

A Simple Method for Single Anterior Tooth Replacement

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Purpose: This article reports a case in which a recently extracted tooth was used as a natural tooth pontic bonded to the teeth on either side of the missing tooth using a Ribbond ribbon.

Materials and Methods: A bondable, reinforcing polyethylene ribbon was used to bond a natural tooth pontic to adjacent teeth.

Results: Acceptable esthetics were obtained and the result was satisfactory for the patient.

Conclusion: After one year of clinical use, direct construction of a single-tooth replacement using the natural tooth pontic still provided satisfactory esthetics and function. The technology which makes this adhesive restoration possible is the development of a high strength, high molecular weight, biocompatible polyethylene fiber. This easily handled material must be evaluated in long-term clinical studies.

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For many years, traditional metal and ceramic fixed parital dentures have been utilized as a treatment modality to replace missing teeth in restorative dentistry. With recent advancements in adhesive technology, new and stronger composite resin materials, and the development of a bondable polyethylene fiber, it is possible to create a conservative, highly esthetic prosthesis that is bonded directly to the teeth on either side of the missing tooth. Ribbond (Ribbond, Seattle, WA, USA) is made from an ultrahigh modulus, ultrahigh molecular weight polyethylene fiber that is woven into a porous ribbon. It is biocompatible, inert, colorless, and translucent. The combination of the fiber material and the bi-directional weave makes the ribbon exceptionally pliable and compliant.¹ These properties make it easy to manipulate the woven ribbon. Due to its pliability, Strassler⁶ reported that it re-

mained in position on the teeth after placement. This makes Ribbond useful in both direct and indirect restorations. Periodontal splints, directly bonded bridges, fixed orthodontic retainers, or fixed partial dentures with a composite resin pontic are some of the clinical uses of polyethylene ribbon.^{1,4,7} All these indications involve variations of a common technique. The objective of this article is to report a case where a recently extracted tooth was used as a natural tooth pontic bonded to the teeth on either side of the missing tooth using a Ribbond ribbon.

MATERIALS AND METHODS

A 42-year-old man was admitted to the Operative Dentistry Clinic of the Faculty of Dentistry, University of Selçuk. The patient's chief complaint was about mobility of the maxillary left central incisor. Alveolar bone resorption was observed in intraoral radiographs. The clinical examination revealed Class III mobility. As the patient had to leave the country the next day, there was insufficient time for the fabrication of a resin-bonded bridge using a metal framework. The tooth was extracted and an adhesive splint bridge using the natural tooth as a

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Fig 1 The image of patient after extraction of tooth.



Fig 2 Extracted tooth separated from its root.

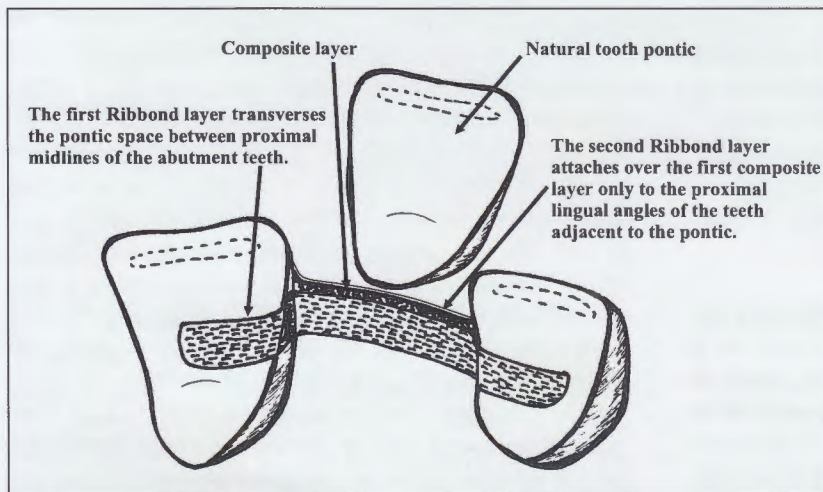


Fig 3 Illustration of the use of double-thickness Ribbon to create a beam effect and increase the resin reinforcement of a pontic area.

pontic was designed (Fig 1). The root was removed below the CEJ using a high-speed diamond bur under water cooling immediately after extraction of the tooth (Fig 2). After removing the pulp tissue, the coronal pulp chamber was irrigated, dried, and restored with a bonded resin composite filling material. The lingual surface of the crown was trimmed as a pontic, covered with a resin composite material, and polished using polishing disks and rubber cups.

After applying a rubber-dam to the patient, a 2-mm-wide strip of tin foil was burnished onto the lingual surface of the abutment teeth to determine the length of Ribbon needed for the splint. With a hand instrument, the tin foil was tucked interproxi-

mally so that it closely adapted to the contours of the teeth. The measured length of Ribbon was then cut and kept on a clean pad until ready for use.

The teeth were cleaned using a prophylaxis cup with a nonfluoridated pumice paste and then thoroughly rinsed and dried; the lingual and interproximal surfaces were acid etched for 45 s (K-Etchant, Kuraray, Osaka, Japan). The etched surfaces of the teeth were covered with a layer of unfilled bonding resin (Clearfil Photo Bond, Kuraray, Osaka, Japan), gently air thinned and cured for 20 s.

The following steps were performed without using the overhead operator light to prevent premature setting of the light-cured composite resin. A

thin layer of a flowable microhybrid composite resin (Star-flow, Danville Materials, Santa Rosa, CA, USA) was applied to the etched lingual and interproximal surfaces of the teeth by using a Centrix syringe, but was not cured. The Ribbond was wetted with a light coating of unfilled bonding adhesive (Clearfil Photo Bond) and excess material was removed using tissue paper. The Ribbond was pressed into the unpolymerized flowable composite resin using a hand instrument and tucked interproximally. A second layer of Ribbond was then applied to the surface of the resin composite layer, only at the proximal-lingual angles of the teeth adjacent to the pontic (Figs 3 and 4). Any excess resin composite was removed around each tooth, and the free surface of Ribbond was light cured for 40 s.

The lingual surface of the pontic was then prepared for bonding (acid etching, application of a thin layer of unfilled bonding adhesive, and light curing). After applying a thin layer of flowable composite, the pontic was applied to the second Ribbond ribbon in the desired position and light cured for 40 s. Excess material was removed, and resin composite-covered Ribbond was then polished with composite resin polishing paste. Figure 5 represents the final restoration, and Fig 6 shows the mirror image of the restoration.

RESULTS

After one year of clinical use, the esthetics and function obtained with this method were still satisfactory. After one month, the periodontal tissue did not show any response to the prosthetic device.

DISCUSSION

Although this article describes the use of polyethylene ribbon for creating a fixed partial denture, it also can be used for other clinical stabilization applications, such as creating a fixed orthodontic retainer, periodontal splinting, embedding into provisional acrylic partial dentures, and stabilizing an avulsed tooth.^{1,4,6} There are few long-term clinical reports on splint partial dentures. Soft tissue irritation due to the resin-bonded surface of the pontic is a potential problem, but polishing of the resin-bonded surface of the pontic in the laboratory prior to bonding to the Ribbond ribbon may prevent irritation.



Fig 4 Clinical image of Ribbond base, before replacement of the tooth pontic.



Fig 5 Natural tooth pontic placed on the Ribbond base and cured for 40 s.



Fig 6 Mirror-image of palatal aspect of the restoration.



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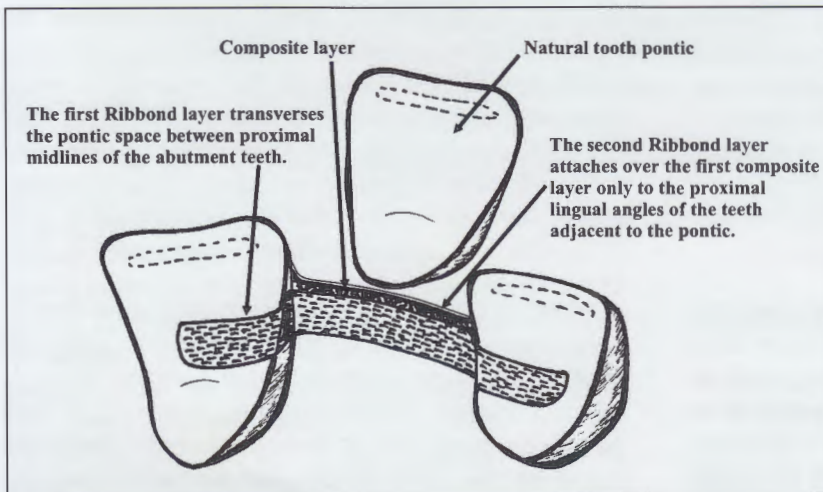


Fig 3 Illustration of the use of double-thickness Ribbond to create a beam effect and increase the resin reinforcement of a pontic area.

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