

# Use of Tip-Edge Brackets to Reduce Posterior Anchorage Requirements after Molar Distalization

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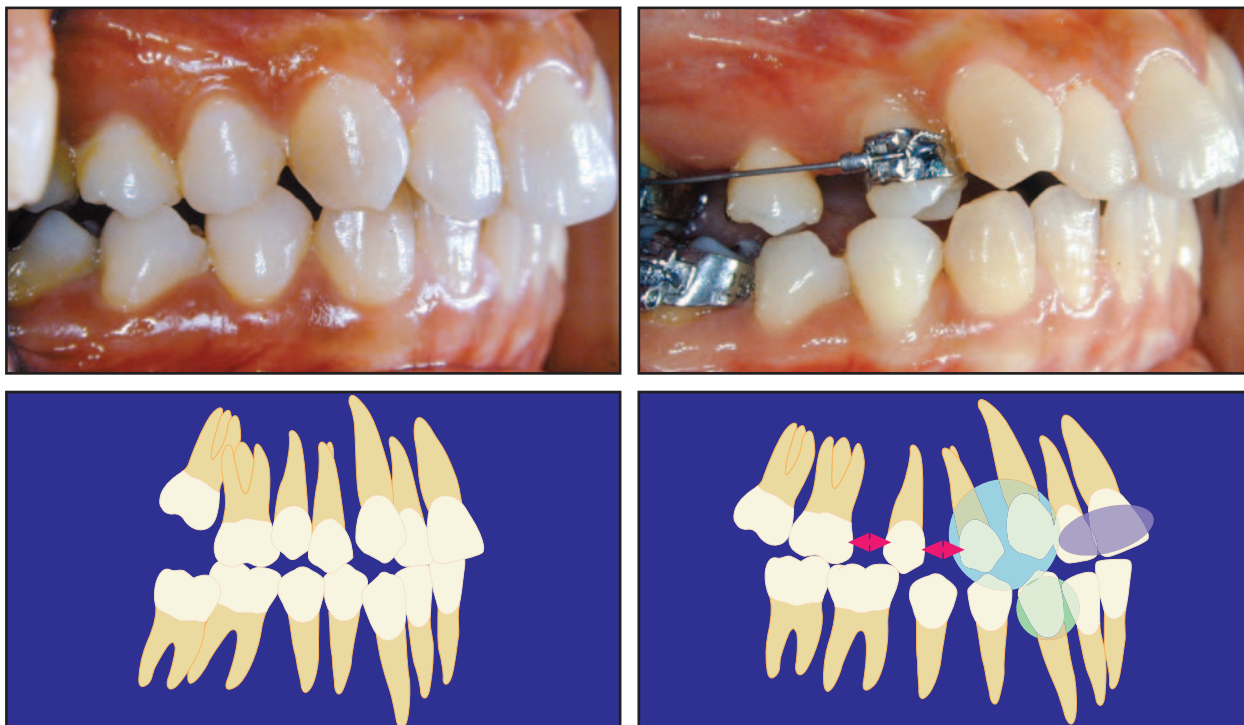
**M**any appliances have been introduced in recent years to move the maxillary molars distally, with the objective of overcorrecting a Class II malocclusion or creating space for alignment of a crowded maxillary arch.<sup>1-5</sup> This article addresses a problem that affects all such systems: maintenance of anchorage in the buccal segments during anterior retraction after molar distalization.

When space is gained in the posterior segments, there may be at least a slight loss of ante-

rior anchorage (Fig. 1). Conventional edgewise brackets tend to tip the premolar roots mesially during leveling and alignment (Fig. 2). Both of these factors increase the posterior anchorage requirements during anterior retraction.

To avoid these unfavorable side effects, we use Tip-Edge\* brackets, which incorporate both Begg and traditional edgewise characteristics. The brackets facilitate the physiologic drift of the

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**Fig. 1** Common effects of molar distalization: posterior space gain (arrows); mesial tipping of upper canine and premolars (large circle); labial flaring of upper incisors (oval); distal tipping of lower canine, canting curve of Spee (small circle).

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Dr. Kaku



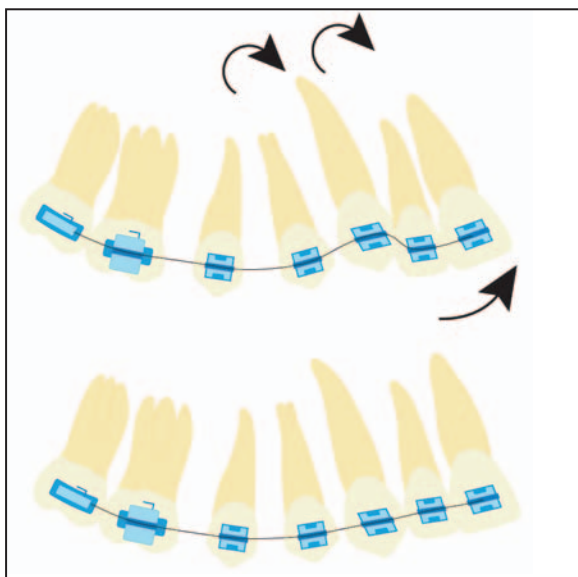
Dr. Arimoto



Dr. Sinohara



Dr. Greenfield



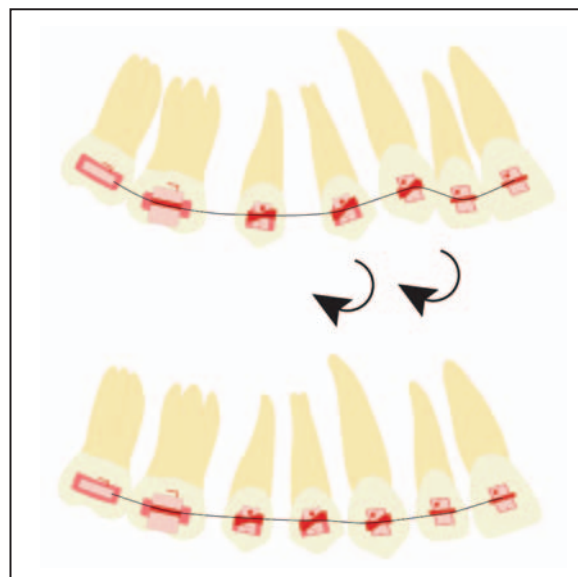
**Fig. 2** Traditional edgewise brackets tend to tip premolar roots mesially during leveling and alignment.

canines and premolars by allowing them to “tip” distally without creating opposite moments<sup>6</sup> (Fig. 3). Because 25% of the force of sliding mechanics can be used up by tipping,<sup>7</sup> the Tip-Edge system substantially reduces the force needed for retraction and thus the strain on anchorage. Three-dimensional control of the maxillary molars is greatly enhanced.

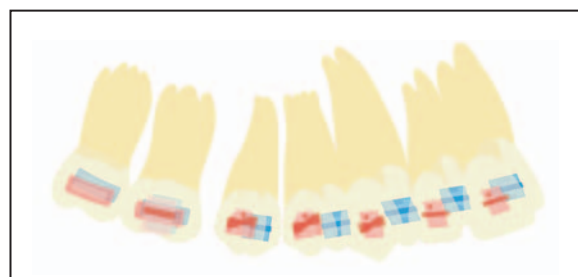
In addition, the anterior teeth are not forced to come forward during leveling and alignment of the premolars, further reducing the anchorage requirement (Fig. 4). Single-wing edgewise brackets can be bonded to the central and lateral incisors, since they are not involved in retraction and alignment of the buccal segments.

### Case Report

An 11-year-old male patient presented with a Class I skeletal and Class II dental malocclu-



**Fig. 3** Tip-Edge brackets allow teeth to “tip” distally without producing opposite moments.



**Fig. 4** Superimposition of tooth movements with edgewise (blue) and Tip-Edge (red) brackets.

sion (Fig. 5). Cephalometric analysis indicated retrusive mandibular incisors and normal maxillary incisors. Both upper canines were blocked out labially.

We decided to move the upper molars into an overcorrected Class I occlusion using the Greenfield Molar Distalizer (GMD).<sup>5</sup> This appliance was chosen because it produces light, con-

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tinuous, well-controlled distalization forces of about 90g per side, with minimal loss of palatal anchorage (Fig. 6).

After eight months of distalization, the

GMD was replaced by an large Nance button, and Tip-Edge brackets were bonded to the canines and the first and second premolars. The pull of the transseptal fibers and the tipping

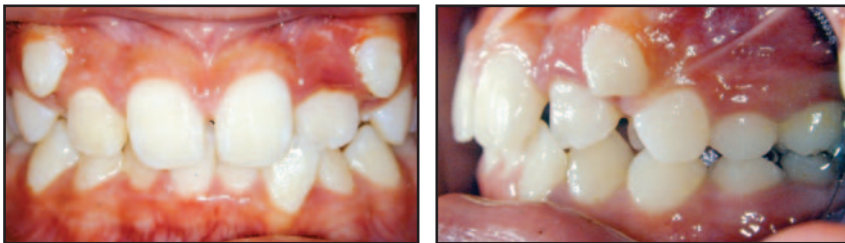


Fig. 5 11-year-old male with Class II dental relationship and blocked-out upper canines before treatment.



Fig. 6 After eight months of molar distalization with Greenfield Molar Distalizer.

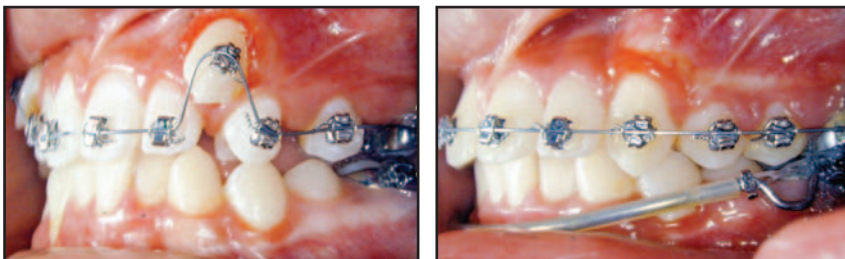


Fig. 7 Tip-Edge brackets bonded to canines and premolars for canine alignment and buccal space closure.

movements allowed by the Tip-Edge brackets permitted these teeth to drift distally, with no loss of anchorage (Fig. 7). Proper axial inclinations of all the teeth were then achieved with a rectangu-

lar archwire (Fig. 8).

The blocked-out canine was aligned, and a Class I molar relationship was obtained (Fig. 9). The canines and premolars were not overtipped

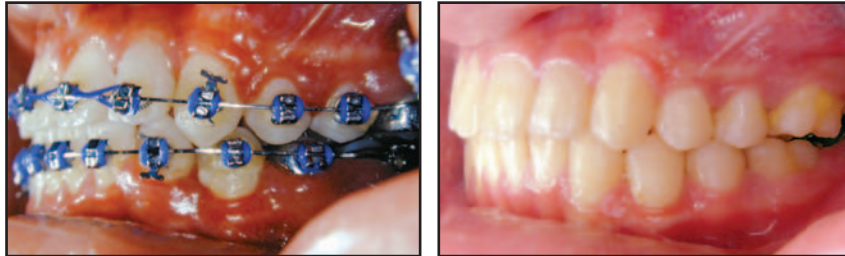


Fig. 8 Axial inclinations coordinated with rectangular archwire.

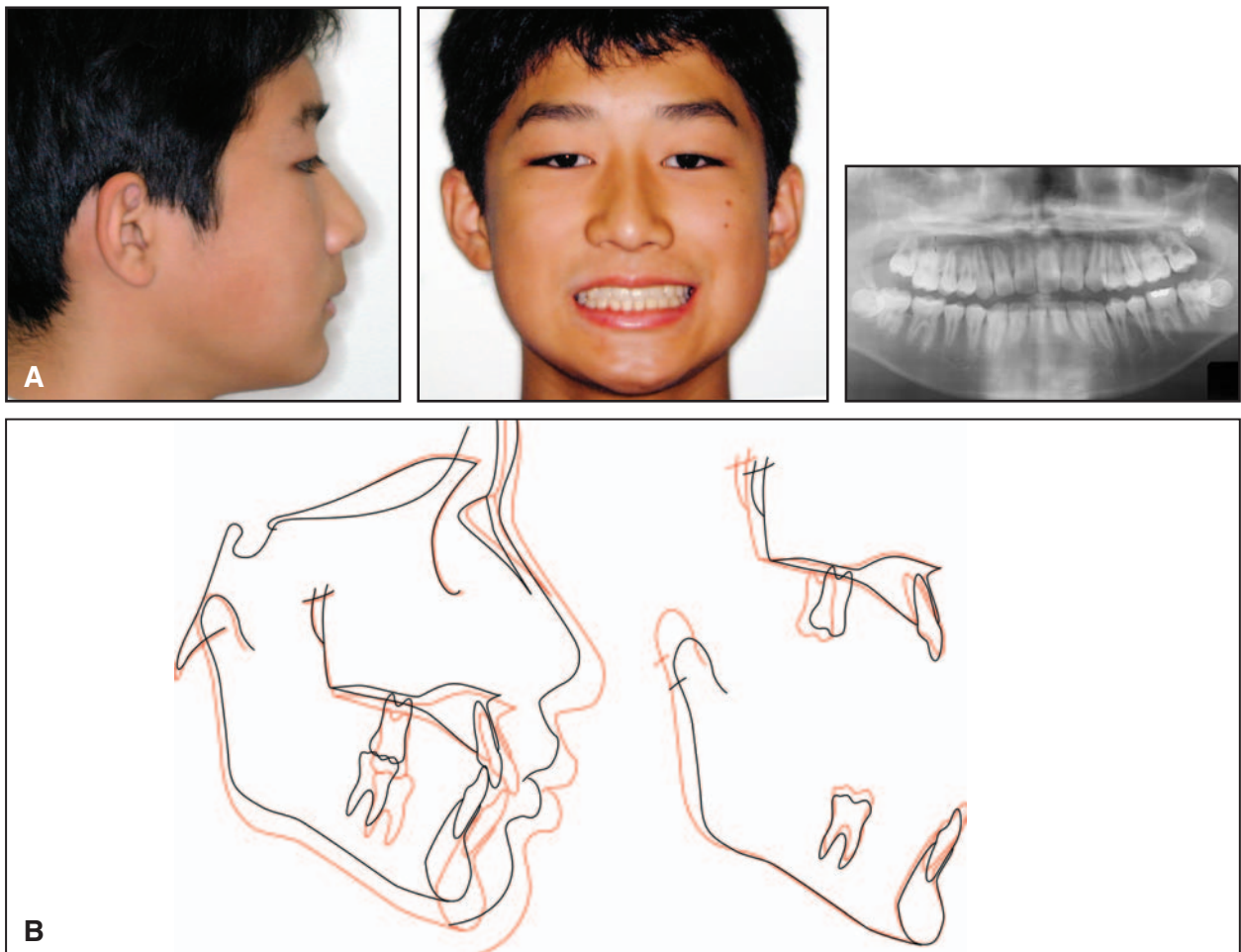


Fig. 9 A. Patient after treatment. B. Superimposition of cephalometric tracings before and after treatment.

by the Tip-Edge brackets. The profile did not change significantly during treatment.

## REFERENCES

1. Gianelly, A.A.; Bednar, J.; and Dietz, V.S.: Japanese NiTi coils used to move molars distally, *Am. J. Orthod.* 99:564-566, 1991.
2. Hilgers, J.J.: The Pendulum appliance for Class II non-compliance therapy, *J. Clin. Orthod.* 26:706-714, 1992.
3. Jones, R.D. and White, J.M.: Rapid Class II molar correction with an open-coil jig, *J. Clin. Orthod.* 26:661-664, 1992.
4. Locatelli, R.; Bednar, J.; Dietz, V.S.; and Gianelly, A.A.: Molar distalization with superelastic NiTi wire, *J. Clin. Orthod.* 26:277-279, 1992.
5. Greenfield, R.L.: Fixed piston appliance for rapid Class II correction, *J. Clin. Orthod.* 29:174-183, 1995.
6. Kesling, P.C.; Rocke, R.T.; and Kesling, C.K.: Tip-Edge brackets and the differential straight-arch technique, in *Orthodontics: Current Principles and Techniques*, ed. T.M. Graber and R.L. Vanarsdall, Jr., 3rd ed., Mosby, St. Louis, 2000, pp. 721-748.
7. Kesling, P.C.: Expanding the horizons of the edgewise arch wire slot, *Am. J. Orthod.* 94:26-37, 1988.