

Periodontal Splinting - An Adjunct to Non-Surgical Periodontal Therapy to Manage Tooth Mobility

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Abstract

As periodontal disease progresses, it leads to progressive loss of attachment apparatus subsequently leading to tooth mobility. The resultant tooth mobility adversely impacts the phonetics, function, comfort and speech of an individual. A proper case selection with considerably stronger teeth available to support the mobile teeth and where the oral hygiene will not be compromised, a periodontal splint is a viable adjunctive treatment option. This case reports discusses splinting of mobile lower anterior teeth of a 37-year-old male presenting with the mobility grades between II and III. A fiber reinforced resin composite splint (Ribbond) is applied to alleviate patient's discomfort and restore function while preparing the patient for future soft tissue periodontal surgery. Ribbond presents with superior elasticity, adaptability, reparability, bonding and resistance to fracture as compared to other conventional methods of splinting. The easier and quicker application along with superior aesthetics, makes Ribbond the material of choice for periodontal splinting.

Keywords: Periodontal splinting; Ribbond; Tooth mobility; Fiber reinforced resin composite

Introduction

Tooth mobility is one of the sequelae of the advancing periodontal diseases [1] which is a consequence of acute periodontal apparatus inflammation [1], trauma from occlusion, and apical shift of the rotational center of the tooth as bone loss progresses. Tooth mobility has been widely investigated as the measure of functional condition of the periodontium along with being a possible aggravating factor for the periodontal disease [2]. The resultant tooth mobility adversely impacts the masticatory and phonetic function of the patients while also reducing patient's comfort [2,3]. Loss of periodontium around the teeth subjects them to secondary occlusal trauma which further contributes to tooth mobility [4]. In such conditions, a periodontal splint, as described by the American Academy of Periodontology glossary of periodontology is, 'an appliance designed to immobilize and stabilize loose teeth' [5] is the proposed treatment option [3,6,7]. It is pertinent to mention here that periodontal splinting alone does not treat mobility. It is an adjunct to the periodontal therapy [6,8]. With careful selection of the case for periodontal splinting, the life expectancy of mobile teeth is considerably increased [3], periodontium reaches a stable environment to promote reattachment of lost supporting tissues [3,6,7] and improves the functionality, comfort and aesthetics for the patient [6,7]. However, periodontal splinting has come under scrutiny by some critics who consider periodontal splinting to adversely affect patient's oral hygiene measures resulting in deterioration of periodontium [8].

With technological advancements and incorporation of newer materials, the supposed ill effects of the periodontal splints have considerably been eliminated [7,9,10]. This case report discusses the application of periodontal splint as an adjunct to periodontal therapy, for a severe chronic periodontitis case, using fiber-reinforced composite - Ribbond [9,11] to stabilize the dentition prior to soft tissue augmentation for phenotype modification [6].

Case Report

A 37-year-old male presented to the dental OPD at the Ziauddin University, Karachi, Pakistan, with the chief complain of mobile anterior teeth, resulting in difficulty in speech and mastication. The patient presented with the history of smoking 8-10 cigarettes per day, however he had quit smoking for four months at the time of presentation. The patient was a lawyer by profession and hence had the requirement to be able to speak coherently and confidently. The patient accepted that he had been negligent towards his oral hygiene but now is motivated to follow oral hygiene religiously and was seeking the option to retain the natural teeth.

On examination, we observed heavy calculus deposits around lower anterior teeth. Tooth mobility as per Miller's mobility index [12] showed that all incisors were mobile showing grade II mobility with 41 showing grade III mobility. Periodontal charting, peri-apical x-rays and clinical examination classified this case as Stage III grade C periodontitis. After describing the

case details and management options to the patient, the patient consented to go for periodontal splinting once the follow up after supportive periodontal therapy results in stable periodontium and then a later attempt at the gingival phenotype modification for the stability of periodontium. All the case pictures were taken with patient's consent to be reproduced for educational purposes, case documentation and evaluations at the follow up. After meticulous supra and subgingival scaling and polishing (under local infiltration) at the first visit, the patient was kept on follow up of 2 weeks, 4 weeks, 8 weeks and was kept on supportive periodontal therapy (Figure 1). On the fourth visit, periodontal splinting was done on the lower anterior teeth with Ribbond. The area was isolated for the preparation with cotton rolls. A sterilized aluminium foil was used as the measure by tightly adapting it to the teeth. The measured foil was then used as a template for the Ribbond strip. Teeth 33-43 were etched with 37% phosphoric acid for 15 seconds and the etchant was then washed off. After drying, a white frosty appearance was

observed. Bonding agent was then applied on the etched surfaces with the help of a micro brush, air dried and then cured with LED light for 15secs x2. The interproximal areas were blocked with polysiloxane (light body impression material) for stabilization of teeth and blocking out gingival area. The Ribbond strip was carefully held with the special instrument and wetted with resin before being safe to be held with the gloved hand. The excess resin was blotted. A thin layer (approx. 0.5mm) of Ribbond securing composite was placed on the prepared surfaces of the teeth. Holding the Ribbond with the metal plier, it was carefully adapted to the lingual and interproximal surfaces of the teeth following the contour and anatomy (Figure 2). The excess composite was removed and the Ribbond was tack-cured (5 secs per tooth). Flowable composite was then carefully applied to cover all the fibers of the Ribbond and it was thoroughly cured for 30 secs per tooth (Figure 3). Finally followed by occlusion check, finishing and polishing. The patient mentioned that the splint was smooth and comfortable as well as aesthetic.



Figure 1



Figure 2



Figure 3



Figure 4

At 4 months follow up, the patient presented with decreased pocket depth, stabilized dentition and comfortable mastication and speech. At this stage, the patient was scheduled for free gingival graft therapy for phenotype modification (Figure 4).

Discussion

Fiber reinforced resin composite splints are quickly gaining popularity as the material of choice for periodontal splinting. It provides close adaptation to the tooth contours making them failure resistant. They are bondable, repairable, aesthetic and easier and quicker to adapt than the conventional wired splints [11,13]. Periodontal splints are widely accepted and practiced as an adjunctive treatment for tooth mobility [14]. Literature shows that splinting produces high survival rates and favorable periodontal status of the splinted teeth over a considerable follow up [3]. Splinting of the teeth helps in the redistribution

of the forces on stronger teeth, thereby reducing the occlusal load on reduced periodontium. It is also noted that splinting induces bone remodeling process to prevent bone loss [15]. As is noted in the reported case, the literature supports the improved comfort, aesthetics and function of the patient as the splint provided stability to the mobile teeth which will also be beneficial to eventual clinical attachment gain [7,9,10,14]. The most pivotal prerequisite for a periodontal splinting case to be a success is the proper selection of the case. Taking care of the indications and contraindications of the procedure will lead to clinically and functionally favorable outcomes in the long term [6,7]. Similarly, selection of appropriate splinting material favors the outcome too [1,9]. Based on the available data, it can be noted that splinting can be considered as an essential part of periodontal treatment to increase the lifespan of periodontally compromised teeth with extended mobility.

Conclusion

As periodontal infection progresses, tooth mobility is an inevitable consequence of loss of attachment. It affects the patient's ability of speech, mastication and phonetics. Periodontal splints are used in these conditions to alleviate these symptoms while also promoting stability of the periodontium, prevention of bone loss, gain in attachment loss and restoration of function. Although periodontal splinting has had its fair share of criticism in terms of aggravating plaque accumulation and worsening attachment apparatus, the newer materials and technological advancements evade the disadvantages quoted earlier in the literature. To manage and save periodontally mobile teeth, periodontal splint are a proposed adjunctive treatment option.

Author contribution

AH performed the procedure and wrote the manuscript. HRB checked and helped with the manuscript. AK helped in pictorial documentation of the procedure.

Competing interest

The authors declare no competing interest.

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