

CASE REPORT

Further migration of tooth in patient with reduced periodontium: a case report

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Keywords

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Abstract Pathologic tooth migration (PTM) is a common complication following moderate to severe chronic periodontitis, which lead to the undesirable consequences such as traumatic occlusion and impaired aesthetic appearance. Multidisciplinary approach had been successfully used in overcoming the problem. However, since periodontal tissue support is reduced in PTM, further migration of teeth may occur as they were always subjected to the external forces such as occlusion and soft tissue pressure during function. This case report described a 41 year-old male with a further migration of his upper right central incisor after periodontal therapy. After multidisciplinary approach was carried out to overcome the problem and the tooth was on stable condition, permanent splinting was placed to secure the tooth.

Introduction

The occurrence of Pathologic tooth migration (PTM) among periodontal disease patients were high, ranging from 30 to 56 percent (Brunsvold, 2005, Martinez-Canut *et al.*, 1997, Towfighi *et al.*, 1997). It is also a common complication following moderate to severe chronic periodontitis and more often become the motivation for patients to seek periodontal therapy (Carranza, 2006, Cirelli *et al.*, 2006). PTM which was categorized into diastema, facial flaring, extrusion, rotation and drifting of the teeth (Costa *et al.*, 2004, Towfighi *et al.*, 1997) occurs under conditions that weaken the periodontal support and/or increases the forces exerted on the teeth. The inflammatory destruction of the periodontium in periodontal diseases creates an imbalance between the forces to maintain the tooth in position and the forces that migrates the tooth such as occlusal and soft tissue pressure (Carranza, 2006).

Many reports revealed that spontaneous correction of PTM occurs after conventional periodontal therapy, especially in the case of early to moderate chronic periodontitis (Cirelli *et al.*, 2006, Sato *et al.*,

2004, Singh and Deshpande, 2002). However, in the case of severe chronic periodontitis, spontaneous correction are less likely to occur (Gaumet *et al.*, 1999). As a result the migrated teeth will lead to the undesirable consequences such as traumatic occlusion and impaired the aesthetic appearance. The correction of aesthetic in the case of migrated teeth never been easy and in most cases required interdisciplinary approaches (Maeda *et al.*, 2005).

We encountered a few cases of PTM where further migrations occur after stabilization of periodontal disease, however we could not find any report that described this condition. This case report describes a further migration of the upper right central incisor after stabilization of periodontal disease and how the interdisciplinary approach was carried out to manage the problem.

Case report

A 41-year-old male came to Periodontics Clinic, Hospital Universiti Sains Malaysia complained about his upper right central incisor protruded again after a tooth re-contouring procedure that was carried out about two years ago. Further clinical

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examination revealed no systemic problems.

Dental history revealed that about two years earlier patient was referred to the clinic for bleeding gum and protruded tooth (upper right central incisor). The patient was later diagnosed with generalized moderate to severe chronic periodontitis which was possibly causing to his protruded upper right central incisor (Figure 1). Series of periodontal treatments involving surgical and non surgical procedures were carried out to stabilize the periodontal tissues. Tooth re-contouring procedure was carried out to improve the appearance of his protruded tooth (Figure 2). Patient was placed under maintenance therapy at a four monthly review. However, record showed that patient did not turn up after a third review, before he appeared again one year later with the present complaint.

On clinical examination, the upper right central incisor was found protruded buccally and incisally, thus creating a gap about 2 mm with the adjacent teeth (Figure 3). The pulp sensitivity test suggested the tooth was non-vital. However, periodontal tissue condition was found stable, without pocket more than four millimeters. Oral hygiene was satisfactory and no other pathology noticed.

Treatment options concerning the protruded tooth were presented to patient, and after several considerations concerning advantages, disadvantages, prognosis and cost of the options, patient opted the

following treatment plan for the upper right central incisor: (1) endodontic therapy, (2) realignment of the tooth using orthodontic upper removable appliance (URA), (3) construction of post crown, and (5) tooth splinting.

After endodontic therapy, URA with labial bow as an active component was used for four weeks to bring the tooth as close as possible into teeth alignment (Figure 4), thus closes the gaps. Consequently, construction of post and core was followed, where ParaPost XP™ (Coltene/Whaledent Inc, USA) was used and luted with RelyX Luting Plus Cement (3M ESPE, USA). The core was then built up using LuxaCore Dual (Dental Material Gesellschaft mbH, Hamburg, Germany). Since the tooth was root treated, preparation of a tooth for a crown was more flexible. In this case, more reduction was made on the buccal side of the tooth to allow the crown to be issued in a good teeth alignment (Figure 5). As permanent splinting was planned, design of the crown was made special. Palatal surface of the crown, porcelain fused to metal (PHM) was made pitted to allow for mechanical retention of composite resin in the splinting procedure. Forestaflex® twist-wires (Forestadent, Pforzheim, Germany) was used as a splint, and secured with Filtek z250 (3M ESPE, USA) (Figure 6). Patient was satisfied with the appearance and function even after a year review (Figure 7).



Figure 1 Protruded upper right central incisor.



Figure 2 Re-contouring procedure on upper right central incisor.



Figure 3 Remigration of upper right central incisor.



Figure 4 Orthodontic URA was used to put the upper right central incisor into alignment.



Figure 5 PHM crown issued on the upper right central incisor.



Figure 6 Upper right central incisor secured using permanent splint.



Figure 7 The teeth after a year review.

Discussion

Periodontal bone loss is one of the major factors responsible for PTM. Martinez-Canut and colleagues (1997) studied on 852 private periodontal patients on PTM (where the occurrence of developing diastema was measured). They found that PTM was significantly associated with the amount of bone loss around the teeth. Their result revealed that as the teeth have 25 percent bone loss, they have about 34 percent chances for PTM to occur, and the prevalence of PTM will be increased up to 80 percent if the bone loss reached 50 percent. In another study, Costa and associates (Costa *et al.*, 2004) observed a few types of PTM, which includes extrusion and facial flaring, and interestingly they found that the teeth which are extruded and flaring presented with respectively about 59 percent and 45 percent bone loss. There was other significant study that supports the hypothesis of bone loss causing to PTM. Towfighi and associates (Towfighi *et al.*, 1997) compared the amount of attachment loss (AL) in both control and migrated teeth (PTM), and they found that in all PTM cases (e.g. diastema, extrusion and facial flaring) the attachment loss ($4.79 \pm 0.28\text{mm}$) was significantly greater than the control teeth ($3.21 \pm 0.18\text{mm}$).

Even though, bone loss or attachment loss has been showed to be significantly

associated with PTM, many believed that the etiology is multifactorial. PTM was also reported as having association with factors like occlusion (Craddock and Youngson, 2004, Fujita *et al.*, 2010, Roux *et al.*, 1990), soft tissues pressure (Proffit, 1978), gingival growth (Fu *et al.*, 1997), periodontal tissue inflammation (Emslie, 1976, Hirschfeld, 1933), and habit (Pradeep and Sharma, 2006). In the present case, the tooth (upper right central incisor) had protruded buccally and incisally, thus creating gaps to the adjacent teeth. The chronic periodontitis had resulted in 30 to 50 percent bone loss around the tooth. Based on the clinical radiographic presentation, we believed that the bone loss is the main reason for the occurrence of PTM. However we cannot deny the possible contribution of other factors such as occlusion and soft tissue pressure. Since we cannot restore the missing bone, and we are unable to avoid the effect from occlusion and soft tissue especially during function, further migration of the tooth may occurs. Hence we had decided to secure the tooth by placing a splint.

Fix orthodontic treatment has been successfully used as part of interdisciplinary treatment in the correction of PTM (Maeda *et al.*, 2005), and orthodontic intrusion of periodontally compromised teeth has been reported as effective, as long as light continuous forces are used and an excellence oral hygiene is maintained (Cirelli *et al.*, 2006, Wennstrom *et al.*, 1993). Quite unfortunate for the present case as the patient was not in favor with the unsightly brackets of the fix orthodontics treatment. Thus the UVA was chosen in order to bring the tooth as close as possible into the teeth alignment. Since the tooth (upper right central incisor) was root treated, it gave us an advantage during the crown preparation stage, as the reduction on the buccal surface was overly prepared in order to allow the crown (restoration) to be issued in the best alignment possible. Hence the aesthetic is restored.

Conclusion

In the case of periodontal disease associated PTM, we believed that further migration of the teeth may occur after the stabilization of the disease, especially when the bone loss had exceeded 50 percent. The condition may be due to the reduced amount of periodontium to hold the tooth in place as the teeth were always subjected to the external forces such as occlusal and soft tissue pressure. Hence in treating PTM, a preventive step such as permanent splinting should be considered as part of the treatment procedure.

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