

# A Bonded Transpalatal Arch

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**T**ranspalatal arches have been widely used in clinical orthodontics for correction of molar rotations, anchorage reinforcement, molar expansion and distalization, and vertical molar control.<sup>1-6</sup> Most orthodontists still use molar bands for such appliances; fixed TPAs are soldered to the bands, while removable types are connected to Goshgarian, Wilson, or Mershon attachments on the lingual aspects of the bands. At least three appointments are required for separator placement, band fitting, a pickup impression, and cementation.

By contrast, the majority of today's fixed appliances are routinely bonded from second molar to second molar.<sup>7</sup> Bonding eliminates the discomfort of molar separation and the need for a molar band inventory. Bonded molars have shown less plaque accumulation, gingival inflammation, and interproximal attachment loss than banded molars in both adults and adolescents.<sup>8</sup> Banded teeth, on the other hand, have displayed adverse changes in gingival flora and evidence of unfavorable periodontal response.<sup>9,10</sup>

This article describes a bonded TPA and its application in orthodontic treatment (Fig. 1).



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## Fabrication and Placement

When the clinician anticipates using a transpalatal arch for anchorage control in the upper arch, an extra alginate impression should be taken for fabrication of a bondable TPA. If the need for a TPA is not realized until later, the patient can be recalled for the additional impression, which would take the place of the customary separation appointment.

After the impression is poured, it is sent to the laboratory with special instructions regarding construction of the bondable pads. These pads

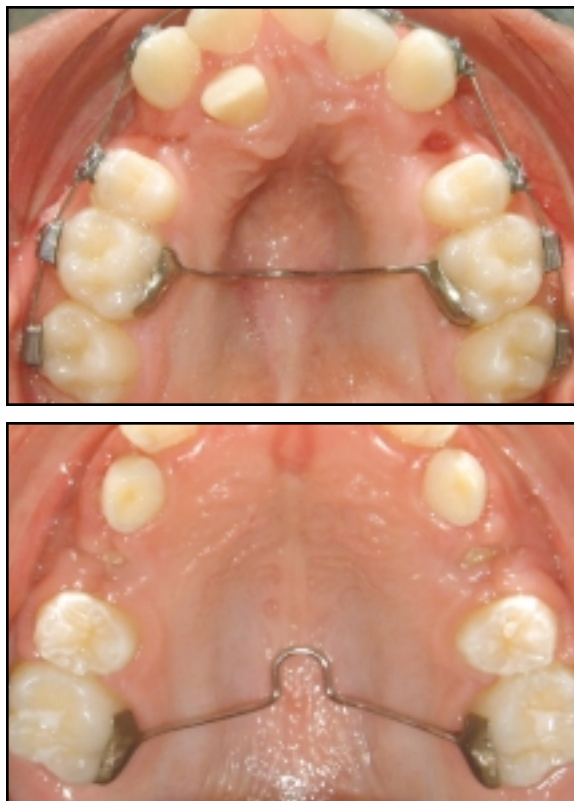


Fig. 1 Bonded TPAs for maxillary anchorage reinforcement.

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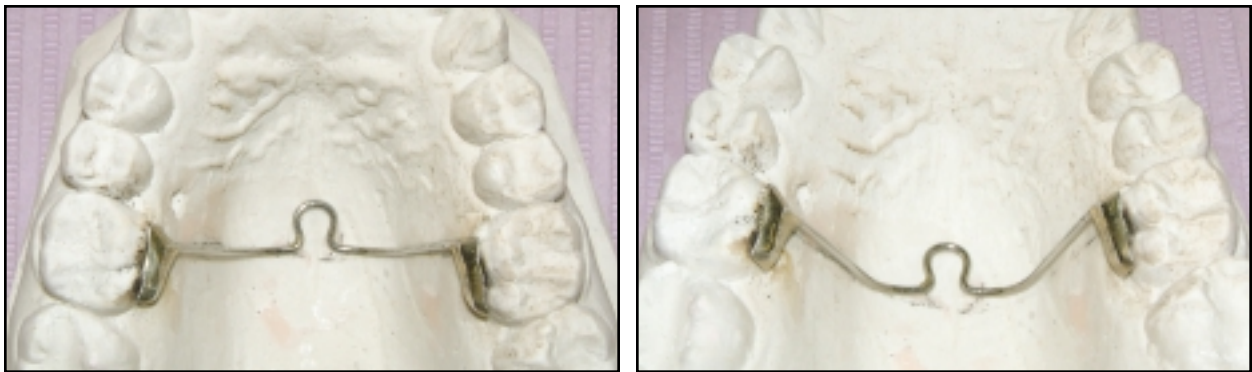


Fig. 2 Laboratory fabrication of bonded TPA.

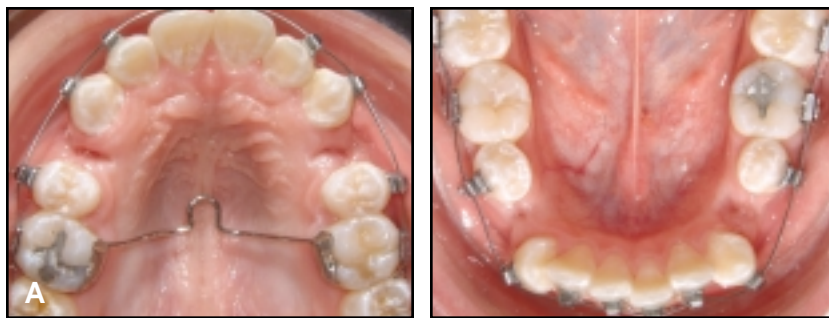


Fig. 3 A. Initial placement of upper and lower fixed appliances and bonded TPA. B. After six months of treatment, including leveling and alignment and near-completion of canine retraction. C. Superimposition of cephalometric tracings before and after six months of treatment.

must be wide, closely conformed to the lingual surfaces of the molars, and microetched—all of which contribute to optimal retention and bond strength. The appliance is easy for the laboratory to construct without any extra time or unusual materials (Fig. 2).

Once it has been received from the laboratory, the TPA can be bonded at the same visit as the upper and lower fixed appliances. The bonding procedure is basically the same, involving adequate isolation, etching, and sealing of the lingual surfaces of the upper molars, followed by attachment of the appliance with a light-cured composite resin. We currently use Transbond XT,\* but any comparable adhesive would be suitable. We do not recommend using self-etching primers for bonded TPAs because of their weaker bond strength.<sup>11,12</sup> Additionally, we microetch the TPA's bondable pads with a sandblaster at the chair immediately before bonding to further activate the mesh surface and enhance bond strength.<sup>13</sup> We recommend attaching dental floss to the TPA during bonding to avoid accidental aspiration or swallowing as it is being manipulated in the patient's mouth.

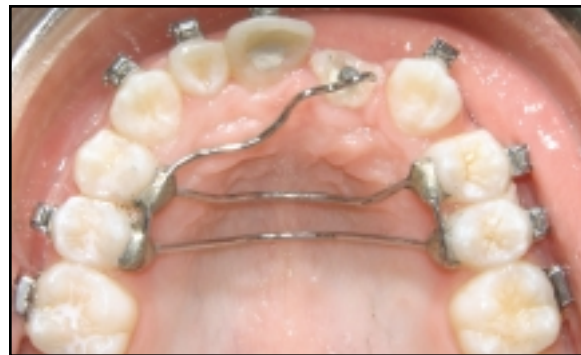
## Discussion

Compared to conventional banded TPAs, the bonded TPA has the following advantages when used for maxillary anchorage control (Fig. 3):

- Promotes better periodontal health.
- Improves oral hygiene around supporting teeth.
- Enhances patient comfort, with no molar separation needed.
- Requires less chairtime and fewer appointments before appliance delivery.

The use of wide, well-conformed, and microetched bondable pads, combined with a systematic bonding technique and careful attention to detail, have yielded excellent bonding success in our department. In fact, we have had no failures in two years. A comprehensive study

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**Fig. 4 Modified transpalatal appliance for forced eruption of maxillary incisor.**

on the failure rate of bonded TPAs is currently under way.

In addition to transpalatal arches, other appliances that have traditionally been cemented to molar bands can be successfully bonded. These include Nance appliances and modified TPAs that extend anteriorly to facilitate the eruption of impacted canines or incisors (Fig. 4).

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