

A New Eruption Attachment for Impacted Teeth

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The closed eruption technique requires traction to be applied to an attachment on the crown of the impacted tooth.¹⁻³ Because amalgams, pins, and lassoes tend to damage the enamel, clinicians now prefer to use bonded attachments such as wire mesh, brackets, pads, or copings, which are connected to the archwire with gold chain, silver chain, power chain, or stainless steel wire.^{2,4-12}

This article describes a new bonded attachment, the U-Flex* eruption device.

Attachment Design

The base of the U-Flex device is “U”-shaped to fit snugly to an incisal edge—the most

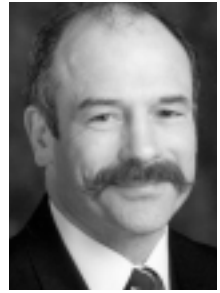
severely curved tooth surface likely to be bonded (Fig. 1). If the surface curvature is less acute, the base can be flexed open slightly with a plier (Fig. 2). The base is flexible enough to be easily molded to any tooth surface (Fig. 3).

The attachment has a low profile to reduce the risk of dehiscence of the overlying soft-tissue flap, and is coated with titanium nitride to prevent allergic reactions. To keep fragments of mesh from breaking off and remaining in the surgical site, the mesh is supported by a thin, flexible metal base. The attached gold chain provides flexible strength without the risk of fracture. The first link is round so that the chain can be rotated

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Fig. 1 U-Flex* eruption device with flexible base, curved to fit incisal edge of upper incisor.



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Fig. 2 A. U-Flex base opened with plier to reduce curvature. **B.** Base on left flexed open from original shape on right.



Fig. 3 A. Base fits snugly over crestal ridge of upper canine. **B.** When flexed open evenly, base fits over palatal ridge of upper canine. **C.** When flexed open asymmetrically, base can be offset on palatal surface of canine. **D.** Base opened almost fully for attachment to palatal surface.

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and traction can be attached from any angle. The base is large enough to be held with a tweezer and easily manipulated into the proper position on the crown (Fig. 4). Links of gold chain can be cut off at each visit as the tooth moves into position, so that the distance the tooth has moved can be estimated from the number of links removed.

Surgical Placement

Surgical exposure of the impacted tooth should be minimized, avoiding the cemento-enamel junction to encourage optimum periodontal support after treatment. The enamel is

etched, without contacting the surrounding soft tissues, and dried with a dental napkin and a carefully positioned suction tube. A thin layer of resin is applied to the tooth, again avoiding the surrounding tissue.

A light-cured composite is placed on the mesh base. To prevent bond failures, it is important to work the composite into the mesh; ideally, a slight excess should be left on the base (Fig. 5). The base is then positioned as desired and pressed down to express the excess composite. It is advisable not to remove the flash or further adjust the base, because any movement can lead to bond failures.

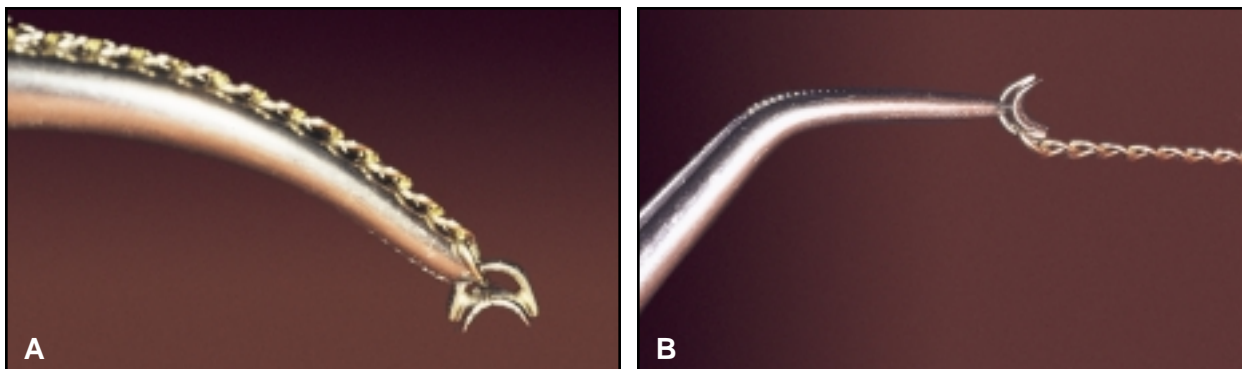


Fig. 4 A. Base grasped by first link of chain, with rest of chain lying on top of tweezer. B. Base grasped with chain hanging away.

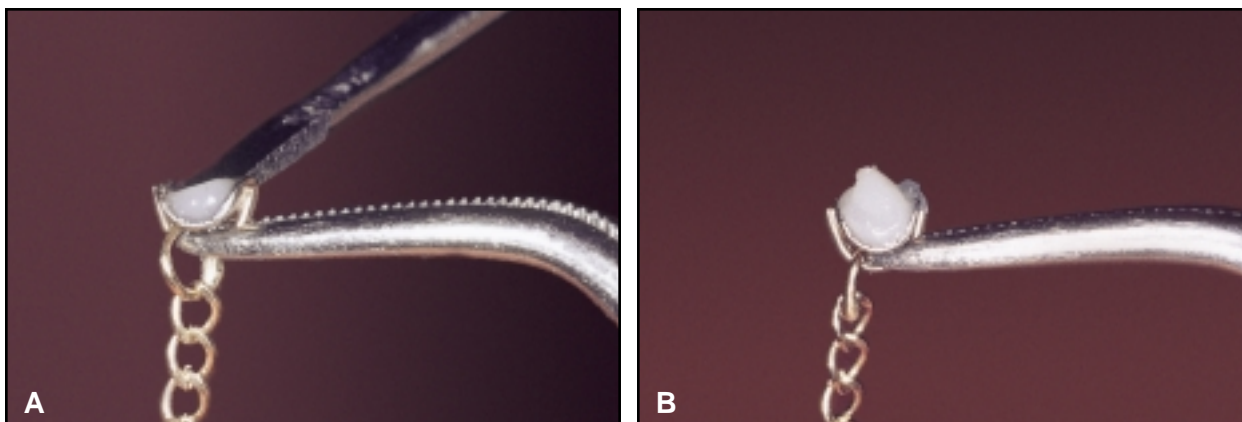


Fig. 5 A. Composite must be worked into mesh base to reduce risk of bond failure. B. Small amount of excess composite left on base to ensure it spreads slightly, providing point of application for debonding plier after tooth has erupted.

The composite is cured with a light unit while holding the base in position. The strength of the bond can be tested with a light tug on the chain. Traction is then applied to the impacted tooth as the clinician prefers.

Once the tooth has erupted, the excess composite around the attachment base provides a useful point of application for the debonding plier. Removal of more low-profile attachments, such as wire mesh, can be much more difficult. After the base has been debonded, it is replaced with a standard orthodontic bracket.

Case Report

A 17-year-old male presented with a Class I incisor relationship and an impacted upper right permanent canine (Fig. 6). The malocclusion was

treated without extractions, using .022" In-Ovation self-ligating brackets* with a Roth prescription and the twin-wire technique of Samuels and Rudge.⁸ The tie wings of the In-Ovation bracket have unique second holes that can be used to hold an auxiliary wire for attachment to the gold chain.

After sufficient space was gained in the upper right canine region, the U-Flex attachment was bonded to the incisal edge of the surgically exposed canine, and a gold chain was passively ligated to the traction archwire (Fig. 7).

Active orthodontic traction was begun four weeks after surgery. Four months later, the bonded attachment broke through the attached gingiva near the crest of the alveolar ridge (Fig. 8).

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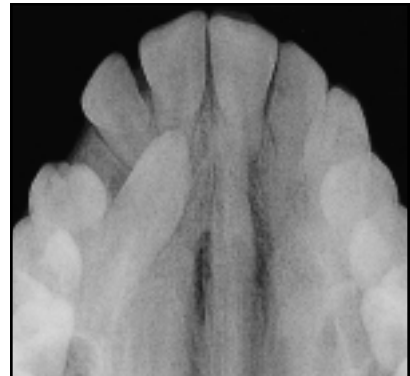
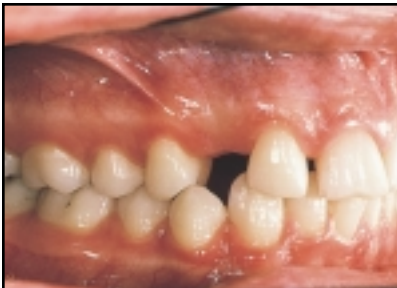


Fig. 6 17-year-old male patient with Class I incisor relationship and impacted upper right permanent canine before treatment.



Fig. 7 U-Flex attachment bonded to nearest available incisal edge of surgically exposed canine.



Fig. 8 U-Flex attachment penetrating near crest of alveolar ridge.

When the tip of the crown reached the archwire, the U-Flex attachment was removed (Fig. 9). It was replaced with a bracket for further alignment of the canine with the preadjusted fixed appliance (Fig. 10).

The patient was offered a small amount of interproximal stripping between the upper and lower central incisors to reduce the triangular spaces, but was happy with his dental appearance and declined further treatment (Fig. 11). The right canine and first premolar should eventually settle more vertically.

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Fig. 9 Retained excess composite on crown of tooth after removal of U-Flex base.

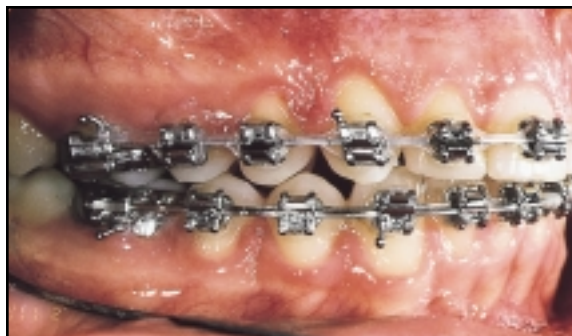


Fig. 10 Traction archwire removed from auxiliary slot, and main archwire used for further alignment of canine.



Fig. 11 Patient after removal of fixed appliances.