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Cases of periodontal therapy in need of orthodontic treatment

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Abstract : Periodontal therapy often requires orthodontic treatment in case of diastema and extreme maxillary protrusion associated with severe periodontitis. We report two periodontal cases with orthodontic treatment. Diastema and deep overbite of the first case with moderate periodontitis was improved by orthodontic therapy after periodontal surgery. At first examination, the second case with anterior crossbite seemed to be difficult to preserve the front teeth because of the severe periodontitis. But the crossbite tooth was improved by minor tooth movement after periodontal surgery, and was preserved for about ten years. The malposition of teeth even if with severe periodontitis seemed to improve the occlusion by appropriate orthodontic treatment after periodontal surgery, and to preserve the teeth for a long time.

Key words : periodontitis, diastema, orthodontic treatment.

Introduction

Diastema, deep overbite and extreme maxillary protrusion are often associated with progress of periodontitis. Orthodontic treatments for such cases are important as well as periodontal therapy in order to acquire a good occlusal relationship.

Ramfjord and Ash¹⁾ have described that orthodontic treatment should be completed prior to the periodontal surgery. As main reason for postponing the periodontal surgery until completion of the orthodontic treatment, they mentioned the healing periodontal fibers reoriented to the new tooth position and facility of the retention.

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Fig. 1. Case 1.

a : Intraoral findings at first medical examination.

b : X-ray findings at first medical examination.

c : Intraoral findings at about 5 years after first medical examination.

d : X-ray findings at about 5 years after first medical examination.

Others²⁻⁶⁾ reported inflammatory periodontal diseases must be corrected before orthodontic therapy on the contrary. We report two periodontal cases with orthodontic treatment after periodontal surgery.

Case 1

A 40-year-old female visited our hospital (Dental department of Iwate Medical University Hospital) with main complaints of diastema in an anterior area. Intraoral examination revealed obvious spacing

between the upper incisor teeth (Fig. 1 a), and the probing pocket depth was 6 mm at the mesial deepest site of the incisor with pus discharge. Upper frenulum was one of the disease factors. Radiographic examination revealed alveolar bone resorption induced by periodontitis at proximal sites (Fig. 1 b). Orthodontic treatment was carried out after reevaluation of periodontal flap surgery and frenectomy. Improvement of the diastema, deep overbite and periodontal condition has been kept for about 5 years until now (Fig. 1 c). Alveolar



Fig. 2. Case 2.

a : Intraoral findings at first medical examination.

b : X-ray findings at first medical examination.

c : Intraoral findings at about 10 years after first medical examination.

d : X-ray findings at about 10 years after first medical examination.

bone level was almost same at first medical examination (Fig. 1 d). This patient was satisfied with the therapy.

Case 2

A 39-year-old female with main complaints of teeth mobility in an anterior area visited the hospital about 10 years ago. Intraoral examination did not reveal obvious inflammatory findings in the upper anterior area (Fig. 2 a), but the probing pocket depth was 10mm at the deepest site with pus discharge. Radiographic

examination revealed severe resorption of alveolar bone at the sites (Fig. 2 b). We diagnosed this case as early onset periodontitis (post juvenile periodontitis) because of the disease character and her family and medical history. Immediately, we started periodontal therapy. Initial treatment, periodontal surgery and orthodontic treatment were performed in this patient. Because crossbite and crowding at the anterior areas of this patient were risk factors of periodontitis, so we eliminated the factors after periodontal surgery. Crossbite

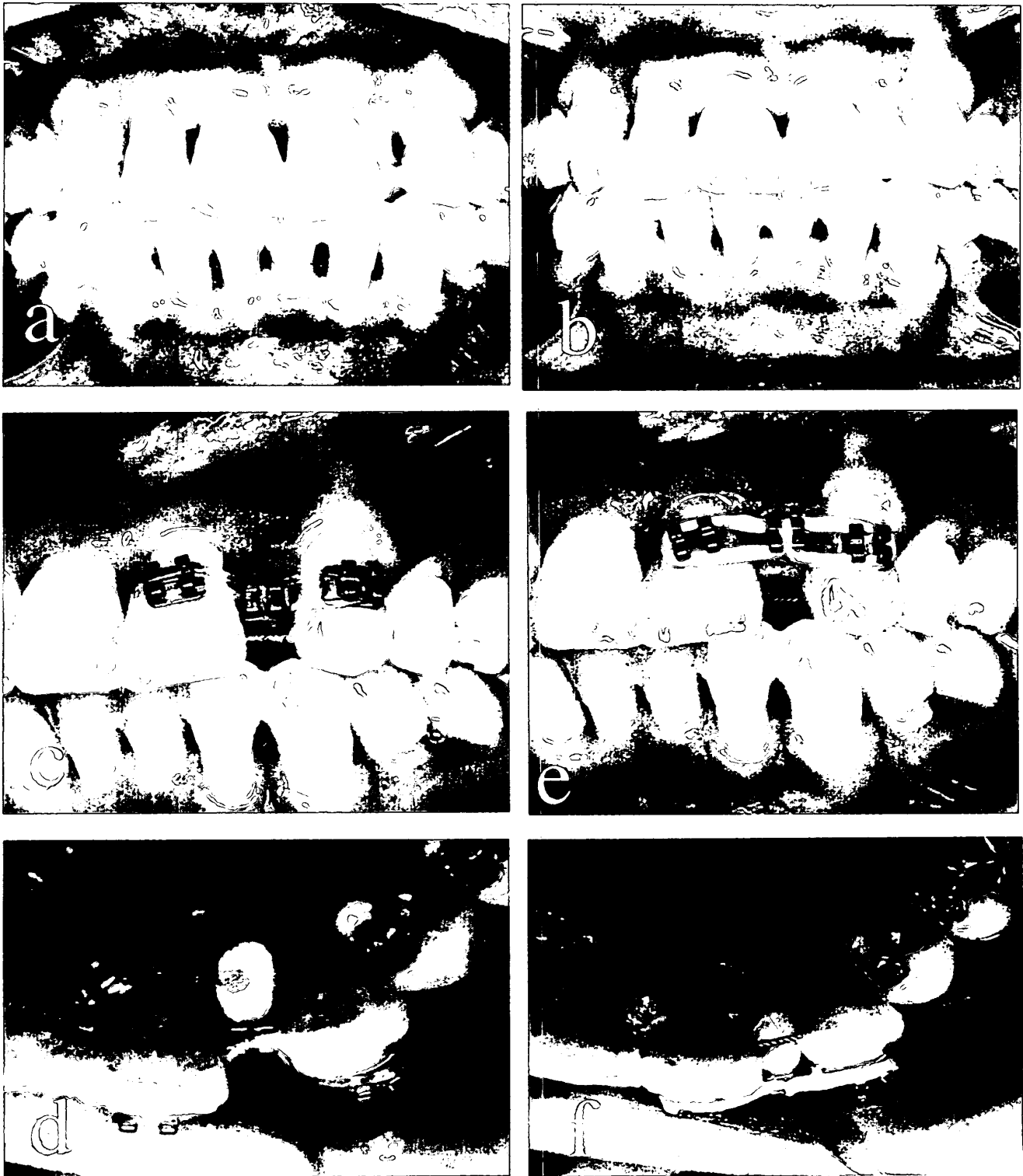


Fig. 3. A tooth movement of case 2.

a : Intraoral findings after periodontal surgery.

b : Temporary fixation after a tooth movement.

c-f : Frontal and occlusal findings during the tooth movement with elastic bands and brackets.

and crowding of upper lateral incisor were improved by the orthodontic treatment, and then the patient got better dentition for the maintenance. Intraoral findings and X-ray

findings at about 10 years after first medical examination were Fig. 2 c and Fig. 2 d. Alveolar bone level of the anterior area partially was improved in comparison with

that of first medical examination (Fig. 2 d).

Periodontal therapy and orthodontic treatment were as follows. Occlusal adjustment, temporary splinting, endodontic treatment, scaling and root planning as initial treatment were done as soon as possible. Periodontal surgery containing apically positioned flap surgery and frenectomy were carried out at the anterior area after reevaluation of initial treatment sites (Fig. 3 a). Orthodontic treatment in detail was performed as follows (Fig. 3 c-f). Bleeding on probing (BOP) and the probing depth of the lateral incisor were confirmed before the treatment. BOP was negative, and the depth was almost 1-2 mm at the site. The tooth was moved by orthodontic elastic band with bracket (Fig. 3 c, e). In order to have anchorage, anterior fixation except for the lateral tooth was done with wire resin splint (Fig. 3 d, f). After the orthodontic treatment, the teeth were both retained and splinted at the same time (Fig. 3 b). The permanent restoration for fixation has not been treated yet because of both the patient's demand and the possibility of the recurrence. The patient was satisfied with the treatment for about 10 years after first examination.

Discussion

A direct relationship between the health of the periodontium and the response of the tissues to orthodontic tooth movement is clear. Orthodontic forces alone will not produce gingivitis and periodontitis in the absence of plaque. However, if bacterial plaque is present when teeth are being moved, alveolar bone resorption and attachment loss can occur. Even if under proper control of inflammation at

periodontal tissue in a patient with periodontitis, orthodontic forces to the teeth with deep pockets often cause severe periodontal destruction locally, and result in failure. In this report, orthodontic treatment was carried out in the teeth without deep pockets after pocket elimination by periodontal surgery.

Ramfjord and Ash¹⁾ recommended that periodontal surgery should be postponed until the completion of orthodontic treatment listing 3 reasons for the treatment turn. On the other hand, Carranza²⁾ advised that orthodontic treatment should not be started until the inflammation of the gingiva has been reduced to a minimum through adequate scaling, root planning, and correcting other irritational factors. In addition, he concluded that the sequence of periodontal and orthodontic procedures should be determined by close consultation between the orthodontist and periodontist.

Geiger and Hirschfeld³⁾ listed 6 prerequisites for selection of cases suitable for minor tooth movement, and they reported as the fifth prerequisite that most periodontal treatment should be completed before movement procedures were started. Wilson and Kornman⁴⁾ advised that, if teeth were moved in the presence of inflammation, increased bone loss could occur compared to cases where inflammation was controlled. And more they reported that free gingival graft might be needed before tooth movement begins. To establish periodontal health first was noted as most important treatment for orthodontic therapy by Kieser⁵⁾. Oikawa⁶⁾ *et al* reported a case of skeletal anterior crossbite with periodontitis in her sixties.

They described that periodontal healthy condition induced by propriate initial treatment led the patient to good results. Orthodontic treatment for the tooth movement requires healthy periodontal ligament cell. Periodontal tissue regeneration⁷⁾ after the periodontal surgery also requires the cell at the same time.

Subgingival scaling and root planning is worth improving shallow pockets of periodontitis. But in deeper pockets, we think that a periodontal flap approach as well as scaling and root planning absolutely needs to prevent bone loss during orthodontic treatment. So periodontal surgery was carried out before orthodontic treatment. First of all in periodontal severe cases, the most important and goal of treatment is to restore health and function and to preserve the teeth for a long time. Orthodontic treatment seemed to be the next step after confirmation of the preservation. In severe periodontal cases with such deep pockets as case 2, just as Carranza²⁾ reported, we think that performing periodontal surgery before orthodontic therapy can ensure more complete elimination of irritants and inflammatory changes, and allow the

patient better access during orthodontic therapy, and finally preserve the teeth for a long time.

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矯正処置を必要とした歯周治療例

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抄録：歯周炎に罹患した症例では歯間離開や上顎前歯部の突出を伴う場合が多く、その歯周治療に矯正処置が欠かせない。我々は矯正処置を必要とした歯周炎患者の2症例を報告する。第一症例は中等度歯周炎に罹患した症例であり、その歯間離開と過蓋咬合が、歯周外科処置後の矯正治療によって改善することが可能だった。第二症例は、初診時点で上下顎前歯部が高度歯周炎に罹患しているために保存困難と思われた症例である。しかし、歯周外科処置と歯の移動による前歯部交叉咬合の改善によって、約10年の長期にわたり保存可能だった。高度歯周炎に罹患し、矯正処置を必要とする歯は、歯周外科後に適切な矯正処置が施されれば、咬合関係を改善して長期にわたり保存することが可能であると思われた。

キーワード：歯周炎, 歯間離開, 矯正処置