

Replacement of Missing Anterior with Maryland Bridge using Ribbond: A Case Report

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Abstract

Replacement of missing mandibular central incisor is difficult challenge in esthetic dentistry. Resin bonded bridges or maryland bridges can be considered as a treatment of choice in such conditions, which restore the oral function and esthetic of the patient. Maryland bridge preparation requires minimal preparation of the tooth and the bridge can be attached to the periodontally sound adjacent teeth. The combined use of polyethylene fibre and resin composite help achieve durable and functional result. This case report describes the case of esthetic restoration of a young women with midline spacing of mandibular anterior teeth.



Article History

Received: 17 October 2022

Accepted: 21 December 2022

Keywords

Fibre Reinforced Composite; Maryland Bridge; Polyethylene Fibre; Ribbond.

Introduction

One of the most common form of injury is traumatic damage to the anterior teeth. Patients reporting with missing or traumatised anteriors require immediate attention for restoration of esthetic and oral function.¹


Missing mandibular incisors can be replaced by removal or fixed partial denture or by an implant. The long term use of removable partial denture may

result in bone resorption and flattening of interdental papilla, whereas in cases of fixed partial denture or bridges, an adequate tooth preparation is required of the adjacent tooth which will be used as an abutment. The tooth preparation may result in hypersensitivity and pulpal damage. Maryland Bridge can be used as an alternative treatment plan for restoring the missing tooth in the anterior, to preserve the soft tissue and resorption of the alveolar ridge.²

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Doi: <http://dx.doi.org/10.12944/EDJ.04.02.06>

Resin bonded or resin retained bridges (RBBs/RRBs) are a type of fixed dental prostheses that requires a minimum amount of tooth preparation. With the help of resin cement they are bonded directly on to the tooth surface and the preparation is limited to enamel surface only. These restorations mainly depend on the resin cement for its retention.²

No tooth preparation or minimal tooth preparation to replace the missing teeth using fibre reinforced composite resin, polyethylene fibre mesh have reported to have a 5 year survival rate of 61%.¹

Ribbon or polyethylene fibre mesh is made of ultra-high molecular weight polyethylene fibre with very high modulus. They have high modulus of elasticity, hence give resistance to stretch and distortion. Ribbon fibre are gas plasma treated, which reduces superficial tension and ensures adequate chemical bond to composite.¹ Ribbon ensures unsurpassed fracture resistance, doesn't unravel or rebound and it also results in non-bulky prosthesis.

This article describes a clinical case in which a FRC resin bridge with composite was given for the purpose of aesthetic concern of the patient in the mandibular anterior region until a fixed prosthesis can be planned.

Case Report

A 30 year women reported to the Department of Conservative Dentistry and Endodontics with the complain of spacing in her lower anterior tooth region. Clinical examination revealed spacing between 31, 41 which was around 5-6 mm wide (Fig 1). Because of the aesthetic concerns patient wanted quick

and conservative treatment option immediately so Maryland bridge was planned using Ribbon fibre in this case. The Ribbon material (Ribbon, inc), used in this case for the purpose of reinforcement, was composed of Polyethylene fibres with a multidirectional leno weave.

Technique of Preparation

The entire procedure can be completed in one single appointment and can be done by direct technique.

The steps are as Follows

1. After inspecting the tooth, shade selection was done for composite.
2. Following which the length of Polyethylene fibre mesh [RIBBOND; United states of America] was determined.
3. Tooth were etched using 37% phosphoric acid [Ivoclar] for 30 seconds followed by rinsing with water for 20 seconds.(Fig 2)
4. Bonding agent [Tetric N Bond; Ivoclar] was applied and cured.(Fig 3, Fig 4)
5. After that flowable composite was applied on 31,41 and ribbon was placed horizontally connecting 31,41 and cured (Fig 5)
6. Following this a small piece of ribbon was placed vertically over the horizontal portion using flowable composite and cured(Fig 6)
7. Then the missing space was restored by doing composite build up over the ribbon fibre.(Fig 7)

Instructions given to the Patient

1. Never bite into a hard food or item by putting it on the front tooth that was replaced.
2. The bridge will only help with aesthetics.



Fig. 1: Pre-operative picture



Fig. 2: Etchant application



Fig. 3: Bonding agent applied



Fig. 4: Bonding agent cured



Fig. 5: Ribbon placed horizontally connection 31 and 41



Fig. 6 :Ribbon placed vertically over the horizontal segment



Fig. 7: Post-operative picture after composite buildup

Discussion

For a replacement of missing teeth with fixed partial dentures, the conventional tooth preparation of all the surfaces of the adjacent teeth is usually required.² A missing tooth in the anterior region is a bodily loss that can be disturbing for patients. The lack of awareness of available treatment options makes it challenging to replace a single tooth.³

Implant, Removable partial denture and Fixed partial denture are some of the treatment options available for replacement of missing teeth. However a more conservative approach and less invasive procedure

using resin bonded prosthesis may be considered for such condition to replace missing tooth as it can also help in preserving the remaining alveolar ridge and soft tissue.²

Maryland bridge is characterized by many advantages, including ease of fabrication, bond ability and reparability. It offers a minimally invasive procedure with less tooth reduction than traditional prosthetic replacements. A metal framework traditionally features in Maryland bridge restorations, whereas glass fibre-reinforced composite splints do not require a metal framework and thus make the

restoration more aesthetic and easier to bond with adjacent teeth. It do not have any metal shadow.³

Ribbon is a polyethylene fibre with a multidirectional leno weave, used as a reinforcement ribbon. All composite resin systems can be bonded to Ribbon, and their biocompatibility is claimed to be high by the manufacturer.¹

The replacement of a single anterior tooth is sometimes necessary in order to restore the most optimal aesthetic appearance. For these cases, a fibre-reinforced fixed partial denture can be fabricated using a natural tooth pontic, composite resin pontic, or acrylic denture tooth as a pontic.¹ Reinforced polyethylene fibres can be used to create composite materials with enhanced mechanical properties, such as stiffness, strength and toughness. Fibres can enhance the properties of brittle composite materials by acting as stress-bearing components and by stopping or deflecting cracks.⁴

Bondability, chairside ease of fabrication and repairability are some of the advantages of this method. Also it is economical and less time consuming as the procedure can be completed in single visit. As this approach is relatively less invasive, it allows the patient to opt for other, more traditional tooth replacement methods in future.⁴

Difficulty in maintaining the oral hygiene and its questionable ability to withstand heavy masticatory load can be the disadvantages of this method⁴

For fixed FRC bridges, Studies by Unlu and Belli⁵ and Freilich⁶ have reported a mean survival period of 3 and 4.5 years respectively, which make it a suitable interim treatment option for replacing missing permanent anterior teeth.

Although the technique used in this study was an interim method of anterior tooth replacement, its

conservative preparation and reported success suggest that it may be considered a possible treatment option in certain situations.⁴

Conclusion

The case presented in this article suggests an interim treatment option for spacing between mandibular anteriors. As this technique have several advantages because it does not require any tooth reduction and could be repaired, modified or removed from the abutment teeth without any damage to the sound tooth structure.⁴ Also, resin bonded bridges can be highly effective, as they help in restoring oral function, aesthetics and result in high levelsof patient satisfaction.² Careful case selection, thoughtful design planning, precise preparation and a careful cementation program can all ensure the long-term success of Maryland Bridges, making them ideal treatment option for temporary replacement of individual missing anterior teeth.⁷ Hence, with proper use of clinical techniques, the resin bonded bridge should be considered more frequently as the restoration of choice for esthetic rehabilitation. Also with the advancement in our material and technique we will be able to stronger and more conservative alternatives to regular porcelain fused metal restorations.⁸

Acknowledgement

The author would like to thank, Peoples college of Dental Science and Research Centre and department of Conservative dentistry and Endodontics for their guidance and support to complete this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest

No

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