Bonded Reinforcing Materials for Esthetic Anterior Periodontal Tooth Stabilization: A Case Report
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Abstract
Historically, many materials have been used to fabricate splints for periodontally involved teeth. Older methods relied mainly on wire or silk ligatures, but the advent of dental resins and resin adhesive techniques in the late 1950s allowed clinicians to achieve better, more esthetic stabilization techniques. This paper reports a modality for anterior periodontal tooth stabilization using a fiber reinforced composite splint.

Key Words: Periodontal Stabilization; Fiber Reinforced Splinting

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Introduction
In 1995, Miller and others reported a case that involved the placement of an immediate and indirect periodontal, prosthetic splint. They described the use of gas-plasma-treated, woven polyethylene fabric to reinforce composite resins used for periodontic splinting. The initiative to place a thin but strong composite resin based splint was met with the introduction of a high strength, bondable, bio-compatible, esthetic, easily manipulated, neutral colour fiber that could be embedded into a resin structure. This led to the development of fiber reinforcement systems. Fiber reinforcement systems are chemically consisting of two groups: a) Ultra high molecular weight polyethylene fibers and b) Long and short glass fiber reinforcement.

Advantages of fiber reinforced composite material periodontal splinting are a) ease of application with minimal tooth preparation, b) low to moderate cost as compared to crown and bridge stabilization, c) Reversibility: can easily be removed when splinting is no longer considered necessary, d) ease of repair in case of failure through rebonding and reapplication of new material, e) facilitating more aggressive treatment modalities on teeth with questionable prognosis prior to long term stabilization, f) high esthetic value and g) ease of accommodation of daily home oral hygiene practices. This paper reports the management of periodontally involved mandibular anterior teeth stabilization using a fiber reinforced composite splint.

Case report
A 28 year old male patient presented with the chief complaint of mobility of lower anterior teeth. Two months following phase I therapy and minor occlusal adjustments, the patient presented with grade II mobility of 32, 31, 41 and 42. Teeth were prepared on the labial and lingual aspects with a prophylaxis cup and non-fluoridated pumice paste. Teeth were prepared using medium grit finishing strips. Owing the thin dimension of fiber splint, channel preparation on the lingual aspect of the teeth was considered unnecessary. As the importance of fiber reinforced composite stabilization relies on the interproximal areas, the splint was determined to extend from the midlingual region of the canine to that of its contralateral. Both the proximal and lingual aspects of the teeth were acid etched with 32% phosphoric gel etchant for a period of 30 sec and later copiously irrigated to remove all acid residues and thorough isolation was done. Resin adhesive was applied on the proximal and lingual etched enamel of the teeth as only enamel was to be engaged in the splint. The facial areas were shaped and light cured for 20 seconds (Figure 2).

Light cured composite resin was then applied onto the lingual surfaces of the teeth and the previously prepared ribbon was adapted closely to the tooth surfaces with advancing finger tips and plastic instruments, tucking it interproximally until it made contact with the tooth surfaces simultaneously smoothening the
excess composite expressed onto the outer surface of the ribbon during initial adaptation to achieve a smooth surface(5) (Figure 3).

![Figure 3](image1.png) ![Figure 4](image2.png)

The entire unit was light cured for 60 seconds from both the labial and lingual aspects with addition of a final smoothening layer of composite resin especially over the loose ends of the ribbon to prevent fraying (Figure 4). The patient was recalled after 24 hours for the final finishing of the splint with composite finishing tips and composite polishing paste taking care not to bite into the fiber ribbon.(3) The patient was educated on oral hygiene and was dispensed an interproximal brush for daily use in addition to routine oral hygiene practices.(4)

**Discussion**

Tooth mobility serves as an important clinical parameter in determining prognosis, splinting has been advocated for stabilizing periodontally weakened teeth.(4) Since the inception of bondable polyethylene woven ribbons, many of the banes of conventional methods using pins, wires and meshes have been intercepted. This has been achieved through chemical bonding and enhanced mechanical failure resistance.

All this with minimal bulk and the trait of being colour neutral affording better camouflage within the composite.(3) Moreover being relatively inert in the oral environment and dimensionally stable to thermal changes, they serve the requisites of ideal tooth stabilization modalities.(2)

**Conclusion**

Tooth stabilization using the innovative techniques incorporating bonded reinforcing materials for anterior periodontal tooth stabilization abides by the conservation of natural tooth structure, provides good fracture resistance with unparalleled esthetic value.

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