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CASE REPORT

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Pink-Splinting Technique to Improve Esthetics and Function in Aggressive Periodontitis

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Abstract

Treatment of teeth with questionable prognosis in aggressive periodontitis is a dilemma for clinicians. These teeth were reported to be preserved for decades without any detrimental effects in dentition but splinting is required in these periodontally involved teeth with pathological mobility to obtain stability and improve function. However, patients' desires for esthetics may not be achieved only with splinting. Thus, we defined a new technique, Pink-splinting, which is a combination of periodontal splinting and gingiva coloured composite materials. In the current case series, this new technique was found to improve both function and esthetics for a 1-year period.

Keywords: *aggressive periodontitis, esthetics, fiber glass, periodontal splinting, tooth mobility*

Introduction

Aggressive periodontitis is a rare inflammatory condition characterized by severe and rapid periodontal breakdown [1]. Because of the aggressive nature of the disease, clinicians generally face with hopeless and questionable prognosis teeth claimed to promote colonization for their neighbours [2]. Thus, extraction of them and reconstructing the dentition either with conventional or implant supported prosthetic rehabilitation were preferred by some clinicians [3]. However, these patients younger than 40 years were reported to desire almost a life-long prosthesis maintained at least 40 years, but this may not always viable. Furthermore, implants in these patients were found to carry 5 times greater risk of implant failure and 14 times greater risk of peri-implantitis development [4]. Extraction of these teeth was also reported to create negative effects in patients with aggressive periodontitis psychologically and functionally. Moreover, even if full mouth extractions, recolonization was still detected in these patients [3]. However, it was reported that 59.5% of hopeless and 88.2% of questionable prognosis teeth survived for 15 years in these patients without any detrimental effects in dentition. Thus, the goal of aggressive periodontitis treatment is suggested to provide a periodontally healthy clinical condition with retaining as many teeth as possible for as long as possible [3].

Periodontally-affected teeth with high mobility need to be stabilized with splinting [5] using glass-fibers as a splinting material can successfully reduce mobility, clinical attachment level and probing depth in periodontally involved teeth [6]. Although functional improvement has been gained with splinting, poor esthetics originating from the interproximal papilla loss is still be a problem. Due to daily social life being influenced by the esthetics after treatment in these patients [3], the aim of this case series was to demonstrate the use of a new technique called Pink-splinting in the treatment of grade II mobile teeth in patients with aggressive periodontitis.

Case report

Case-1

A 37-year-old woman reported to the clinic with a chief complaint of gingival bleeding, tooth mobility, pain during biting, and also discomfort when smiling. The patient without any systemic disease was not a smoker. During the periodontal examination, plaque index (PI), gingival index (GI), probing depth (PD) and clinical attachment level (CAL) were recorded. The clinical examination revealed higher probing depths of 7 to 10 mm circumferentially on the maxillary lateral with class 2 mobility also assessed as non-vital. Radiographic examination showed a generalized periodontal bone loss, especially on the right maxillary lateral tooth. Aggressive periodontitis diagnosis was made according to the radiographic and clinical criteria proposed by the American Academy of Periodontology [1].

Firstly, oral hygiene instructions were provided and scaling and polishing were performed. Seven days later, one-stage full mouth disinfection therapy (OSFMD) was performed [7]. Immediately after, the patient was prescribed amoxicillin and metronidazole (500 mg each) 3 times daily for 7 days. The patient was re-examined at 3 months and, no pathological PD was detected in whole mouth. The patient also reported no discomfort or bleeding, but she still complained about mobility and esthetic discomfort

on the right lateral tooth. Intracoronal splinting was performed by a fiber-glass material (Fiber-Splint, Polydentia, Switzerland). Rubber dam was placed and then anterior maxillary teeth were polished. Then, a preparation was applied to palatal surfaces from the right canine to right central. The surface was then etched and dried. After bonding procedure, fiber wet with bonding agent and, then cut and adapted to the surface between right canine to central and, filled with composite. Then buccal surface management, including incisal embrasures, facial interproximal connector areas and gingival embrasure form were adjusted by using a gingiva-coloured composite material (Gradia GC, Tokyo, Japan) aimed to mimic interproximal tissue. The embrasure form was adjusted to allow for interproximal brushing. The surface was polished with discs and occlusion was also checked. The patient was re-evaluated after 3 months. Self-esteem and well-being without any complaining, including biting was reported by the patient. No plaque accumulation was also detected in maxillary anterior teeth. An interdental papilla loss was also detected in the lower anterior teeth with some calculus accumulation. Patient reported no complaining in this area probably the loss was not located in smile line. Furthermore, she reported to desire the change of the prosthetic restorations in these teeth. Therefore, after the plaque motivation she was directed to the department of prosthodontics.

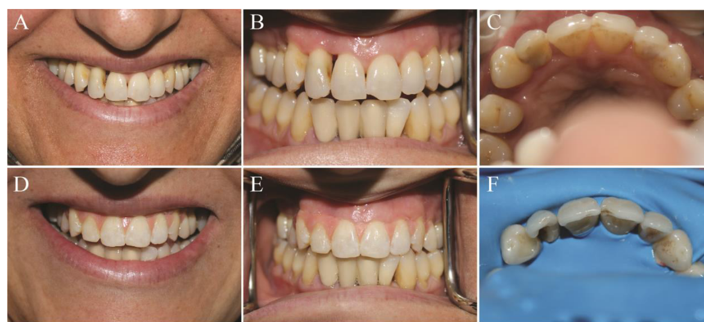

Figure 1. *(A to C) Initial photographs of Case-1. A papilla loss was seen in maxillary right central with mobility II and circumferential pathological PD. Pain and bleeding on brushing were existed on biting in maxillary right central. (E to F) Preparation was applied to palatal surface between right canine to right central and then splinting was performed. Gingiva-coloured composite was applied on vestibular surfaces of maxillary anterior teeth. D) Final appearance after polishing. No black triangles were existed.*

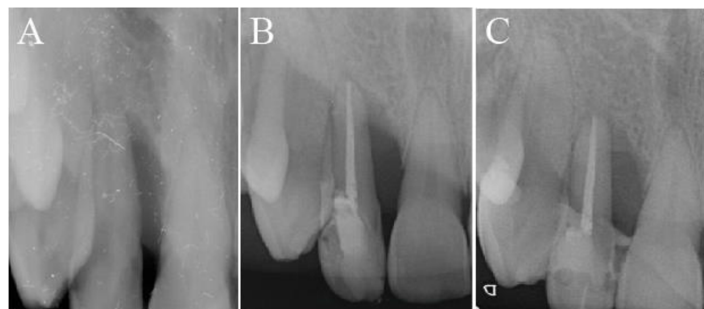

Figure 2. *(A) Initial radiograph of maxillary right lateral assessed as non-vital with mobility II in case-1. B) Root canal treatment was performed immediately after. C) 6 months after pink-splinting procedure. No PD greater than 4 mm was detected without plaque accumulation.*

Case-2

A 34-year-old woman without any systemic disease reported to the clinic with a chief complaint of tooth mobility, pain during biting and also discomfort during smiling. Aggressive periodontitis diagnosis was made and above-mentioned treatment protocols as in case-1 were performed. At 3 months the patient was re-called and no pathological PD was detected. Full arch splinting was performed and, smile adjustment was also created with gingiva-coloured composite. At 1-year re-evaluation, patient reported the positive influence of this procedure psychologically and functionally.

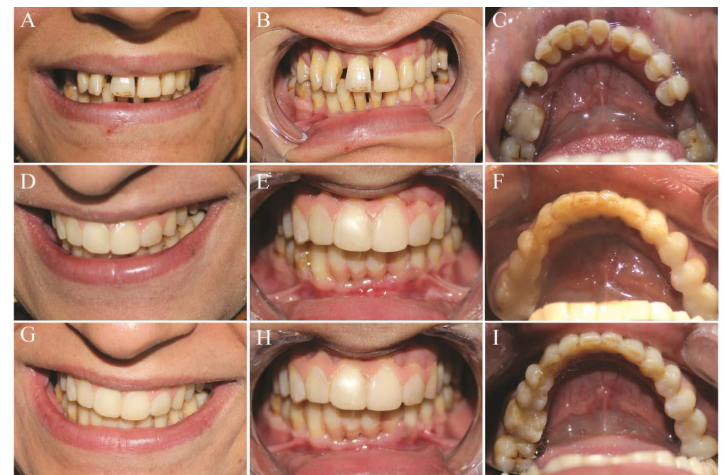

Figure 3. *(A and B) Initial photographs of Case-2. Generalized papilla loss with pathological tooth migration was seen. Pain existed on biting with maxillary and mandibular anterior. (C) Preparation was applied to lingual surface between right second molar to left first molar and splinting was performed. Gingiva-coloured composite was applied on vestibular surfaces of the anterior teeth. (D to F) Final appearance of the patient without black triangles during smiling. (G to H) In 1-year re-call visit no plaque accumulation was seen. Patient also had no complaining both for esthetics and function.*

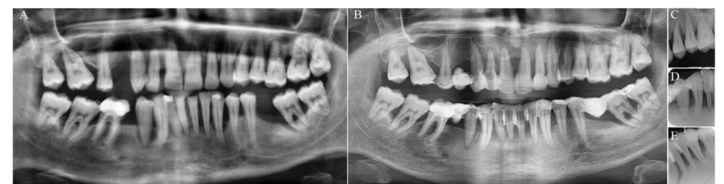

Figure 4. *(A) Initial panoramic radiography of Case-2 showed generalized bone loss. B) Panoramic radiography taken1-year after. C) Periapical radiographs at 1-year visit. No disease progression both clinically and radiographically was detected.*

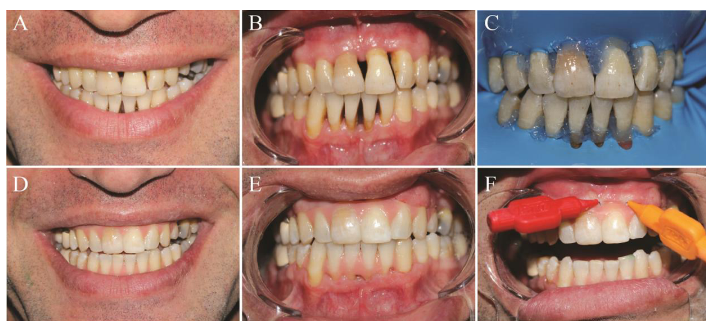

Figure 5. *(A and B) Initial photographs of Case-3. Black triangles with pathological tooth migration was detected. (C) Anterior teeth were etched and dried. After bonding, gingiva-coloured composite was applied on vestibular surfaces of the anterior teeth. (D to F) The embrasure form was adjusted to allow interproximal brushing.*

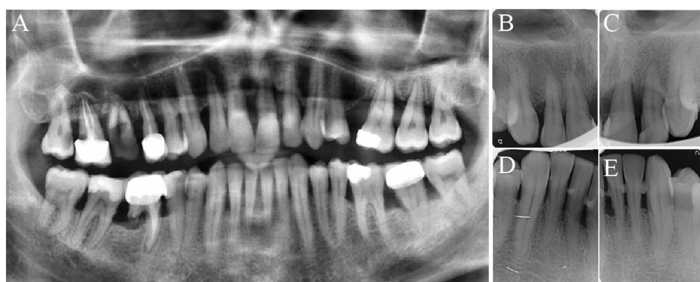

Figure 6. *(A) Baseline panoramic radiography of Case-3 showed generalized bone loss. (B to E) Periapical radiographs were taken in 6 months re-call. No disease progression in teeth restored with gingiva-coloured composites was detected clinically and radiographically.*

Case-3

A 37 years old male without any disease reported to the clinic with a chief complaint of bleeding during brushing and discomfort during smiling. Aggressive periodontitis was diagnosed and; above-mentioned treatment protocols were performed. At 3 months re-call, periodontally healthy condition was detected without mobility. To enhance the esthetics during smiling, pink composite was applied to the buccal surfaces of anterior teeth without splinting. At 6 months recall the patient reported an improvement in his daily social life without any complaining.

Discussion

Hopeless and questionable prognosis teeth are generally a dilemma in clinical practice and, extraction may not be the right treatment option for these teeth in patients with aggressive periodontitis. Thus, the treatment protocol should be a combination of periodontal therapy, occlusal adjustments, and tooth restraints for stability facilitating the reorganization process of periodontium [8]. Recently, these patients have also been seek solutions to improve their esthetics. Thus we defined a new technique called pink-splinting to improve these patients' esthetics affecting the psychology and daily social life of these patients [3].

In this case series, patients affected from aggressive periodontitis differently were treated OSFMD with Pink-splinting. In 6 months, no clinical disease progression nor complaining about esthetics were observed in all patients. In case-1 and case-2, splinting was performed with fiber-glass materials commonly used for their superiorities as to create an environment where tooth movement can be contained within physiological limits whilst restoring function [9] and also adhesion to both composite and teeth [6]. In case-2, full arch splinting used to indicate in extreme situations where extraction and prosthetic treatment are not possible because of patient or site-related factors [10] was performed. After 1-year, clinical attachment gain was observed. Furthermore, the patient reported improvements during biting and chewing with the existence of pink composite during smiling enhancing the patient's self-esteem and psychology. Thus, this technique was found effective in these cases to improve both function and esthetics. However long-term follow-up is needed accepted as a limitation.

Restoration of aesthetics in these patients has been provided by surgical approaches including connective and allogenic tissue graft procedures that were successful when a small volume of tissue needed to be reconstructed. However, these approaches have disadvantages including surgical costs, healing time, discomfort and varying long term results may be found unpopular by clinicians [11]. On the contrary, pink-splinting may be more preferable with superiorities including non-invasive, inexpensive, comfortable.

Previously the gingiva coloured composite in a patient with aggressive periodontitis was used to prevent dark triangles during smiling and beneficial results were reported [11]. A similar beneficial effect of this material on esthetics was also confirmed in case 3. Furthermore, our newly defined pink-splinting technique generated positive results on esthetics and also function in the cases of 1 and 2 up to 1 year.

In patients with aggressive periodontitis the risk factors for disease recurrence or tooth loss were reported as age, educational status, the regularity of maintenance therapy, smoking, high GI and PI [3]. Thus, the success of the treatment depends on the patient motivation and compliance. Before this procedure, these factors should be evaluated.

For long term success in these patients, following any type of restoration including pink-splinting, awareness should be created with the patient for the importance of hygiene and maintenance procedures required for the long-term success. After these types of procedures, creating the gingiva with materials, the first appointment was suggested to be schedule within 3 months [12]. Furthermore, recall visits were suggested to scheduled 3 to 4 times a year [3]. As, these visits may have significance to improve the quality of the treatment.

Conclusion

Pink-splinting can be chosen as a treatment protocol for improving both function and aesthetics affecting daily social life and psychology in patients with aggressive periodontitis.

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