

CASE REPORT

Wire Splinting Treatment in Patient with Localized Chronic Periodontitis: A Case Report

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Abstract

Introduction: Periodontal disease, characterized by inflammation of the tissues surrounding the teeth (such as the gingiva, cementum, alveolar bone, and periodontal ligament), is one of the most common problems. Periodontitis leads to the progressive destruction of the periodontal ligament and alveolar bone. As the disease progresses, attachment loss around the affected teeth, eventually increased tooth mobility. One treatment for stabilizing tooth mobility is splinting. **Case Report:** 37-year-old male patient, complaining of mobility in his lower teeth with multiple diastema. Wire splinting was performed on the patient using 0.3- and 0.4-sized wires from teeth 33 to 43. **Discussion:** Teeth mobility can cause masticatory dysfunction. Splinting preserves mobile teeth and serving as periodontal support. Splinting should leave area around the gingiva clean to avoid plaque accumulation and easy maintenance. **Conclusion:** Splinting in this case report, enabling the teeth to function properly and provide easy maintenance. A follow-up examination is required six months to a year later to assess the improvement of the alveolar bone.

Keywords: Periodontitis, Teeth mobility, splinting

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INTRODUCTION

Periodontitis, a severe form of gingival disease has the prevalence estimated at 61.6%, with its severe stage affecting approximately 24% of the studied population.¹ Periodontitis which is marked by attachment loss and bone destruction, often resulting in tooth mobility. Dental splinting becomes clinically urgent in periodontitis patients to stabilize mobile teeth, prevent further tooth loss, and improve masticatory function. A splint defined as any apparatus, appliance, or device employed to prevent mobility of displacement of fractured or movable parts.²

Studies show that 30-50% of periodontitis patients experience tooth mobility, significantly impacting oral health-related quality of life.³ Without intervention, mobile teeth can exacerbate bone resorption, impair occlusion, and increase the risk of tooth loss, which is associated with reduced nutritional intake and systemic health complication.⁴ Early splinting in advanced periodontitis can enhance periodontal healing and prolong tooth retention, underscoring its therapeutic urgency.

There are various types of splinting materials, which are categorized by their intended use such as wire, fiber-reinforced ribbon, retainer, and welded bands.⁵ In this case, the patient had multiple dental diastema conditions, so wire and composite splinting was used with the Essig technique. Wire and composite splints are the most commonly used type in clinical practice. They are considered flexible when the wire has a diameter of 0.3–0.4 mm.⁶

CASE REPORT

A 37-year-old male complained of excessive dental calculus and loose teeth. He experienced discomfort when biting into food. He had no systemic diseases or allergies. He works as a security guard and smoked five cigarettes per day.

The patient's general condition was good (*compos mentis*). His blood pressure was 118/82 mmHg. An extraoral examination revealed no abnormalities. An intraoral examination revealed multiple diastemas on the anterior teeth and caries on teeth 16, 28, 36, 37, 38, 46, and 47. The patient's had moderate oral hygiene. There were sub gingival calculus in all regions, gingival edema, and generalized bleeding on probing. All teeth are present except for tooth 48 (missing). Gingival recession ranged from 2 to 4 mm in seven teeth, mostly on the anterior mandible. The pocket depth was 2-4 mm in 12 teeth, and the loss of attachment ranged from 3-7 mm in seven teeth (22%). Intraoral patient photos are presented in Fig. 1, and radiographic photos are presented in Fig. 2. The radiographs show localized alveolar bone loss in the anterior region and crater-like bone loss in the left second premolar of the mandible.

The diagnosis was localized chronic periodontitis according to the 1999 periodontal classification or localized periodontitis stage 2, grade B according to the 2018 international workshop periodontal classification. The treatment plan for this patient includes Phase 1 (initial therapy), which involves scaling and restoration of carious teeth. This is followed by an evaluation and maintenance phase. If necessary, this is followed by Phase 2 (surgery) and Phase 3 (rehabilitation) as shown in Fig.3. The patient's general prognosis was good because he was in adult age, systemically healthy and cooperative with treatment. He had no allergies. The local prognosis is moderate due to localized loss of attachment, generalized BOP, and mobility in some teeth. Splinting was performed in strong and healthy teeth 33, 32, 43 as an abutment teeth to support loose teeth 31, 41 and 42 (Fig.4).



Figure 1. Clinical intraoral photos A. Right aspect B. Anterior aspect C. Left aspect D. Occlusal maxilla E. Occlusal mandible



Figure 2. Radiographic picture

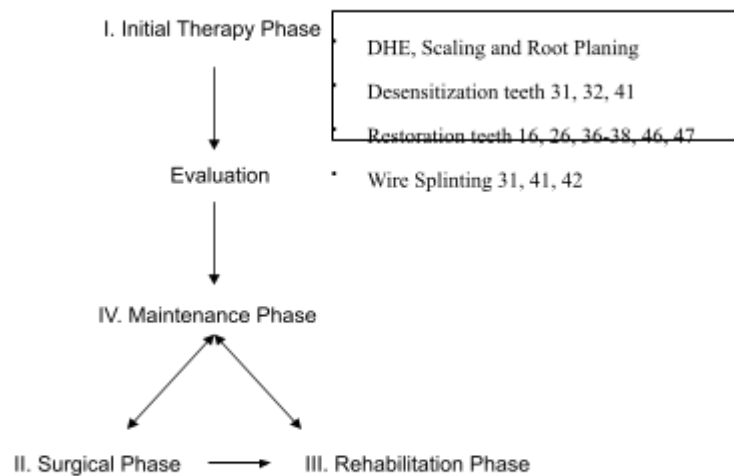


Figure 3. Treatment plan



Figure 5. Clinical picture Before and After Treatment (Left) Before Treatment (Right) After Treatment

DISCUSSION

A 37-year-old male patient came to RSGM YARSI complaining of looseness in his lower teeth. The patient was bothered by this condition and it was known that he smoked five cigarettes per day. After examining the patient with two instruments, grade 1 looseness was found in teeth 31, 41, and 42. During the first visit, scaling and root planning (SRP) were performed to remove all supragingival and subgingival calculus. A week later, a post-SRP check was performed. At this appointment, the patient complained of hypersensitive in teeth 32, 31, and 41 due to exposed roots. Then, desensitization was performed on teeth 32, 31, and 41. Evaluation a week later showed that the patient no longer experienced hypersensitive teeth.

This patient was diagnosed with localized chronic periodontitis caused by plaque and calculus, as her dental involvement was less than 30%. Plaque is a soft deposit that forms a biofilm on the surfaces of teeth and other hard surfaces in the oral cavity. It is classified as either supragingival or subgingival. Bacterial plaque on the tooth surface contains a collection of pathogenic microorganisms, such as *Porphyromonas gingivalis*, *Actinobacillus actinomycetemcomitans*, *Prevotella intermedia*, *Tannerella forsythia*, and *Fusobacterium nucleatum*.⁷ Chronic periodontitis is a periodontal disease. It is a long-lasting inflammatory disease affecting the soft and hard tissues around the teeth, and it is common worldwide. It is associated with biological risk factors, such as high blood pressure, high blood cholesterol, diabetes, genetic factors, and obesity, as well as behavioral risk factors, such as an unhealthy diet, physical inactivity, and tobacco use.⁸

This patient smoked five cigarettes a day, which may have exacerbated their periodontitis. No matter the form, tobacco use is associated with a higher risk of developing more severe periodontal disease. Several studies have shown that the outcomes of nonsurgical and surgical periodontal therapy are worse for smokers than for nonsmokers. It is currently believed that tobacco use increases the risk, pathogenesis, and progression of periodontal disease through several mechanisms: Decreased gingival perfusion, which limits the provision of nutrients and oxygen and the removal of waste products, suppression of immune responses, especially inflammation, suppression of the morphologic and functional recovery of the periodontium, and dysbiosis and increased infectivity of the oral microbiota. These factors combined impair wound healing and accelerate periodontal disease.⁹

Tooth mobility, is a common dental problem that can result in tooth loss due to disease or injury to the gums or the bone that supports the teeth. The degree of tooth mobility is evaluated using the Miller classification, as it is related to treatment options and prognosis. The following are the degrees of tooth unsteadiness based on the Miller classification (1950): (0) no obvious movement; (1) greater than normal unsteadiness; (2) up to 1 mm of unsteadiness in the lingual-buccal direction; and (3) more than 1 mm of unsteadiness in the lingual-buccal direction combined with the ability to compress the teeth. Tooth mobility can cause masticatory

dysfunction and discomfort for patients. Highly mobile teeth tend to indicate a poor prognosis and prone to tooth extraction. However, some cases showed that highly mobile teeth can be preserved and last a long time. Therefore, tooth mobility is not an absolute indication for extraction.^{4,10}

There are two types of splinting based on duration and purpose: temporary splinting, which is used in periodontal treatment for less than six months, and provisional splinting, which is used for stabilization for several months to a year. Both temporary and permanent dental splinting are complementary therapies that cannot cure periodontal disease. However, they can help distribute occlusal pressure over a wider surface area, serving as periodontal support and maintenance. Teeth with a poor prognosis may last longer with splints.^{11,12} The type of splinting treatment for this patient is provisional splinting.

Provisional splinting is used for diagnostic purposes and allows the clinician to monitor the tooth's progress against treatment and determine if a permanent splint is necessary. In cases where tooth mobility interferes with normal function, a splint is necessary to reduce or correct the mobility.³ The healing of inflammation and the enhancement of the alveolar bone will be observed over the course of 6 months to 1 year.

Dental splinting, whether temporary or permanent, is an adjunctive therapy that cannot treat periodontal disease. However, it can help prevent the migration of pathology, maintain teeth in position, and facilitate scaling, curettage, and periodontal surgery. It can also stabilize teeth so that the occlusal load is distributed among several teeth instead of resting on just one.

In this case, splinting treatment was performed using 0.3- and 0.4-mm wires from teeth 33 to 43. The selected abutment teeth were considered postulated that "The total periodontal membrane area of the abutment teeth, must equal or exceed that of teeth to be replaced."⁴ In this case, three strong and healthy teeth 33, 32, 43 function as abutment teeth to support loose teeth 31, 41 and 42. The placing wire on diastema teeth is placed crosswise to get stability. On the teeth with contact points, an additional wire is used in the interdental area, similar to the Essig technique. Follow-up outcomes demonstrate improved periodontal prognosis, reduced mobility and enhanced patient satisfaction.

With proper care, teeth with splinting can last a long time, provided there is no active inflammation. Therefore, splinting should be placed in the coronal third to allow for cleaning of the spaces between the teeth.¹¹ In this case, the placement of the splint, over accessibility of plaque control to avoid plaque accumulation and gingival inflammation. Patients received dental health education to help them maintain the cleanliness of the splint area and the teeth can be retained for a longer period.

CONCLUSION

Periodontitis is a significant public health issue with a high prevalence rate. The progressive loss of attachment around the teeth due to periodontitis can lead to increased tooth mobility and impaired function. Tooth mobility can be treated with dental splinting. Splinting teeth 33-43 with wire and composite provides support and reduces mobility, allowing the teeth to function properly and aesthetically pleasing.

ACKNOWLEDGMENT

We would like to express our sincere gratitude to RSGM YARSI.

CONFLICT OF INTEREST

We declare no conflict of interests

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