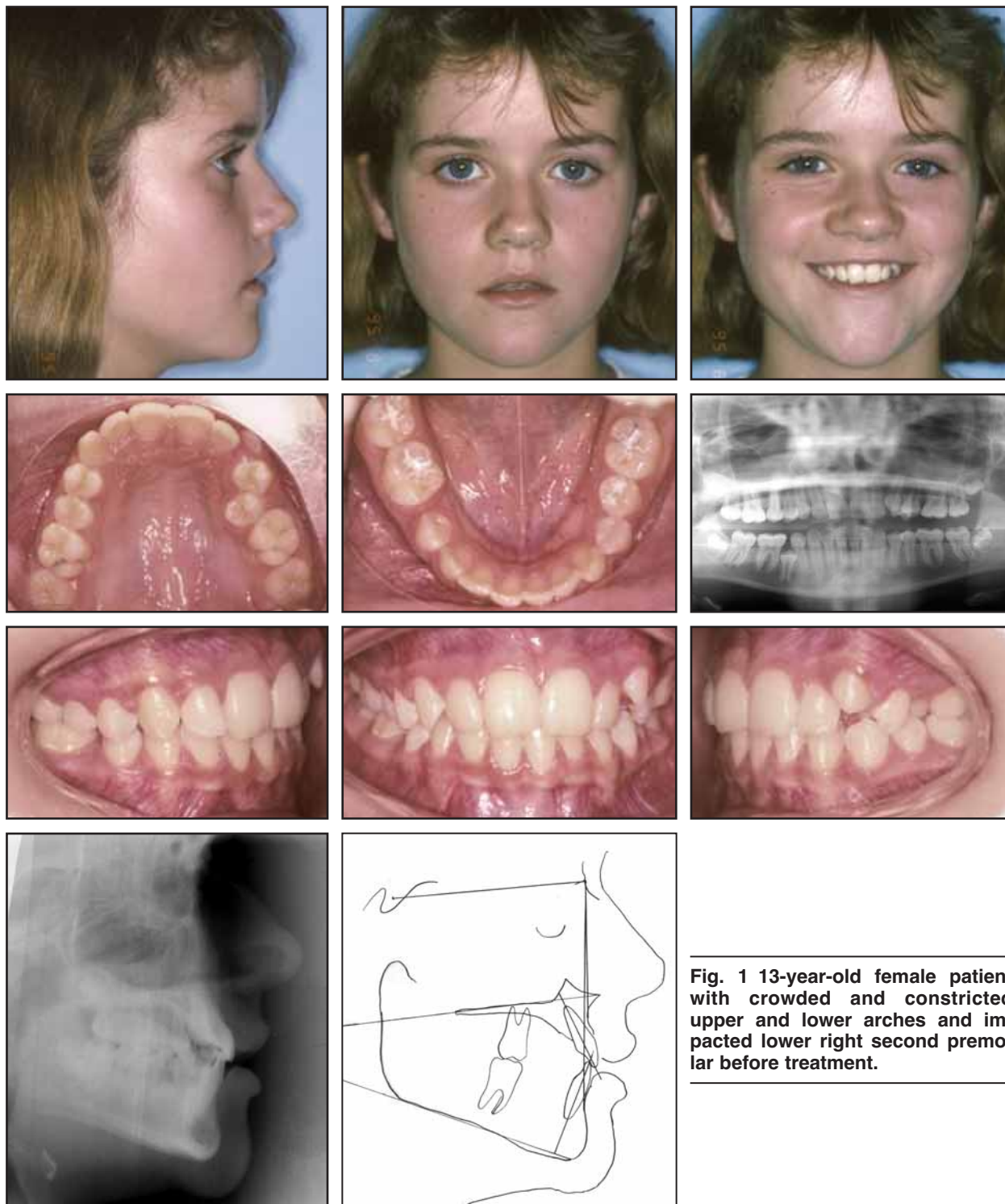


Fig. 1 13-year-old female patient with crowded and constricted upper and lower arches and impacted lower right second premolar before treatment.

irregularity of her teeth (Fig. 1). Her profile was slightly concave, and the nasolabial angle was mildly obtuse. On smiling, the upper midline was shifted slightly to the left and the lower midline slightly to the right. Her overjet and overbite were within the normal range. The first molar relationship was Class I on the right and a half-unit Class II on the left. The patient's most significant problem was crowding, with both arches mildly constricted and the

lower right second premolar impacted in the archform. A panoramic radiograph revealed that all permanent teeth were present. Only the crowns of the third molars were formed, and there was insufficient space for them in the arches.

Extraction of four premolars would have left too much space, resulting in anterior arch constriction after space closure. It was unlikely that enough space would be available to accommo-

date the third molars. Therefore, the treatment plan was to extract all four second molars.

Treatment Progress

After removal of the second molars, the four first molars were banded. A palatal bar was inserted in the upper arch to derotate the upper left first molar, and a lip bumper was placed in the lower arch. After four months, a removable appliance was fitted in the upper arch, with finger springs adjusted to distalize the first molars (Fig. 2). A Kloeohn facebow supported by headgear was placed on the upper first molars, with instructions given to wear it 12 hours a day. The facebow was adjusted to deliver a force through the center of resistance of the first

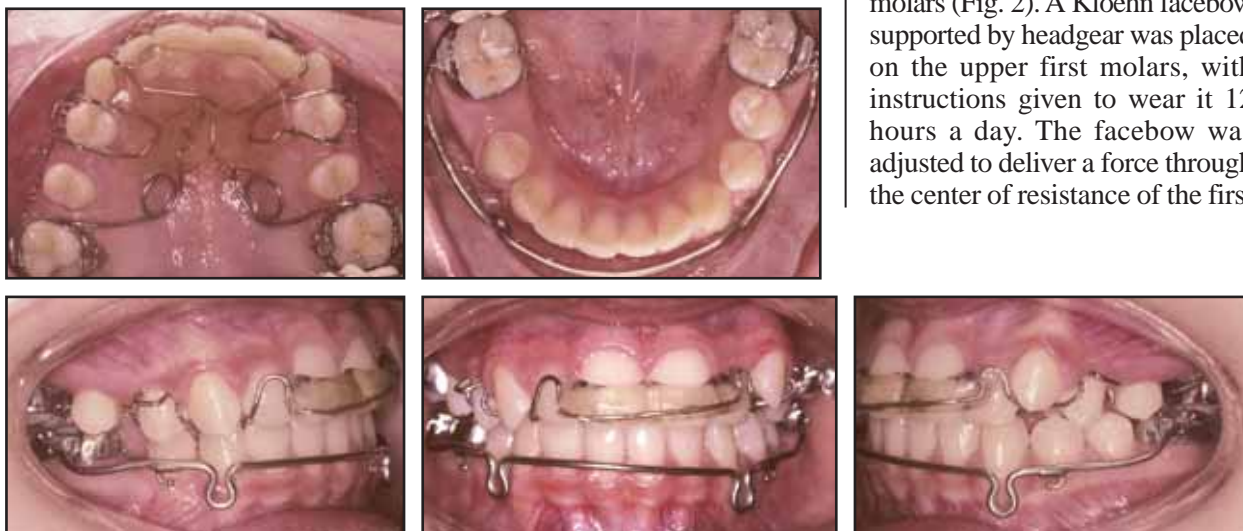


Fig. 2 Upper removable appliance with finger springs used for distalizing first molars.



Fig. 3 Upper appliance modified after four months of headgear wear to allow right first premolar to drift distally.

**TABLE 1
CEPHALOMETRIC DATA**

	Pretreatment	Post-Treatment
SNA	86°	82°
SNB	85°	80°
ANB	1°	2°
Upper 1/1 to maxillary plane	110°	110°
Lower 1/1 to mandibular plane	92°	92°
Maxillomandibular plane angle	26°	28°



Fig. 4 Upper removable appliance discontinued after two more months; transpalatal bar refitted to molar bands.



Fig. 5 Class III elastics placed from upper first molars to canine hooks on lip bumper to maintain lower first molar positions.



Fig. 6 Upper midline allowed to drift toward correction.



Fig. 7 Elastic placed from canine hook on facebow to Kobayashi hook on upper right central incisor to continue midline correction.



Fig. 8 After 23 months of treatment, elastics used to close remaining spaces.

molars, thus producing bodily movement.

Patient compliance was good, and after four months of headgear wear the four first molars were in a Class I occlusal relationship, with sufficient space anterior to the first molars to align the arches without unstable proclination. The upper right first premolar clasp was cut to allow spontaneous drifting (Fig. 3), and the patient was instructed to wear the headgear only at night (eight hours per day). After another two months, the removable appliance was becoming loose and was discontinued. The palatal bar was refitted, and the anterior teeth were allowed to drift (Fig. 4). Significant improvement was noted in the midline positions.

After 11 months of treatment, the lower arch was bonded with standard edgewise brackets (Andrews prescription), and an .014" nickel titanium archwire was inserted. Three months later,

the lower right second premolar was bonded, an .018" nickel titanium wire was inserted, and light Class III elastics were placed from the upper first molars to the canine hooks on the lip bumper to maintain the lower first molar positions (Fig. 5). The upper teeth were allowed to continue drifting toward correction of the midline (Fig. 6).

After 15 months of treatment, the upper arch was bonded with an edgewise appliance (Roth prescription) on the incisors, and an .014" nickel titanium archwire was inserted. Five weeks later, an .016" nickel titanium wire was inserted in the upper arch, and an .020" stainless steel wire in the lower. To complete the midline correction, the patient was instructed to wear a light elastic from the canine hook on the Kloehn facebow to a Kobayashi hook on the upper right central incisor (Fig. 7). After 23 months of treatment, the patient received

an .019" × .025" stainless steel wire in the upper arch and an .021" × .025" stainless steel wire in the lower. Elastics were used to close all remaining spaces (Fig. 8).

Treatment Results

After 32 months of active treatment, the fixed appliances were removed, and upper and lower removable retainers were delivered (Fig. 9). The patient initially had a Class I incisor relationship with upright incisors; post-treatment cephalometric analysis showed minimal skeletal and incisor change (Table 1). Esthetic contouring of the central incisors was recommended.

The patient stopped wearing her retainers after one year. One and a half years later, at age 19, the results had remained stable, and the third molars had erupted satisfactorily (Fig. 10).

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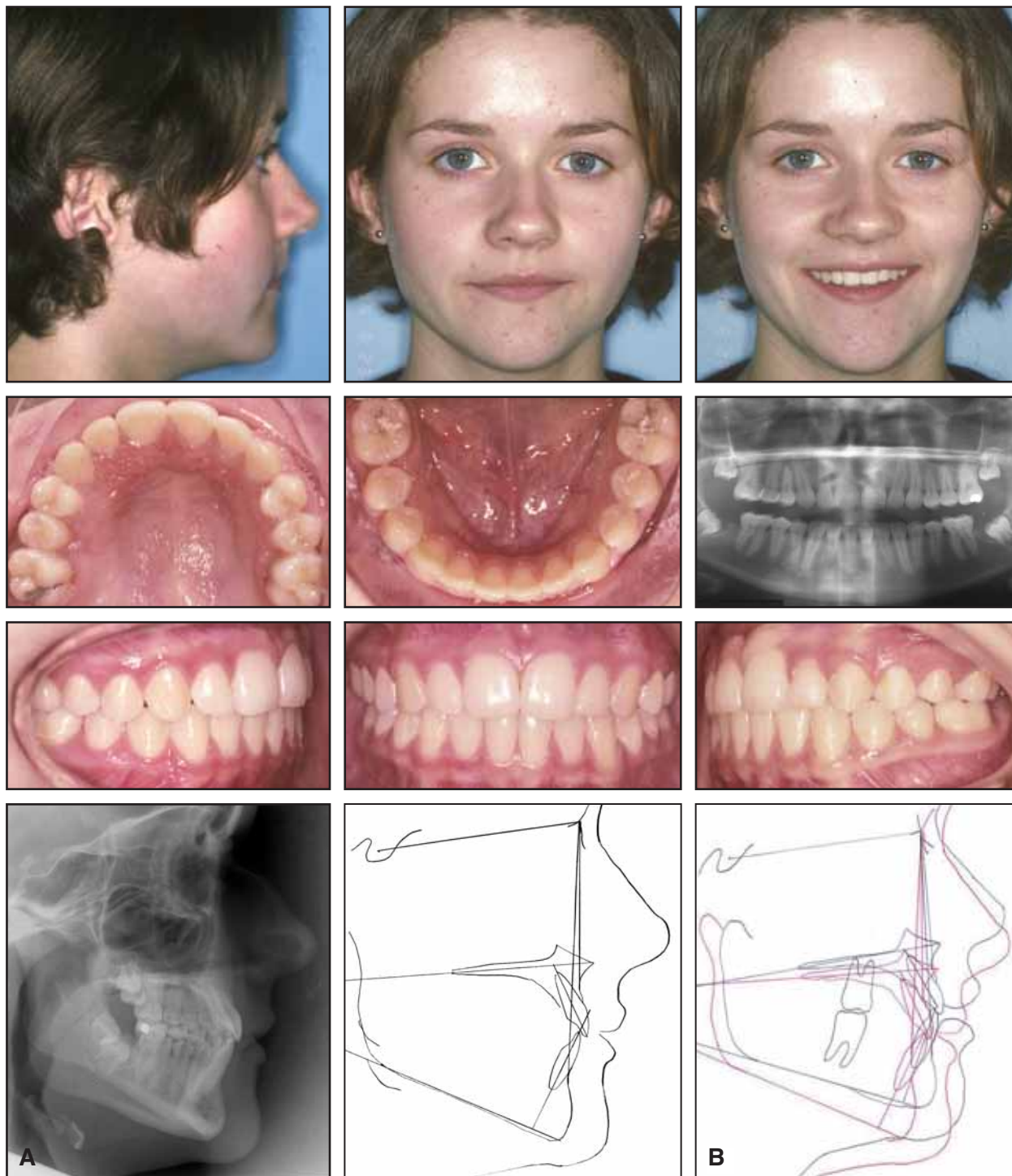


Fig. 9 A. Patient after 32 months of active treatment. B. Superimposition of pre- and post-treatment cephalometric tracings.



Fig. 10 Follow-up records taken 18 months after end of treatment.

Conclusion

As this case illustrates, it may be advantageous to remove second molars instead of premolars in selected patients who cannot be adequately treated without extractions. Second molar extraction can create sufficient space in the posterior segments of patients with crowded arches, providing

good long-term facial and dental esthetics. In addition, it is a relatively simple procedure that leaves the patient with the maximum possible number of permanent teeth.

REFERENCES

1. Moore, T.; Southard, K.A.; Casco, J.S.; Qian, F.; and Southard, T.E.: Buccal corridors and smile esthetics, *Am. J. Orthod.* 127:208-213, 2005.
2. Keim, R.G.; Gottlieb, E.L.; Nelson, A.H.; and Vogels, D.S. III: 2002 JCO Study of Orthodontic Diagnosis and Treatment Procedures, Part 1: Results and trends, *J. Clin. Orthod.* 36:553-568, 2002.
3. Staggers, J.A.: A comparison of results of second molar and first premolar extraction treatment, *Am. J. Orthod.* 98:430-436, 1990.