

Polyolefin Foam Protective Sports Mouthguard

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Orthodontic patients need protection from mouth injuries during sports as much as any other athletes (Fig. 1), but orthodontic hardware occupies space that would normally be covered by either a preformed mouth protector or a custom-formed vinyl mouthguard.¹⁻⁷ In addition, a custom-fitted device will work for only a limited time because of the tooth movement that occurs during orthodontic treatment.

The “boil-and-bite” mouthguard, which is available at sporting-goods stores, is softened by immersion in hot water and then molded directly

in the athlete’s mouth. Although these can be made as often as necessary, they are bulky and uncomfortable for some patients, can create breathing difficulties, and can dislodge or damage orthodontic appliances during formation or use.

Croll and Castaldi described a method of providing space within a vacuum-formed mouthguard to accommodate minor tooth movements and fixed appliances.⁸⁻¹⁰ Their recommendations can increase the longevity and usefulness of custom-made protectors. However, orthodontic



Fig. 1 Dental trauma from sports injury to orthodontic patient.



Fig. 2 Bop-Stopper polyolefin foam mouthguard adapted to fit by cutting any section with scissor.



Fig. 3 Thick horizontal bumper absorbs force of frontal blow. Vertical section has airholes for breathing.

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patients could benefit from a universally adaptable mouthguard that is inexpensive enough to be used for a short time and then discarded. This article presents such a mouthguard, the Bop-Stopper.*

Mouthguard Design

Marketed as a “crash helmet for your teeth”, the Bop-Stopper is made of Volara,** a fine-celled, irradiation-crosslinked polyolefin foam commonly used in insulation and in protective padding for helmets. Lightweight grades of Volara are suitable for fluoride application trays. The dense grade used in the Bop-Stopper complies with FDA regulations for food contact and is moisture- and chemical-resistant. Volara is soft and pliable, so it will not damage orthodontic brackets or wires.

The Bop-Stopper is large enough that it can be adapted with scissors for nearly any mouth size (Fig. 2). The vertical section is only $\frac{3}{16}$ " thick and has airholes for breathing (Fig. 3).

*Dentaurum, Inc., 10 Pheasant Run, Newtown, PA 18940.

**Voltex, Lawrence, MA.



Fig. 4 Bop-Stopper is easily removed with anterior finger tab.

Most of the protection is provided by the $\frac{1}{4}$ "-thick horizontal bumper, which includes a finger tab for ease of handling and for added protection of the midline area (Fig. 4). A hole in the finger tab can be used to tether the mouthguard to the athlete's shirt or helmet (Fig. 5).

The horizontal bumper opens the bite slightly and thus can deflect the force of impact from a blow to the chin. It also diminishes the effect of trauma on the TMJs from a blow to the mandible, and probably decreases the likelihood of concussion.

Conclusion

Custom-fitted mouthguards, especially the multilayered, heat-laminated type, undoubtedly prevent dental fracture, tooth displacement, and concussion better than any other devices. However, the polyolefin foam mouthguard is less expensive and easier to adapt. Some orthodontists provide their patients with several Bop-Stoppers until a vacuum-formed mouthguard can be fabricated, or at times when treatment mechanics prevent the use of a custom device.



Fig. 5 Shoelace through hole in finger tab can be used to tether mouthguard to shirt.

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