



Research article

Intracoronar Tooth Splinting Using Fiber-Reinforced Composite and Silicone Palatal Index: A Case Report

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Abstract.

Background: Tooth mobility is a common problem in dentistry and usually occurs due to periodontitis. Mobile tooth can often be treated using dental splinting to avoid extraction. Fiber-reinforced composite is widely used to splint tooth, but it is difficult to be placed neatly and interferes mastication. Nowadays, fiber-reinforced splint is placed using silicone palatal index and planned using wax-up methods.

Objective: To illustrate the features and clinical applications of splinting fiber-reinforced composite using silicone palatal index.

Case Report: An elderly female with significant bone loss on the maxillary central incisor on left side was treated. A die cast was shaped and contoured using wax-up method to adjust a good occlusion with the opposite tooth. The silicone palatal index was made using clear polyvinyl siloxane above the wax-up. A fiber-reinforced splint was placed on the palatal surface of the maxillary anterior teeth from 11 to 23 using silicone palatal index. **Results:** The silicone palatal index ensured predictable final contour and the position of fiber splint. This method provided promising results to achieve good occlusion and masticatory comfort.

Conclusion: Silicone palatal index represents a useful tool for fiber-reinforced splint on maxillary teeth in periodontally compromised patients. Planned occlusion are necessary to reduce trauma occlusion and risk of breakage.

Keywords: chronic periodontitis, intracoronar splint, fiber-reinforced composite, silicone palatal index

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1. Introduction

Various factors are to be considered in splinting maxillary incisors in periodontally compromised patients with elderly age [1-3]. Several methods are currently used to splint both maxillary and mandibular teeth to fix mobile teeth especially in elderly patients [4-9]. With all of the undesirable side effects due to the use of conventional lingually bonded retainer in periodontally elderly patients (bond failure, plaque accumulation, discomfort) splinting maxillary teeth by means of reinforced composites is offer the elective way for long-term esthetic retention [10-11]. Different types of fiber reinforced composite, which have optimal properties of biocompatibility, adhesion, and



esthetics, are available. The aim of this article is to show a new retention system with fiber reinforced composite using silicone palatal index, illustrating its features and clinical application in periodontally compromised patients.

2. Methods

An elderly 80 years old female patient concerning with her tooth 21 mobility and she didn't want to have a tooth extraction. she had done a direct veneer 1 year before to improve the aesthetics of his elongated teeth, but she feels reddish gums and bleeds when brushing her teeth (fig.1). The patient had a bilateral class I malocclusion. At the time of the authors observation, the conditions were compromised, particularly in the tooth 21, with pathologic extrusion because of traumatic occlusion. Based on periapical radiographic examination (fig.2c), it appears that vertical bone loss up to one third apical, accompanied by cervical overhanging restoration of tooth 21. Based on the history, clinical examination, and radiographic feature above, then a diagnosis of chronic periodontitis in teeth 21 was drawn due to plaque and calculus, aggravated by occlusion trauma and restoration of overhanging. This case is planned treatment to eliminating overhanging restorations that cause plaque accumulation, eliminating traumatic occlusion which cause bone loss, stabilizing mobile tooth.

The patient has given consent to publish case reports and treatments that have been carried out, for the benefit of education and scientific development.

The treatment procedure starts after scalling and root planing and patient can clean her teeth and mouth at home, characterized by a plaque index below 10 percent (Figs. 2a,b). The first step is correct the overhanging restoration and traumatic occlusion on tooth number 21 using resin composite. Old composite restorations were cleaned using a round end tip fissure diamond bur and redefine margin preparation for direct veneers were made (fig.3). The gingiva are retracted using a 000-size retraction cord

to obtain the edge of the subgingival restoration then the teeth are formed using a resin composite with smooth embassure to facilitate gingival healing and prevent plaque accumulation (Fig 4). After restoration of the labial part finished, palatal repair is performed to correct the occlusion trauma and attach the splint fiber (figs. 7-12). From the previous chair side, dental impression has been done and waxed up to determine the position and shaped of the expected occlusion (figs.7-8). The results of the wax up are impress using clear vinyl polyxyloxane silicone (VPS) and modification tray (fig.9) which will later be used as a palatal index. Inside the mouth, the preparation of the palatal part is carried out using a egg shaped diamond bur so that the fiber can be

placed intracoronal. Composite resin is placed on the palatal index, and fiber reinforced splint is placed on it from teeth 11 until 23, then the palatal index is attached to the palatal part of the tooth and pressed until it is fully adapted and cured 40 second each tooth. The rest of the composite restoration is trimmed and polished so that it does not cause plaque adhesion. Palatal index helps to get as close as planned and accurate final results (fig.11).



Figure 1: initial clinical picture, there is tooth mobile 21.



Figure 2: a. disclosing gel for education how to clean teeth; 2b. radiographic features of vertical bone loss up to 1/3 of the root and overhanging restoration.



Figure 3: a. close-up view of the initial case; 3b. eliminating overhanging restoration.

3. Discussion

Tooth mobility can be reduced by occlusal adjustment and/ or splinting teeth. Splinting is indicating when increased tooth mobility due to reduced height of periodontal support, is accompanied by chewing discomfort and masticatory dysfunction. From the clinical point of view, the success of supportive periodontal treatment is directly



Figure 4: a. teeth preparation and refine margin; 4b. teeth restoration using resin composite.



Figure 5: frontal view of final restoration after margin and countour correction.



Figure 6: Before and after correction of restoration.



Figure 7: a: Palatal view inadequate restoration; 7b: die cast.

related with personal oral hygiene standard. Due to this reason, periodontal splinting could greatly improve the chewing comfort, oral hygiene, prognosis and outcome for a patient with generalized periodontitis. Another important reason is establishing a stable occlusion that promotes tooth retention and the maintainance of periodontal health. In this study, patients had chronic periodontitis and had undergone non-surgical periodontal treatment and occlusal adjustment where necessary. After initial therapy,

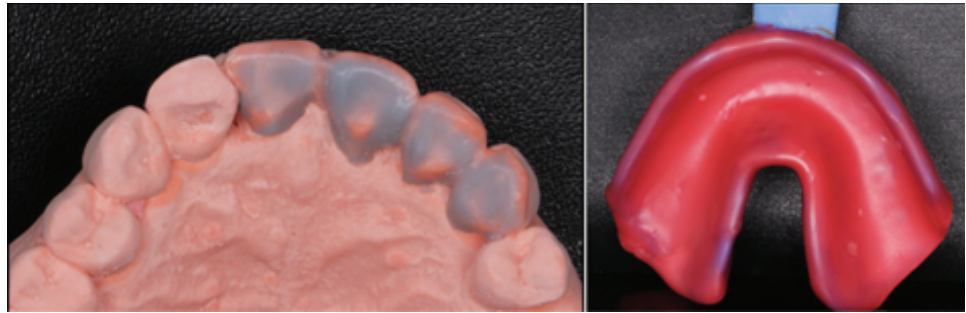


Figure 8: a: wax up to achieve proper countour and occlusion; 8b: tray modification to making silicone index.

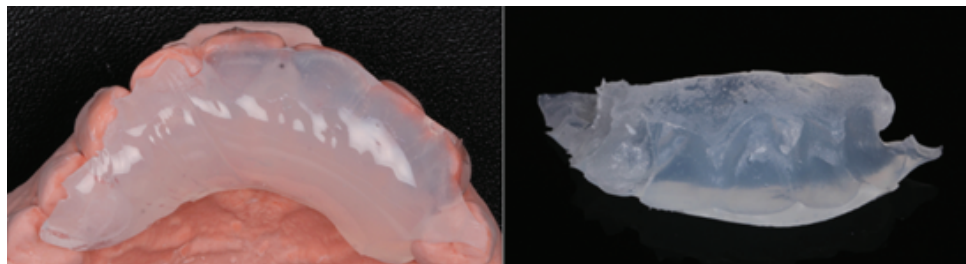


Figure 9: making Polyvinyl Silicone (PVS) Index.

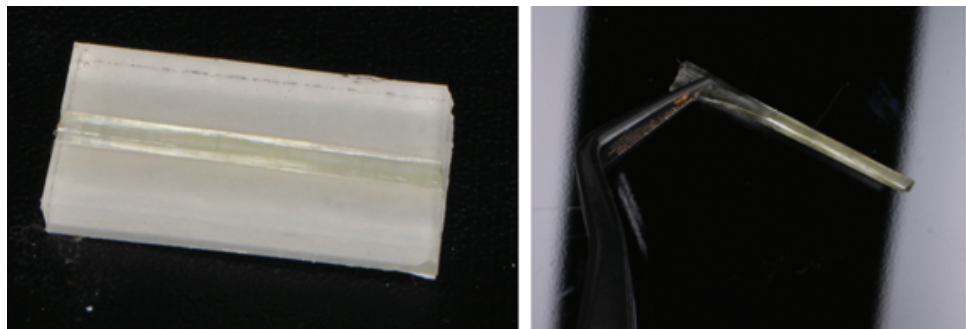


Figure 10: The Fiber splint measured and ready for bonding.



Figure 11: Palatal view final restoration and splint fiber placement.



Figure 12: Compilation of images before and after treatment from various point of view.

patient impaired chewing comfort due to mobility in the maxilla left first incisor. Three teeth support with no mobility was amongst the selection criteria in order to provide a stable construction. Prior to splinting, baseline clinical periodontal parameters were recorded. Results demonstrated that splinting had positive effect on oral hygiene and improved clinical periodontal parameters.

4. Conclusion

splinting using fiber reinforced composite material with the help of the silicone palatal index is very helpful in achieving results in accordance with previous planning. This technique will decrease the risk of splinting breakage because of less thickness structure.

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