

Engagement of Elastomeric Modules for Efficient Force Delivery

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This article shows how elastomeric modules can be threaded onto archwires and engaged for specific types of force delivery. Malpositioned teeth can thus be corrected more expeditiously, reducing treatment time and improving patient comfort and cooperation while minimizing unwanted side effects and round-tripping.



Fig. 1 A. Threaded elastomeric modules* used to tie all teeth to upper .016" superelastic leveling archwire and lower .016" high-tensile stainless steel Australian archwire.** **B.** After seven weeks, intrusion and derotation of individual teeth allows almost complete ligation of upper .018" nickel titanium archwire and same lower .016" archwire.

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**G&H Wire Company, P.O. Box 248, Greenwood, IN 46142; www.ghwire.com.

Clinical Applications

Threading elastomeric modules onto the first leveling archwires prior to their insertion in the bracket slots allows the engagement of all the teeth, some of which would otherwise be difficult to tie without major archwire deflection or significant risk of debonding (Fig. 1). This technique allows even severely rotated or malpositioned teeth to be quickly aligned, using gentle superelastic archwires or, in appropriate cases, stiffer archwires or spring wires.

If a few extra elastomeric modules are threaded onto the wire, like pearls on a necklace, they can be engaged at subsequent appointments without having to remove the archwire (Fig. 2). Once the force of the first modules has dissipated, this reactivation will make individual tooth movements more efficient. The used modules can easily be removed with ligature cutters. To avoid gingival irritation, the extra modules should not be left on the wire too long before being engaged; in fact, the use of elastomeric modules should be avoided altogether in patients with poor oral hygiene.



Fig. 2 One threaded module engaged to bring lower right lateral incisor labially into arch, with another module awaiting full ligation after sufficient correction by first module. For derotation of lower right central incisor and left and right first premolars, modules are passed below archwire on bracket wings closer to wire, but above it on wings farther from wire.

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For derotation, the module should be engaged in the bracket wings on the side farther from the archwire. Alternatively, the module can be passed around the bracket wing closer to the archwire and under (not engaged to) the archwire, then stretched around the bracket wing farther from the archwire and over (engaged to) the archwire on that side (Figs. 2,3B).

For intrusion or extrusion, the threaded module should be passed around and either below or above the bracket stem, depending on the desired direction of force, then engaged to the archwire at a single point (Fig. 3). The force delivered along the vertical axis of the triangle formed by the module will be less than that from conventional ligation of the archwire in the bracket slot. Not only is this lighter force more physiologically sound, but it also

reduces the magnitude of the opposite forces exerted on the anchor teeth, even in continuous-arch or statically indeterminate force systems. The gentle extrusive force is advantageous in erupting impacted teeth and bringing them into the arch (Fig. 4).

Vertical force delivery and control can be further enhanced by engaging one elastomeric module over another (Fig. 5). Thus, stiffer wires can be used to maintain the vertical and horizontal archforms in the early stages of treatment (Figs. 3,6).



A



B

Fig. 3 A. Elastomeric modules threaded over .016" Australian archwire and engaged to apply gentle intrusive force; springiness and strength of wire help maintain archform and avoid bite deepening early in treatment. **B.** Modules also engaged for derotation and incisor protraction.



Fig. 4 Threaded module used to erupt incisor with gentle force of .012" nickel titanium archwire.



Fig. 5 Two modules used simultaneously on upper right first premolar for controlled, gentle intrusion.

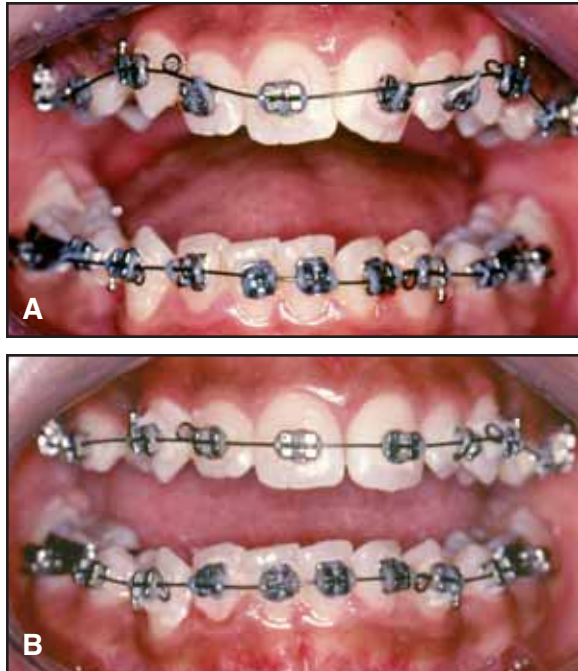


Fig. 6 A. Threaded modules used for rapid decrowding of all teeth, with .016" Australian archwire placed at first appointment. **B.** Patient four weeks later.

Conclusion

In our clinical experience, this method of threading and looping elastomeric modules during leveling and alignment has the following advantages:

- In most cases, allows all teeth to be engaged, either fully or partially, at the first appointment.
- Reduces the incidence of bond failures on severely malpositioned teeth.
- Provides gentle force delivery with enhanced control.
- Allows early correction of most individual tooth malpositions.
- Avoids round-tripping, thus shortening treatment time.
- Requires fewer archwire changes.
- Reduces side effects on anchor teeth.
- Allows earlier use of stiffer wires when control of vertical and horizontal archform is important.

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