Case Report

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Treatment of severe generalized chronic periodontitis in a patient with Behçet's disease: A case report

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Abstract

Behçet's disease is a systemic disorder of unknown etiology. It involves multiple organ systems and is characterized by recurring episodes of oral ulcers as well as ocular, genital, and skin lesions. Oral ulcers can affect tooth brushing and impair proper oral hygiene. As a result, a dental biofilm accumulates, and the condition of the teeth and periodontal tissue deteriorates. The aim of this case report is to highlight the efficacy of periodontal treatment for patients with Behçet's disease. A 51-year-old man with Behçet's disease presented with generalized severe periodontitis. After basic treatment of the periodontal tissues, periodontal surgery was performed at several sites with bony defects. However, the patient developed severe stomatitis in the oral mucosa and gingiva after periodontal surgery. Administration of the antimicrobial agent cefdinir had little effect on recovery; however, subsequent administration of sitafloxacin resulted in significant improvement of the stomatitis. This case demonstrates that periodontal therapy is very useful for alleviating the oral signs and symptoms of Behçet's disease. Systemic antibiotic treatment with sitafloxacin (but not cefdinir) and mechanical debridement were effective in preventing the recurrence of aphthous ulcer outbreaks after periodontal surgery.

Keywords

Behçet's disease, periodontal disease, oral aphthous ulcers, outbreak of stomatitis, periodontal surgery, sitafloxacin

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Introduction

Behçet's disease (BD) is a systemic disorder of unknown etiology. The presentation of BD includes several symptoms of multiple organ disorders and is characterized by recurring episodes of ulcers in the oral and genital regions or skin/ocular lesions such as erythema nodosum and uveitis.[1,2] Several immunological factors have been revealed in patients with BD, and several species of *Streptococcus* and herpes simplex virus-1 have been revealed as triggers of the disease.[3–5]

Early signs of BD primarily arise as ulcers in the oral mucosal tissues. Persistent oral ulcers can cause difficulty with oral hygiene (i.e., tooth brushing) and eating. Several studies have shown that the oral microbiome plays a key role in the pathogenesis of BD and recurrent aphthous stomatitis.[6,7] In some studies, the periodontal index was higher in patients with BD than in healthy controls.[8,9] Recurrent severe and moderate oral ulcers reduce the tooth-brushing time, thereby resulting in high scores for periodontal parameters. Furthermore, the number of oral ulcers and frequency of daily brushing are correlated with the severity of BD.[10] Therefore, treatment and management of periodontitis in patients with BD is essential to eliminate the infectious triggers of the disease.

However, the bacteria responsible for periodontal disease may be associated with the development of BD, and periodontal surgery might promote or aggravate the symptoms. As previously described, oral streptococci induce hypersensitivity of immune responses and the development of BD.[11] This can make the treatment of BD challenging.

This report describes the management of a 51-year-old man with generalized severe periodontitis and BD. This case will help patients, physicians, and dentists in the clinical setting. Periodontal therapy is very useful for alleviating the oral signs and symptoms of BD. In this case, systemic antibiotic treatment with sitafloxacin and mechanical debridement were effective in preventing the recurrence of aphthous ulcer outbreaks after periodontal surgery.

Case report

In June 2011, a 51-year-old man was referred to Keio University Hospital. His chief complaints were swelling in the left maxillary molar region and nasal congestion. The patient had also developed oral aphthous ulcers, skin lesions, and genital ulcers, and his medical history revealed that he had been treated for BD with Chinese herbal medicine at a private dermatology clinic. However, this therapy did not reduce his symptoms.

The clinical oral examination revealed significant accumulation of dental plaque and calculus as well as swelling and redness of the gingiva. We also observed purulent discharge at teeth 13, 12, 11, 21, 24, 25, 26, 27, 46, and 47 (Figure 1(a)). Dental caries and wear of a metal inlay were observed. Deposition of plaque and gingival swelling were found across both dental arches, and aphthous ulcers were present on the tongue and buccal mucosa. The O'Leary plaque control record was 84.6%. The clinical examination also revealed a probing depth (PD) of $\geq$4 mm in 63.5% of all sites and bleeding on probing (BOP) in 69.9% of all teeth. Radiographic examination revealed moderate horizontal alveolar bone loss and localized severe vertical alveolar bone resorption at sites 14 mesial, 23 mesial, 26 mesial, and 45 distal, and a class III furcation defect was noted at teeth 46 and 47 (Figure 1(b)). The patient was diagnosed with extensive severe chronic periodontitis and acute odontogenic sinusitis in the left maxillary sinus (Figure 1(c)).

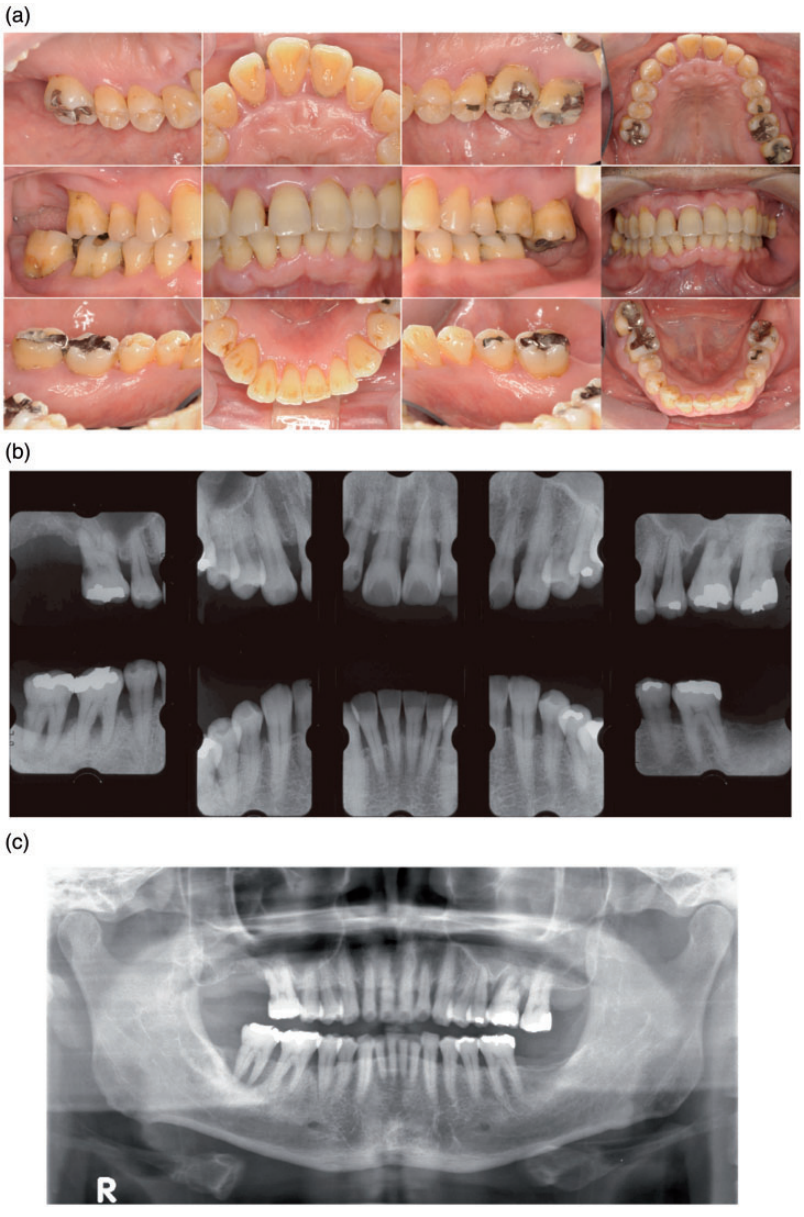

Figure 1. Oral view and radiographic images at baseline. (a) Intraoral images taken at the initial visit. Inflamed gingiva with swelling, redness, and purulent discharge are present due to accumulation of dental biofilm. (b) Radiographic images at the initial visit. Alveolar bone resorption suggests the existence of periodontal disease. (c) First panoramic radiograph in 2011 revealing a radiopacity in the left maxillary sinus.

Before periodontal therapy, we consulted an internal medicine specialist. The patient was diagnosed with BD based on his history of relapsing episodes of oral aphthous ulcers, genital ulcers, and skin lesions and began treatment with colchicine. Colchicine is an anti-inflammatory plant alkaloid that prevents neutrophil

migration by interfering with microtubule formation. A professional plaque-control regimen was implemented, and the patient was instructed in the proper tooth-brushing technique. Quadrant-based scaling and root planing (SRP) was subsequently performed by our team, along with general management by the physician in the Division of Rheumatology of the Department of Internal Medicine. The patient was reevaluated about 4 weeks after SRP. We found that the initial therapy had yielded improvement of the clinical parameters; 22.9% of the teeth had a PD of $\geq$4 mm, and 41.0% had BOP. Upon completion of the initial therapy, the plaque control record decreased to 17.0%. The prognoses for teeth 26 (the cause of the odontogenic maxillary sinusitis) and 47 were extremely poor; therefore, they were extracted. The gingival redness and swelling improved significantly (Figure 2(a)). Radiographic examination clearly showed the lamina dura in the alveolar bone (Figure 2(b)). However, many areas still had periodontal pockets of $\geq$5 mm; therefore, periodontal surgery was planned (teeth 14–16, 13–22, 23–27, and 44–46). After obtaining written informed consent from the patient, regenerative therapy with enamel matrix derivatives (EMDs) was performed (teeth 21, 23, and 45), focusing on sites with two- or

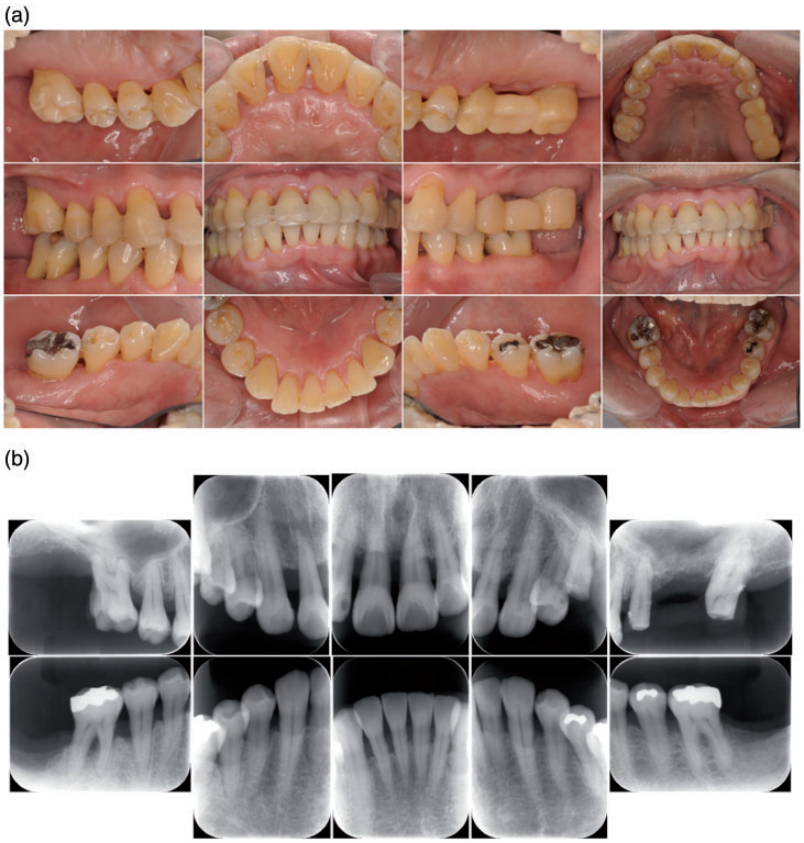

Figure 2. Oral view and radiographic images after basic periodontal treatment. (a) Intraoral images taken after basic periodontal treatment. (b) Radiographic images taken after basic periodontal treatment.

three-wall vertical bony defects. Full-thickness periodontal flaps were used for SRP, and an EMD solution was applied to teeth 21 (Figure 3(a) and (b)), 23 (Figure 3(c) and (d)), and 45 (Figure 3(e) and (f)). After the solution was applied, the flaps were immediately replaced and sutured. The operative sites were stabilized with wire splints directly bonded to the teeth to allow healing. The patient received oral antibiotic medication (cefdinir, 300 mg/day) for 4 days after periodontal surgery (teeth 14–16 and 44–46).

Seven days after the first periodontal surgery (teeth 44–46), an outbreak of stomatitis of the lower and upper oral mucosa was noted (Figure 4(a) and (b)), and the oral odor that often accompanies the presence of anaerobic bacteria was present. An oral antibiotic was administered for 2 weeks until recovery. After the next periodontal surgery (teeth 14–16), the patient developed the same type of oral stomatitis as before, again with the oral odor that often accompanies the presence of anaerobic bacteria. Because the oral antibiotic sitafloxacin (STFX) has good efficacy in the treatment of anaerobic bacteria, the patient received STFX (Gracevit®; Daiichi Sankyo Co., Ltd., Tokyo, Japan) at 50 mg twice daily for 5 days to treat the acute infection. Treatment with STFX showed significant efficacy, eliminating the stomatitis and bacterial odor within only 3 days, and the interference of mastication was resolved. Before the next periodontal surgery (teeth 13–22 and 23–27), the patient received prophylactic STFX preoperatively and developed no recurrence of acute stomatitis.

Reassessment was performed 6 months after the final surgery. Although 4-mm periodontal pockets remained at five sites, the gingival inflammation had resolved. Although we achieved a shallow periodontal pocket and uninfected tissue, the crown–root ratio was inadequate for a stable occlusal position; therefore, a splinted provisional restoration on teeth 13 to 23 was manufactured and fitted to maintain the occlusal position. Final restorations included full-coverage porcelain fused to zirconia splinted crowns on teeth 13 to 23 (Figure 5 (a) and (b)). At the extraction site of tooth 26, we set porcelain fused to a zirconia bridge from teeth 25 to 27. An occlusal appliance (splint) was fabricated to prevent

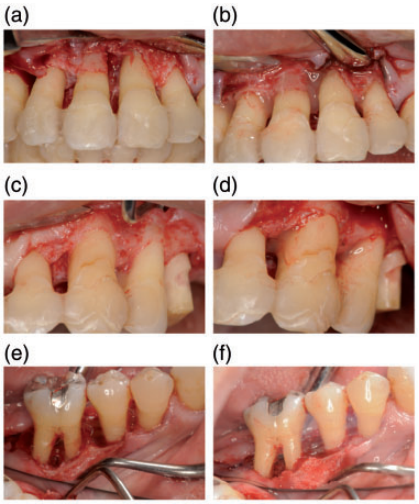

Figure 3. Images taken during regenerative therapy. (a) A two-walled intrabony defect at the mesial aspect of tooth 21. (b) Clinical appearance during surgery with enamel matrix derivatives. (c) A two-walled intrabony defect at the mesial aspect of tooth 23. (d) Clinical appearance during surgery with enamel matrix derivatives. (e) A three-walled intrabony defect at the distal aspect of tooth 45. (f) Clinical appearance during surgery with enamel matrix derivatives.

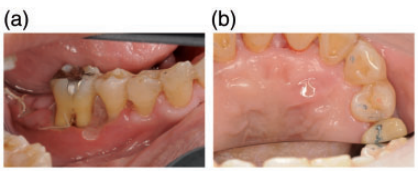

Figure 4. Outbreak of stomatitis. Inflammation is observed in the (a) lower and (b) palatal gingiva after periodontal surgery.

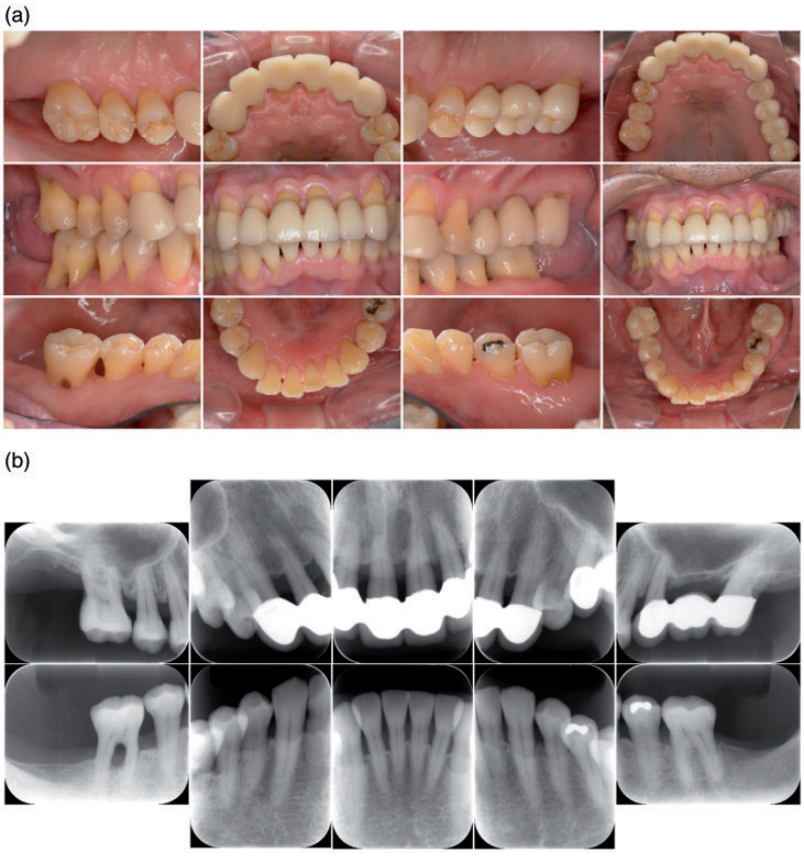

Figure 5. Oral view and radiographic images after supportive periodontal therapy. (a) Intraoral images after supportive periodontal therapy. (b) Radiographic images taken after supportive periodontal therapy.

further occlusal wear and protect the ceramic restorations.

The patient received supportive periodontal therapy for 3 years. Follow-up reevaluation after this period showed a reduction of the mean PD from 4.5 mm at baseline to 2.4 mm, and the number of sites with PDs of $\geq$4 mm decreased from 99 to 4 (tooth 46). In addition, the percentage of sites with BOP decreased from 69.9% at baseline to 9.0%. Three years after regenerative periodontal surgery, the intrabony defects treated with EMDs were radiographically observed in teeth 21 (Figure 6(a)), 23 (Figure 6(b)), and 45 (Figure 6(c)). Compared with the dental radiographic findings from the first visit, the intrabony defect sites were filled with bone, and the alveolar bone line was clearly observed. The number and size of the oral aphthous ulcers had decreased, and they recurred less frequently.

The patient provided written informed consent for publication of this case report and all accompanying images.

Discussion

In this case, we observed two important clinical findings. First, periodontal therapy was very useful for decreasing the oral signs and symptoms of BD and reducing the

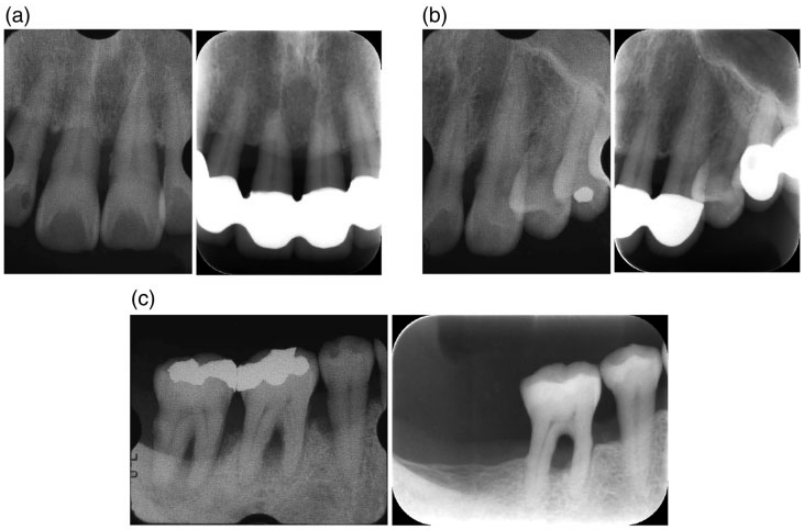

Figure 6. Radiographic images taken 3 years postoperatively. The appearance of the alveolar bone suggests substantial supracrestal attachment apparatus regeneration at teeth (a) 21, (b) 23, and (c) 45.

recurrence of oral ulcers in particular. Second, periodontal surgery may have induced an outbreak of stomatitis of the oral mucosa and gingiva.

The cause of BD is presently unknown. Poor periodontal health is commonly observed in patients with BD.[8] The present case suggests that promptly addressing external factors (caries and severe periodontitis) contributes to alleviation of the oral symptoms of BD. In addition to improving the patient's overall periodontal condition, comprehensive periodontal therapy reduced the size and number of oral aphthous ulcers and decreased the frequency at which they recurred. A previous study determined that oral health was deteriorated in patients with BD and that recurrent aphthous stomatitis occurred more frequently than in healthy controls.[9] Furthermore, Akman et al.[12] suggested that a high Community Periodontal Index of Treatment Needs score was an important risk factor for the development of BD. It is possible that chronic periodontal disease may accelerate BD by promoting a chronic inflammatory response due to bacterial byproducts and any other inflammatory cytokines.[13]

However, periodontal surgery may induce a flare-up of oral ulcers in the mucosa and gingiva. Our patient experienced outbreaks of oral ulceration after both periodontal surgeries despite having taken oral cefdinir prior to surgery. Periodontal surgery may induce the diffusion of periodontal pathogens and lead to a rash of aphthae. Nakajima et al.[14] demonstrated that oral STFX very effectively reduces the number of red complex bacteria; we found that oral STFX treatment not only efficiently eliminated oral stomatitis once it occurred, but administering it before periodontal surgery prevented an acute stomatitis outbreak altogether. Therefore, oral administration of STFX may be very useful for treating a generalized rash of aphthae and acute change of chronic periodontitis in patients with BD.

Additional studies are needed to further investigate the correlations between

periodontal disease and BD. These studies should assess the clinical severity score in patients with BD, assess the levels of pre- and post-treatment pain and functional complications and compare the pre- and post-periodontal treatment oral microbiome using a next-generation sequencer or bacterial examination with real-time polymerase chain reaction. Coit et al.[7] recently showed a significant difference in the salivary microbiome between patients with BD and healthy subjects. In addition, the oral microbiome in patients with BD showed dysbiosis compared with controls, which is consistent with the symptoms of inflammatory bowel disease.[15] Professional periodontal treatment may induce diversity of the oral microbiome. Furthermore, if research of the oral microbiome progresses, analysis of BD- and periodontal disease-specific bacterial flora may reveal evidence to help explain the etiology of recurrent aphthous stomatitis.

We have demonstrated that periodontal therapy is very useful for decreasing the oral signs and symptoms of BD, especially the recurrence of oral ulcers. However, periodontal surgery may induce an outbreak of stomatitis in the oral mucosa and gingiva. Prophylactic oral administration of STFX before surgery may be very useful for preventing these outbreaks. Disinfection of the periodontal biofilm may be associated with the improvement of systemic disease. Further studies are required to clarify the relationship between periodontal disease and BD. Determining the composition of the oral microbiome both during active periodontitis and after periodontal treatment may help to determine whether a core network of bacteria associated with BD and periodontal disease exists.

Authors' contributions

S.M. and S.A. treated the patient and drafted the manuscript. T.O. helped to draft the manuscript. N.H., K.T., and T.N. critically revised the manuscript for important intellectual content. All authors read and approved the final manuscript.

Declaration of conflicting interests

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