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Case Report

Nonsurgical Recovery of Interdental Papillae under Supportive Periodontal Therapy

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Abstract

We observed nonsurgical improvement of interdental papillae in a patient undergoing supportive periodontal therapy. The patient was a 47-year-old Japanese man presenting with widespread gingival recession at Daniele's papilla presence index level 3 and Miller Class I recession affecting the facial aspect of tooth number 42. Initial periodontal therapy for periodontitis was performed, included oral hygiene instruction, scaling and root planing, resulting in a reduction in inflammation. Use of an interdental brush was then suspended to allow the interdental papillae to recover. The type of toothbrush and tooth brushing method were checked repeatedly. Mechanical debridement was performed every 2 to 3 months. A gradual improvement was observed in recession of the interdental papillae over a period of several years together with coronal regrowth of the gingival margin.

Key words: Nonsurgical—Interdental papillae—Supportive periodontal therapy

Introduction

The most frequent etiologic factors associated with gingival recession are malpositioned teeth and trauma inflicted by toothbrushing⁸⁾. Nonsurgical approaches to treating gingival recession of interdental papillae include correction of traumatic oral hygiene methods, restorative treatment, the orthodontic approach and repeated curettage of the papilla¹³⁾. To the best of our knowledge, however, only a few reports have shown recovery

of the interdental papillae by a nonsurgical method, and in those cases the recovery occurred during initial periodontal therapy¹⁷⁾ and without periodic curettage^{14,18)}.

In terms of recession on the labial surface, several reports have demonstrated successful root coverage resulting from non-surgical therapy^{1–3,12,13,15)}. Agudio *et al.*¹⁾ reported a case of slight recession on the labial surface of the upper left central incisor due to incorrect brushing in which the gingival margin showed recovery after correction of brushing



Fig. 1 Front view

A: At initial visit, inflammation and widespread recession was observed in interdental papillae together with Miller Class I gingival recession at facial tooth #42. B: After 2 years of traditional treatment, SPT was initiated. As inflammation of gingiva was reduced in most regions, swelling in gingival margins was also reduced. C: 4 years after first visit. D: 6 years after first visit, improved gingival inflammation and gradually improving recession of interdental papillae were observed together with coronal regrowth in gingival margin.

technique. Ando *et al.*³⁾ reported a 28-year-old woman in whom nonsurgical improvement of multiple facial gingival recessions was achieved by supportive periodontal therapy (SPT).

Here, we report recovery in the interdental papillae and labial gingival regrowth due to adjustment of brushing technique under SPT.

Case Report

In November 2004, a 47-year-old Japanese man visited the dental office of a bank in Kanagawa, Japan. His chief request was removal of dental calculus. His medical history showed no previous treatment for major diseases. He had been smoking 20 cigarettes a day since he was 20 years old. He had previously undergone treatment for dental caries, bridgework for missing teeth and removal of dental calculus. However, he had never been instructed in proper tooth brushing methods

by a dentist or dental hygienist. Moderate inflammation was noted around nearly the entire gingival margin of all the teeth. His gingival biotype was thick-flat. Both third molars and the lower left first molar were missing. Probing depth ranged from 1 to 5 mm and was particularly severe (4 to 5) in the molars. Miller Class I gingival recession¹¹⁾ was observed in facial tooth number 42. Moreover, widespread interdental papilla recession at Daniele's papilla presence index level 3⁵⁾ was observed (Fig. 1A). Moderate horizontal bone defects were revealed by a dental radiograph (Fig. 2) of the molar region, but there were no bone defects in the central incisor region. The plaque control record (PCR) was 70.4% and bleeding on probing (BOP) was 17.3% at the first periodontal examination. Moderate chronic periodontitis was diagnosed. The treatment plan was as follows: oral hygiene instruction, scaling, root planing, smoking cessation program, and maintenance or SPT.



Fig. 2 Dental X-ray at first visit

Moderate horizontal bone defects were apparent in molar region, but no bone defects in central incisor region.

Initial periodontal therapy for periodontitis was performed, including oral hygiene instruction, scaling and root planing. The patient had been brushing his upper and lower teeth simultaneously. He was brushing twice a day, before breakfast and before going to bed. He brushed his teeth forcefully using a hard-bristled toothbrush. Therefore, we had the patient change to a medium-bristled toothbrush (#200 Butler, Sunster Inc., Osaka, Japan) and instructed him to brush the upper and lower teeth separately. The patient was given corrective instruction in the Bass technique for brushing on the labial and lingual sides as well as Charter's method for the interdental area. Furthermore, he was shown how to use an interdental brush and instructed to clean the interdental regions once a day. Scaling and root planing work were performed over the course of several sessions, using both ultrasonic and hand scalers. Bite adjustment was performed on tooth #42. A smoking cessation program was recommended, but the patient chose not to participate. Upon re-evaluation after initial treatment, his PCR was still 39.8% and probing depth was still 4 mm in the interdental region of the upper molars. Slight inflam-

mation remained in several regions. Tooth brushing instruction, scaling and root planing were performed again.

The patient was too busy to visit the dental office more than once or twice a month. After the initial treatment, root canal therapy was performed on tooth number 12 and dental caries treatment on tooth #34. Upon re-examination, the PCR was 23.1% and BOP was 3.7%. As inflammation of the gingiva was reduced in most regions, swelling in the gingival margin was also reduced. Therefore, at this point, we transitioned to SPT, with recall every 2 to 3 months (Fig. 1B). Usage of the interdental brush was suspended to allow the interdental papillae to recover. The interdental region was brushed using only a toothbrush, inserting the tips of the bristle into the interdental region as deeply as possible. Under SPT, the type of toothbrush and method of tooth brushing were checked repeatedly. Mechanical debridement was performed with a universal tip and polishing at slow speed with a rubber cup and prophylaxis paste. Over a period of 4–6 years, the gingival inflammation and recession of interdental papillae gradually improved, and the gingival margins showed coronal regrowth. The reces-

sion at tooth #42 recovered by 1 mm under SPT (Figs. 1C, 1D).

Discussion

Gorman⁷⁾ found that the frequency of gingival recession increased with age and was greater in males than in females of the same age. Malpositioned teeth and toothbrush trauma were found to be the most frequent etiologic factors associated with gingival recession. Recession associated with labially positioned teeth occurred in 40% of patients 16 to 25 years old, and increased to 80% of patients in the 36- to 86-year-old group. In addition, Khocht *et al.*⁸⁾ showed that recession of the interdental papillae might be related to use of a hard toothbrush. The present case of recession was diagnosed as resulting from inflammation and trauma due to tooth brushing. Malpositioning of tooth #42 was also an influencing factor in the recession. Before treatment, it is important to instruct patients in the use of proper brushing techniques in order to ensure that the oral hygiene procedures themselves do not injure the gingival margin¹⁾.

Effective management of the interdental papillae by periodic curettage of the papilla was reported by Shapiro¹⁸⁾, who demonstrated two cases of regeneration of the interdental papillae using this method. In these cases there were gingival deformities caused by acute necrotizing ulcerative gingivitis. After initial treatment of the two patients, women aged 27 and 25, gingival curettage was performed every 10 days a total of 4 times. Ricci¹⁵⁾ also reported three successful cases using this method: one patient of undetermined age in whom treatment was performed in the mandibular incisor area; a 16-year-old girl in whom treatment was performed in the anterior region; and a 15-year-old girl in whom treatment was performed around the maxillary left lateral incisor. These latter two patients were younger than our patient, so the papillae would have re-grown more easily. In spite of the age of the present patient, however,

regrowth of the interdental papillae was seen after correction of tooth brushing technique and SPT with no periodic curettage.

Suspending use of an interdental brush is one key to achieving recovery of the interdental papillae. Sato¹⁷⁾ suspended use of an interdental brush after periodontal re-evaluation. In the present case, it was suspended after commencement of SPT. Regrowth of interdental papillae may require a reduction in inflammation and injury caused by use of an interdental brush.

Miller¹¹⁾ developed a classification system for marginal tissue recession. In order to evaluate the effectiveness of surgical grafting techniques, he categorized recession into 4 classes based on the possibility of root coverage. Many cases have been reported in which Class I recession was improved by a nonsurgical approach. Ando *et al.*³⁾ reported a case in which multiple facial gingival recession was nonsurgically improved by SPT. The patient, a 28-year-old woman, presented for treatment of widespread facial gingival recession ranging from 1 to 4 mm in the incisors and premolars. Nonsurgical periodontal therapy was performed, including oral hygiene instruction, scaling and root planing. After periodic maintenance visits, gradual improvement as measured by a coronal increase in the gingival margin was noted.

Aimetti *et al.*²⁾ compared two different methods of root surface treatment, root planing and polishing versus polishing alone in terms of root coverage. Polishing prevents further progression of gingival recession, while the reduction of root convexity by scaling and root planing promotes a coronal shift of the gingival margin. They concluded that Miller Class I shallow recession may be successfully treated by a nonsurgical approach.

Another factor that may influence gingival regrowth is the periodontal biotype. Sanavi *et al.*¹⁶⁾ proposed two gingival biotypes; thick-flat and thin-scalloped. The biotype of the patient in this current study was thick-flat, which does not recede as easily as the thin-scalloped type. Aimetti *et al.*²⁾ suggested that gingival thickness plays an important role in

the potential for coronal migration of the gingival margin. The biotype in the present study, therefore, may have been more conducive to regeneration than the other type.

The patient in this study had been a smoker for 27 years, which may explain why there was a low percentage of sites with BOP at the initial examination, even though the PCR was high. Bergström and Preber⁴⁾ suggested that inflammatory gingival response to plaque accumulation, such as bleeding, redness and exudation, is suppressed by cigarette smoking. Periodontal healing function is poor in smokers^{9,14)}. This may have affected the amount of time required for improvement in gingival recession.

In the present study, regrowth of the gingival margin was observed under SPT. "Creeping attachment" was first reported by Goldman *et al.*⁶⁾ after gingival grafts. Matter¹⁰⁾ also reported "creeping attachment" in cases of free gingival grafts, concluding that regrowth does not always achieve complete coverage of the recession and is not always predictable. The mechanism by which creeping occurs remains to be clarified.

Conclusion

In the present case, re-growth of the gingiva probably occurred due to natural healing processes after inflammation had been reduced and the cause of gingival injury removed. Taken together with those of the earlier reports described above, the present results suggest that corrective brushing instruction and periodic SPT can result in gingival regrowth without resorting to surgical procedures, even in middle-aged patients.

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