

Case Report

The Role of Occlusal Adjustment on Treatment of Tooth's Mobility: Case Report

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ABSTRACT

Introduction: Periodontal disease and traumatic occlusion can result in loss of alveolar bone so that the teeth become mobile. Treatment of tooth's mobility depends on the etiology and prognosis of the tooth.

Case: This case report describes the treatment of a tooth's mobility due to periodontal disease and traumatic occlusion. The first case was a 39-year-old female patient with complaints of mobility of teeth, the gums of the lower front teeth were often swollen, pus intermittently since 2 years ago. Clinical examination showed tooth 41 mobility grade 2 with a pocket depth of 6 mm and teeth 31,32,42 mobility grade 1 with a pocket depth of 3 mm and were traumatic occlusion on teeth 11,21 and 41. Radiographic showed infrabony defects of teeth 31 and 41 with 30% bone loss. The second case was a 22-year-old female patient with complaints of bleeding gums when brushing her teeth and mobility of lower front teeth since 1 year ago. Clinical examination showed teeth 31,41 mobility grade 2 with a pocket depth of 4 mm and 6 mm, teeth 32,42 mobility grade 1 with a pocket depth of 3 mm, there was traumatic occlusion on teeth 21 and 31. Radiographic showed suprabony defects on teeth 31 and 41 with 30% bone loss.

Case Management: In both cases, initial treatment was carried out with scaling and root planing, followed by occlusal adjustment. One week post-treatment occlusal adjustment there was no tooth mobility in either case.

Discussions: Mobility can be caused by periodontal tissue inflammation, alveolar bone destruction, and traumatic occlusion.

Conclusion: Occlusal adjustment can reduce mobility in traumatic occlusal teeth.

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INTRODUCTION

The occurrence of increased tooth mobility can be caused by many factors. Tooth mobility is caused by damage to the bone that supports the teeth, traumatic occlusion, and the extension of inflammation from the gingiva to the deeper supporting tissues and the pathological process of the jaws often occurs in patients with trauma due to occlusion with chronic periodontitis.¹ Traumatic occlusion is a term used to describe an injury that results in tissue changes in the attachment apparatus, including the periodontal ligament, alveolar bone and cementum, as a result of one or more masticatory forces. Traumatic occlusion can occur in intact periodontal tissue or reduced periodontal tissue due to periodontal disease.²⁻⁶ Clinical signs of traumatic occlusion include progressive tooth loss, tooth mobility, occlusal disharmony, worn tooth, tooth migration, tooth fracture, hypersensitivity, root resorption, cemental tear, and periodontal ligament widening on radiographic examination.^{6,7}

Increased tooth mobility adversely affects function, aesthetics and the patient's comfort.² Tooth mobility is classified into three degrees:^{1,8,9} Grade 1: swaying slightly greater than normal, grade 2: about 1 mm mobility and grade 3: mobility > 1 mm in all directions and/or the tooth can be pressed apically. Diagnosis of the factors causing the occurrence of tooth mobility is needed for successful treatment.¹

Tooth mobility treatment includes a combination of initial treatment with non-surgical and surgical periodontal treatment, occlusal adjustment and splinting.^{8,10} For cases of tooth mobility caused by inflammation accompanied by traumatic occlusion, it can be done to exclude inflammatory factors such as scaling and root planing and occlusal adjustment.¹ Occlusal adjustment treatment is considered an important factor in the overall treatment of periodontal disease as it has been reported to significantly reduce the progression of periodontal disease. Ramfjord and Ash stated that occlusal adjustment is can be to improve occlusal stability in patients with periodontitis.⁸ This case report aims to describe the correction of cases of tooth mobility in mandibular anterior with a mobility grade 1-2

and accompanied by traumatic occlusion with scaling and root planing and occlusal adjustment to improve comfort, function, and aesthetics.

CASE

Case 1

A 39-year-old female patient came with complaints of that his mandibular anterior teeth are mobility, patient felt uncomfortable because of bad breath, the gums of the lower front teeth are often swollen, pus and disappear since 2 years ago. The patient admitted that she had never been treated by a dentist and had a bad habit of using toothpicks. The patient's general medical history was good and did not have any drugs or food allergies.

On extra oral examination there were no abnormalities. Intraoral examination showed a lot of plaque and calculus in the anterior mandibular teeth area with Oral Hygiene Index (OHI) was moderate score. On clinical examination, there was grade 2 mobility on tooth 41 with a pocket depth of 6 mm, and grade 1 mobility on teeth 31,32,42 with a pocket depth of 3 mm. Traumatic occlusion occurred on teeth 11,21 and 41 in the mandibular protrusive position and there was malposition and edentulous (Figure 1). On radiographic examination showed infrabony defects in teeth 31 and 41 with a bone loss percentage of 30% (Figure 2).

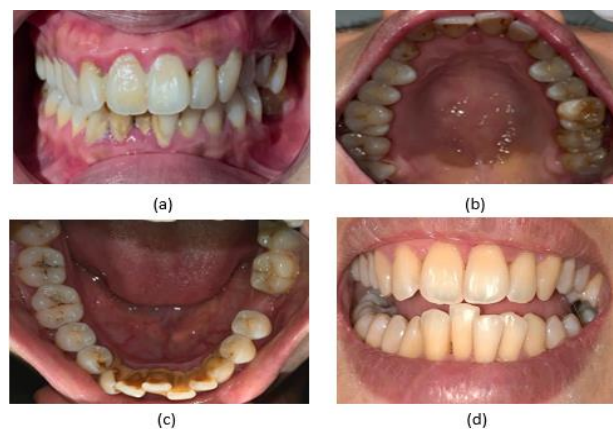


Figure 1. Clinical appearance of the first patient. (a). Anterior labial view; (b). Palatal occlusal view; (c). Lingual occlusal view; (d). Traumatic occlusion in the mandibular protrusive position.



Figure 2. Infrabony defects of teeth 31 and 41

This condition is diagnosed as localized chronic periodontitis (AAP 1999) or Stage III Grade A Periodontitis (AAP 2017), where plaque was the main etiology factor that was exacerbated by the presence of other local factors such as supra and subgingival calculus, traumatic occlusion, malposition, non-replacement of edentulous teeth and poor toothbrushing frequency. Based on the patient's complaints and the clinical examination that has been carried out, in this case the initial treatment is scaling and root planing for removing plaque and calculus, occlusal adjustment on teeth 11,21 and 41 for traumatic occlusion.

Case 2

A 22-year-old female patient with complaints of bleeding gums when brushing teeth and his mandibular anterior teeth have had mobility since 1 year ago. The patient admitted that claimed to be uncomfortable and felt bad breath. The patient's general medical history was good and did not have any drugs or food allergies, but the patient admitted to chewing food on one side 3 months ago.

On extra oral examination, there were no abnormalities. On intraoral examination showed plaque and calculus on the anterior of the mandibula and posterior of the maxilla with with Oral Hygiene Index (OHI) was moderate score. On clinical examination, there was grade 2 mobility on teeth 31,41 with a pocket depth of 4 mm and 6 mm, and grade 1 mobility on teeth 32,42 with a pocket depth of 3 mm. There was traumatic occlusion on teeth 21 and 31 in the mandibular protrusive position, malposition of teeth 31,41, and food retention on teeth 26 and 36 (Figure 3). On radiographic examination showed

suprabony defects in teeth 31 and 41 with a bone loss percentage of 30% (figure 4).



Figure 3. Clinical appearance of the second patient. (a). Anterior labial view; (b). Palatal occlusal view; (c). Lingual occlusal view; (d). Traumatic occlusion in the mandibular protrusive position.



Figure 4. Suprabony defects in teeth 31 and 41.

Based on the patient's complaints, clinical and radiographic examination, a diagnosis and treatment plan are established. This condition is diagnosed as generalized chronic periodontitis (AAP 1999) or Stage III Grade B periodontitis (AAP 2017), where plaque was the main etiology factor compounded by the presence of other local factors such as supra and subgingival calculus, malpositioning and lateral chewing. The action procedure is notified and explained to the patient. After the patient agrees to the action to be taken, the informed consent is signed by the patient as a sign of approval for the action to be taken.

CASE MANAGEMENT

The treatment plan begins with the initial phase then the corrective phase and the maintenance phase. Dental Health Education (DHE), Scaling Root Planing (SRP) and Occlusal Adjustment (OA) in the initial phase. Initial treatment was removing plaque and calculus and smoothing the roots, irrigation with povidone iodine and then giving oral hygiene instructions or Dental Health Education (DHE) to the patient. Control after performed 1 week after SRP, DHE, with OHI was adequate.

Occlusal adjustment was performed on areas where there is premature contact of the mobility teeth. Occlusal adjustment was performed using articulating paper. The patient was instructed to bite the prepared articulating paper on the maxillary and mandibular anterior teeth with movements such as chewing food. After that, the patient was asked to open his mouth, so that the colored part of the tooth surface could be seen and occlusal adjustment would be applied in that site by grinding the surface using a fissure bur or high-speed carbide drill with a spherical-shaped tip. Occlusal adjustment by selective grinding aims to remove of occlusal interference, establishment of a balanced occlusion and to prevent trauma from occlusion does not occurring again. For the first patient, tooth 41 was selective grinding by 2 mm because the tooth was extrusion so desensitization was carried out to avoid hypersensitive dentin. After that, polish the entire tooth surface of the maxillary and mandibular with using a polish bur.

Control was conducted 1 week after the procedure. The patient was instructed to brush his teeth 2 times a day and keep oral hygiene. The second control was carried out at week 3 after the procedure. The patient's OH condition improved, the patient did not complain of pain, and teeth 32, 31, 41, and 42 were not mobility and plaque is more controlled.

DISCUSSIONS

The mechanism cause tooth mobility include inflammatory disruption of the periodontal tissues, alveolar bone loss, and traumatic occlusal. The presence of inflammation caused by microbial plaque combined with

traumatic occlusion leads to rapid periodontal tissue destruction. Trauma from occlusion has been defined as structural and functional changes in the periodontal tissues caused by excessive occlusal forces and distribution the resulting forces. Excessive occlusal load may cause changes in the periodontal ligament, alveolar bone, cementum, and dental pulp.^{2,8,11}

In a healthy periodontium, traumatic occlusion leads to hypermobility of some teeth; if hypermobility, radiological widening of periodontal ligament space or pronounced cervical abfraction is found. In cases of reduced periodontium, increased mobility may also be reduced by occlusal adjustment.² Assessment of tooth mobility is also considered as part of periodontal assessment as it is one of the important signs in the diagnosis of periodontal disease. Therefore, reduction of tooth mobility is one of the main goals of periodontal therapy. The ideal treatment plan for tooth mobility requires knowledge of the etiology of mobility and an understanding of the prognosis. Intraoral clinical examination and radiographs are usually very helpful in determining the etiologic factors.^{8,12}

In both of these case reports, the etiology of the tooth mobility was periodontal disease, namely periodontitis aggravated by traumatic occlusion. The treatment was to eliminate the etiologic factors by performing supra- and subgingival scaling and root planning. Occlusal adjustment was then performed to restore the occlusion function to a harmonious contact relationship. Occlusal adjustment during this initial phase is part of the initial procedure to control periodontal disease which has been considered as part of periodontal therapy.⁵

Removal of plaque, calculus, elimination of deep periodontal pockets and occlusal adjustment are treatment options and result in healthy periodontium. If left untreated, the continuous loss of the supporting tissues during periodontal disease progression may result in increased tooth mobility. Occlusal adjustment is not a substitute for conventional periodontal treatment for resolving plaque-induced inflammation. However, it may be beneficial to perform occlusal adjustment in conjunction with periodontal treatment in the presence of clinical indicators of traumatic occlusal, especially relating

to the patient's comfort and masticatory function. The patient's occlusion should be carefully examined and recorded before and after treatment. The occlusion of periodontally compromised teeth should be designed to reduce the forces to be within the adaptive capabilities of the reduced periodontal attachment. Overall, in the presence of traumatic occlusal, occlusal adjustment may slow the progression of periodontitis and improve the prognosis.

After 1 week of initial treatment, it was found that there was a reduction in tooth mobility from mobility grade 2 to mobility grade 1. At week 3 after occlusal adjustment in both patients, there was no visible mobility, the patients felt comfortable and their oral hygiene conditions were very good. From the clinical appearance, the difference in patient occlusion before and after occlusal adjustment was also seen (Figures 5 and 6).



Figure 5. First patient. (a). Overview of traumatic occlusion after using articulating paper; (b). Clinical appearance before occlusal adjustment on edge to edge position; (c). Clinical appearance after occlusal adjustment on edge to edge position.

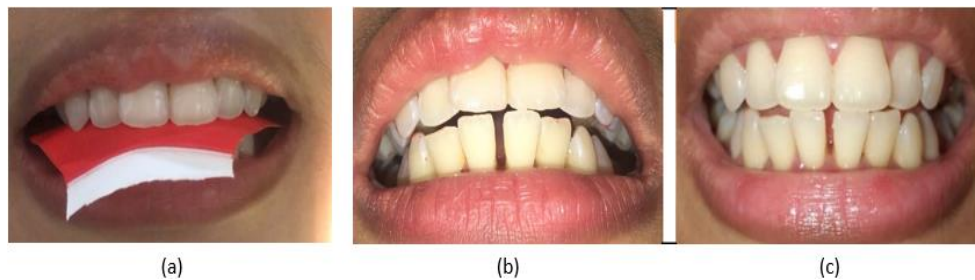


Figure 6. Second patient. (a). OA using articulating paper; (b). Clinical appearance before occlusal adjustment on edge to edge position; (c). Clinical appearance after occlusal adjustment on edge to edge position.

CONCLUSIONS

Mobility can be caused by periodontal disease and traumatic occlusion. Traumatic occlusion does not cause periodontal disease but may cause periodontal tissue loss or aggravate periodontal tissue destruction. Supra and subgingival and root planning can reduce mobility in teeth, but does not eliminate mobility in teeth with traumatic occlusion. Occlusal adjustment are effective for the reduced of mobility caused by periodontal disease accompanied by traumatic occlusion.

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