Periodontist-Dental Hygienist Collaboration in Periodontal Care for Chronic Periodontitis: An 11-year Case Report

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Received 26 September, 2016/Accepted for publication 1 November, 2016

Abstract

We report a case of severe chronic periodontitis treated and longitudinally maintained by a periodontist and dental hygienists. The patient was a 45-year-old woman who presented with the chief complaint of gingival bleeding and tooth mobility. An initial examination revealed generalized gingival inflammation and subgingival calculus in the premolar and molar regions. Premature contact was observed in #14 and 45. Clinical examination revealed 42% of sites with a probing depth (PD) of ≥4 mm and 44% of sites with bleeding on probing. Radiographic examination revealed vertical bone resorption in #35, 36, and 45, and horizontal bone resorption in other regions. Based on a clinical diagnosis of severe chronic periodontitis, initial periodontal therapy consisting of plaque control, scaling and root planing, and removal of an ill-fitting prosthesis was performed. Following suppression of inflammation, occlusal adjustment of premature contact sites was performed. Open flap debridement was performed for teeth with a PD of ≥5 mm. After confirming the stability of the periodontal tissue, final prostheses were placed on #16, 35–37, and 46. Following re-evaluation, the patient was placed on supportive periodontal therapy. It has been 11 years since the patient’s first visit, and the periodontal conditions have remained stable. Meticulous periodontal care maintained over a number of years by a periodontist and dental hygienist have yielded a clinically favorable outcome.

Key words: Chronic periodontitis — Plaque control — Supportive periodontal therapy — Collaboration — Dental hygienist
Introduction

The purpose of periodontal treatment is to remove bacterial plaque, the cause of periodontal disease, and control risk factors which influence disease progression. Meanwhile, maintenance or supportive periodontal therapy (SPT) is needed to preserve good periodontal conditions, which is where the specialized knowledge and skills of the dental hygienist play an important role.

Failure to provide adequate maintenance care following active periodontal treatment has been shown to increase the risk of deepening of periodontal pockets and loss of attachment\(^3\). Appropriate SPT, however, can sustain the effects of surgical or non-surgical periodontal therapy\(^8,13,22\). Regular maintenance by dental hygienists can prevent tooth loss\(^20\) and recurrence of periodontitis\(^6\). Axelsson and Lindhe\(^2\) demonstrated that regular instruction and practice in oral hygiene techniques and oral prophylaxis prevented progression of periodontal disease, whereas traditional dental care without such a program did not.

Here, we present a case of chronic periodontitis in which treatment was provided by a periodontist and a dental hygienist. The importance of regular maintenance care is discussed.

Case Presentation

Written informed consent was obtained from the patient for inclusion in this case report.

1. Baseline examination

In September 2005, a 45-year-old woman was referred to the Clinic of Conservative Dentistry at Tokyo Dental College Chiba Hospital with the chief complaint of gingival bleeding during brushing and tooth mobility. The patient, a former smoker, had a history of bronchial asthma. Although she had previously been treated for dental caries, she had no experience of periodontal treatment.

A visual examination revealed general gin-
gival inflammation and calculus (Fig. 1). An ill-fitting prosthesis was found in tooth #36, which also showed distal inclination. An interproximal gap was present between #35 and 36. The guiding teeth were #13–17 and 43–47 for right lateral movement, and #23–27 and 33–37 for left movement. Premature contact was observed in #14 and 45.

The results of periodontal examination at baseline are shown in Fig. 2. Mean probing depth (PD) was 3.7 mm. Forty-one percent of sites showed a PD of 4–6 mm and 1% a PD of ≥7 mm. Bleeding on probing (BOP) was observed in 44% of sites. Tooth mobility was observed in some premolar-molar regions. Degree I furcation involvement was found in #36. The level of plaque control as assessed according to the O’Leary Plaque Control Record (PCR) was 64%. Radiographic examination (Fig. 3) revealed generalized horizontal and vertical bone loss in #35, 36, and 45. Deep caries was observed in #16 and 46.

2. Diagnosis
The clinical diagnosis was severe chronic periodontitis. A treatment plan was presented to the patient and her consent to the proposed plan obtained.

Clinical Procedures and Outcomes
An outline of the treatment process is shown in Table 1.

1. Initial periodontal therapy
Initial periodontal therapy mainly consisted of increasing patient motivation with respect to proper periodontal care, which
comprised tooth brushing instruction (TBI) employing the scrubbing method and quadrant scaling and root planing (SRP) as performed by a dental hygienist. After removing the ill-fitting prosthesis from #36, a provisional restoration was placed. Occlusal adjustment was implemented in #14 and 45. During initial periodontal therapy, TBI focusing on the use of an interdental brush was given by the dental hygienist.

At re-evaluation, the patient’s plaque control score showed an improvement, from 64 to 17%. The mean PD showed a reduction, from 3.7 to 3.3 mm. The mean BOP also showed a reduction, from 44 to 25%.

### Table 1  Treatment process

<table>
<thead>
<tr>
<th>Month</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 2005</td>
<td>Initial periodontal therapy</td>
</tr>
<tr>
<td></td>
<td>· Plaque control</td>
</tr>
<tr>
<td></td>
<td>· Quadrant SRP</td>
</tr>
<tr>
<td></td>
<td>· Removal of prosthesis (#36)</td>
</tr>
<tr>
<td></td>
<td>· Occlusal adjustment (#14, 45)</td>
</tr>
<tr>
<td>December 2005</td>
<td>(Reevaluation) Surgical periodontal therapy</td>
</tr>
<tr>
<td></td>
<td>· Open flap debridement (#13–17, 23–27, 35, 36, 44–47)</td>
</tr>
<tr>
<td></td>
<td>· Odontoplasty (#46)</td>
</tr>
<tr>
<td>July 2006</td>
<td>(Reevaluation) Treatment for recovery of oral function</td>
</tr>
<tr>
<td></td>
<td>· Crown restoration (#16, 46)</td>
</tr>
<tr>
<td></td>
<td>· Cantilever bridge (#35–37)</td>
</tr>
<tr>
<td>December 2006</td>
<td>(Reevaluation) Supportive periodontal therapy</td>
</tr>
<tr>
<td>to present</td>
<td>· Oral hygiene instruction</td>
</tr>
<tr>
<td></td>
<td>· Professional mechanical tooth cleaning</td>
</tr>
</tbody>
</table>

SRP: scaling and root planing

**Fig. 4** During open flap debridement for (a) #35, 36, (b) #44–47
2. Periodontal surgery

After obtaining informed consent, open flap debridement was performed in #15–17, 23–27, 35, 36, and 44–47 (Fig. 4). During surgery, odontoplasty was performed on #46 to remove an enamel projection. The remaining sites with a PD of ≥4 mm received re-SRP. A dental hygienist assisted the patient with post-operative plaque control.

3. Treatment for recovery of oral function

At this point, #16 and 46 were treated for caries, which extended beyond the initial gingival margin. As a result of re-evaluation at 4 months after periodontal surgery, prosthodontic treatment was performed on #16, 35–37, and 46.

4. Supportive periodontal therapy

At re-evaluation, gingival inflammation showed an improvement (Fig. 5). Sites with a
PD of 4 mm were found in #17, 45, and 47 (Fig. 6). The values for PCR and BOP were 19 and 0%, respectively, indicating an improvement. Radiographic examination revealed a general improvement in bone level (Fig. 7). Therefore, periodontal status was judged to be stable and the patient placed in a recall system for SPT.

According to Periodontal Risk Assessment, the risk at SPT was determined to be moderate. The recall interval was set to every 3 months as #36 still had furcation involvement. At each recall visit, oral hygiene instruction was given and professional mechanical tooth cleaning (PMTC) performed by a dental hygienist. At 10 years after the start of SPT, the level of plaque control remained favorable (Fig. 8), and sites with recurrence of periodontal pocket received re-SRP. In some teeth (#14–16, 26, and 27), tooth mobility showed a transient increase due to clenching. This was subsequently improved, however, by application of the autosuggestion method.

At the latest recall examination, the periodontal condition remains stable (Fig. 9). Although some sites showed a PD of ≥4 mm (they subsequently received re-SRP), the mean PD value was 2.2 mm and PCR score 23% (Fig. 10). The bone level has remained stable (Fig. 11). Efforts were made during SPT to maintain patient motivation with regard to plaque control. The occurrence of clenching was carefully monitored by interview. When clenching was identified, autosuggestion was used to control it.

**Discussion**

At the time of her initial visit, the patient had received treatment for caries, but none for periodontal problems. Therefore, a periodontist and dental hygienist spent a lot of time attempting to increase her motivation to undergo periodontal treatment and maintain good periodontal conditions. This was achieved by providing careful explanations supported by oral photographs and other visual materials. Given that she was a former smoker, the risk of smoking for the progression of periodontal disease was also explained. The dental hygienist played a significant role in providing this instruction.

The ill-fitting prosthesis on #36 was part of
the primary reason for plaque accumulation and occlusal trauma. Traumatic occlusion of a tooth already affected by periodontitis promotes destruction of periodontal tissue\(^{11}\). Therefore, the prosthesis was removed and replaced with a provisional restoration at an early stage in the course of treatment. As a result, tooth mobility showed an improvement, making it easier for the patient to brush around that area. A slight increase in plaque accumulation was observed in the interdental area after SRP due to regression of the gingiva. It has been shown that inflammation in periodontal tissue will not improve without an adequate level of plaque control, even after SRP\(^{14}\). Therefore, in the present patient, the dental hygienist recommended the use of an appropriate interdental brush in addition to a standard toothbrush after careful evaluation of the size of the interdental spaces. We believe that this contributed to the observed improvement in PCR and BOP.
Open flap debridement was performed at sites with a PD of $\geq 5 \text{ mm}$. Vertical bone loss in # 35 and 36 was observed in the baseline radiographs. Following surgery, however, the bone level was observed to have improved and was accompanied by flattening. A slight increase was noted in the patient’s PCR at the postoperative re-evaluation. If a good level of plaque control is not achieved, one cannot expect an improvement in periodontal conditions after any kind of periodontal surgery$^{18,19}$. Therefore, here, the dental hygienist assisted the patient with improvement of postoperative plaque control.

After confirming an improvement in the condition of the periodontal tissue, crown restorations were placed on #16 and 46. A cantilever bridge was placed on #35–37 to prevent extrusion of #27. To obtain long-term success in a bridge with a cantilever, it is favorable to have abutment teeth that are vital, because they have lower risk of fracture$^{23}$. It is also important to maintain a good level of plaque control$^{17}$. In the present patient, also, furcation involvement remained in #36. It has been shown that molars with furcation involvement are at higher risk of eventual loss during SPT$^{5,15}$, indicating the need to carefully monitor such sites for potential development of caries or progression of periodontitis.

In their 5-year follow-up study of the relationship between attachment loss and level of plaque control, Lindhe et al.$^{12}$ found that level of oral hygiene affected the long-term outcome of aggressive periodontal treatment. Cases where patient self-care was difficult have shown that professional care by a dental hygienist is even more important$^4$. In the current case, the dental hygienists provided thorough oral hygiene instruction and PMTC. As a result, the patient’s PCR has been well maintained for 10 years from the start of SPT. However, in the last recall visit, we identified some sites which had a PD of 4 mm and which were BOP-positive. Being BOP-negative is a reliable indicator of the stability of a site with regard to progression of periodontal breakdown$^{7,9}$. Here, re-SRP was implemented and further oral hygiene instruction given, focusing on cleaning of the interdental area.

Having the patient perform self-care, especially plaque control, is of paramount importance in achieving an optimal clinical outcome following periodontal treatment. Adequate levels of plaque control and patient motivation are also essential for the long-term maintenance of treatment effects. Toward this end, mutual trust among the patient, the periodontist, and the dental hygienist is critical. In the present case, a team effort in treatment yielded a marked improvement in the patient’s level of plaque control (from 64 to
12%). Both subjective and objective information obtained from the patient was always shared between the periodontist and the dental hygienist. Wilson reported that the patient’s compliance with periodontal treatment is important in maintaining good periodontal conditions. Therefore, here, a constant effort was made to maintain a good level of communication aimed at achieving patient satisfaction with the results. As a result, the patient’s level of interest in oral conditions and understanding of periodontal treatment appeared to increase, which may have subsequently contributed to her long-term compliance with plaque control.

To maintain good periodontal conditions over the long-term, it is necessary to address a variety of risk factors for recurrence of periodontal disease, including those related to age, systemic disease, lifestyle, and diet. Continuously striving to foster mutual understanding among the patient, the periodontist, and the dental hygienist is key in achieving successful maintenance.

Conflict of Interest

We report no conflict of interest with regard to this case report.

References

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