Improvement in Oral Health-related Quality of Life by Periodontal Treatment: A Case Report on Elderly Patient with Chronic Periodontitis

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Abstract

We report a case of an elderly patient with chronic periodontitis requiring periodontal surgery. An 86-year-old man presented to Tokyo Dental College Suidobashi Hospital with the chief complaint of tooth fracture in the anterior region and occlusal pain in the posterior region. Clinical examination revealed 47% of sites with a probing depth (PD) of ≥4 mm and 47% of sites with bleeding on probing. Radiographic examination revealed generalized moderate horizontal bone loss with localized vertical defects. A clinical diagnosis of moderate chronic periodontitis was made. The patient’s oral health-related quality of life (QoL) was also assessed at the time of each periodontal assessment. Initial periodontal therapy was provided followed by periodontal surgery. Open flap debridement was performed at sites with a PD of ≥5 mm (teeth #15–17). Surgical crown lengthening with an apically positioned flap was performed on #11 and 13 to gain an adequate biological width for the subsequent crown restoration. After confirming the stability of the periodontal tissue, provisional restorations were replaced with final restorations. No further deterioration was observed in the periodontal condition during the subsequent 1-year period of supportive periodontal therapy. Oral health-related QoL was markedly improved by the periodontal therapy. This suggests that periodontal therapy plays an important role in improving and maintaining oral health-related QoL in elderly people.

Key words: Periodontitis — Oral health-related quality of life — Elderly people — Periodontal surgery

Introduction

The average number of teeth in elderly people in Japan continues to increase, reflecting a growing awareness of the importance of oral care¹. On the other hand, the ratio of people with periodontitis has also increased in this particular group. Aging is a risk factor for periodontitis⁵⁻⁶. Aging alone, however, does not lead to a loss of periodontal sup-
and appropriate oral care will help maintain the health of such tissue. Elderly people requiring periodontal treatment may also have systemic disease, which will also require careful assessment in choosing the most appropriate course of action.

Periodontal therapy will not only affect various purely periodontal parameters, but also improve the patient’s oral health-related quality of life (QoL). A number of studies, including some from the present group, have investigated the effects of periodontal therapy on oral health-related QoL.2,10,13

The concept of patient-reported outcome measurement, including oral health-related QoL, is becoming increasingly important in periodontal treatment. However, the relationship between periodontal therapy and QoL in elderly people is poorly understood.

In the present report, we describe a case of an 86-year-old man with chronic periodontitis and hypertension. The effects of periodontal treatment including surgical intervention on periodontal condition and oral health-related QoL are discussed.

Case Presentation

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

1. Baseline examination

In September 2013, an 86-year-old man visited Tokyo Dental College Suidobashi Hospital with the chief complaint of tooth fracture in the anterior region and occlusal pain in the posterior region (Fig. 1). The patient had had hypertension for over 10 years, and his blood pressure was 175/94 (Grade: 2).16 He had also had aspiration pneumonia in 2011.

Clinical examination (Fig. 2) revealed 47% of sites with a probing depth (PD) of ≥4 mm and 47% of sites positive for bleeding on probing (BOP). Sites with a PD of ≥6 mm were observed in #14, 17, 23, 25, and 36. Pathological tooth mobility was observed in

![Oral view at baseline](image)
some of the anterior teeth. Radiographic examination (Fig. 3) revealed generalized moderate horizontal bone loss with localized vertical defects. Caries in #13 and 42 extended to the alveolar bone, and that in #11, 31, and 41 to the pulp cavity. The status of plaque control as assessed according to the O’Leary Plaque Control Record was 50%.

In terms of occlusal guidance, lateral movement indicated group function, and balanced-contact interference was observed. A parafunctional habit inducing protrusion was observed in the early stage of closing movement, resulting in premature contact in the anterior teeth.

The patient’s oral health-related QoL was assessed using an oral health-related QoL instrument (OHRQL). The OHRQL scores were recorded at the time of each periodontal evaluation (at baseline, at least 3 weeks after initial therapy, at 3–4 months after surgery, at the start of supportive periodontal therapy (SPT), and during SPT), in reference to our previous reports. At the baseline examination, relatively high OHRQL scores were observed in the subscale items of pain, dry mouth, and eating/chewing function, indicating that these were the elements of QoL compromised (Fig. 4).

2. Diagnosis

The clinical diagnosis was moderate chronic periodontitis. A treatment plan was presented to the patient and his consent to the proposed plan obtained.
Clinical Procedures and Outcomes

1. Initial periodontal therapy

Initial periodontal therapy consisted mainly of tooth brushing instruction (Bass method), quadrant-based scaling and root planing (SRP), root canal treatment (#11, 13, 31, and 41) and tooth extraction (#42, due to tooth fracture). After careful assessment of the perio-endo lesion in the mesial root of #36, hemisection was chosen. Provisional restorations were placed on #11–13, 35–36, and 31–43. Furthermore, an attempt was made to control parafunctional habit by providing guidance toward the proper habitual closing path.

At reevaluation, the plaque control score showed an improvement to 17%. The prevalence of BOP was reduced from 47 to 5%. Swelling and reddening of the gingiva were greatly improved, and the mean PD was reduced from 3.6 to 3.0 mm. Assessment of oral health-related QoL following initial periodontal therapy revealed a reduction in the baseline total OHRQL score of from 21 to 4.

2. Periodontal surgery

After consultation with the patient’s physician, a flap operation was performed, focusing on sites with a PD of ≥5 mm (teeth #15–17) (Fig. 5). Although PD values in #11 and 13 were reduced to ≤3 mm after initial periodontal therapy, few intact tooth structures were observed supragingivally (Fig. 6a).

Therefore, surgical crown lengthening with an apically positioned flap was performed to recover appropriate biologic width for the subsequent crown restoration. A partial-thickness periodontal flap was extended beyond the mucogingival junction. The bone was removed so that a width of approximately 4 mm could be obtained between the restorative margin and the crest of the alveolar bone (Fig. 6b). The flap was then repositioned apically and sutured (Fig. 6c). Blood pressure and SpO₂ were constantly monitored during all surgical procedures.

In other sites with a PD of 4 mm, SRP was repeated.

3. Treatment for recovery of oral function

At 6 months postoperatively, fixed bridges (#11–13, 35–36, and 31–43) were placed after confirmation of function and cleansability with provisional restorations (Fig. 6d).

4. Supportive periodontal therapy

At reevaluation, periodontal status was judged to be stable, and the patient was placed on a recall system for SPT. According to Periodontal Risk Assessment⁷, the risk at SPT was determined to be low. Over the last 12 months, from the start of SPT, the condition of the periodontal tissue has remained stable (Figs. 7–9).

Figure 10 shows change in the total OHRQL scores during treatment. The total OHRQL
score has remained low during SPT (at 18 months from start of SPT).

**Discussion**

The mobility observed in the anterior teeth in the present patient was believed to be due to inflammation of periodontal tissue and
premature contact. An increase in occlusal force may accelerate attachment loss in the presence of gingival inflammation\(^9\). Thus, it appears likely that the premature contact observed in the anterior region here was a result of occlusal pain in #36, which had a perio-endo lesion. Therefore, hemisection was performed at an early stage and a provi-
sional restoration placed to restore occlusal stability.

Because of the patient’s age and systemic condition (hypertension), periodontal surgery was only implemented after careful consideration. The results of reevaluation showed that the periodontal surgeries had yielded clinically favorable results. Gingival inflammation had improved, and the number of sites with a PD of ≥4 mm had been reduced. The periodontal condition of those teeth with subgingival caries and limited biological width also showed an improvement after crown lengthening with an apically positioned flap.

The biomedical data obtained during reevaluation, including periodontal parameters, showed clinically satisfactory outcomes. However, the question remained as to how the patient himself perceived his condition and the treatment performed. One study found that subjective health was a better predictor of longevity than objective health\(^8\). Taking this into consideration, we decided to include assessment of oral health-related QoL as part of periodontal treatment\(^{10,13,14}\). In the present case, the OHRQL score showed a marked improvement after initial periodontal therapy. This finding is consistent with those of our earlier reports\(^{10,13,14}\). We believe that the eradication of occlusal pain and treatment of tooth fracture contributed to this improvement. In addition to addressing the patient’s chief complaint, initial periodontal treatment had a positive effect on the oral environment. The subsequent improvement in periodontal parameters resulting in better scores for “dry mouth” and “psychological function”. Surgical procedures also improved the OHRQL score, with this score remaining stable during SPT.

Many factors need to be taken into consideration when planning periodontal treatment in an elderly patient, including the presence of systemic disease and individual host healing responses, for example. Aging provokes a markedly detrimental effect on wound healing in a variety of tissues, including periodontium\(^{15}\). Table 1 shows examples from a number of patients we have treated as evaluated in terms of periodontal parameters and oral health-related QoL. Even from such a small number of cases, it can be seen that the various procedures used improved periodontal parameters and oral health-related QoL. Even though the background and severity of periodontitis differed in these elderly patients. Taken together, these data suggest that periodontal therapy including periodontal surgery can improve both periodontal conditions and oral-health related QoL in elderly patients with systemic conditions. However, much remains to be learned concerning the impact of periodontal treatment on elderly patients.

<table>
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<tr>
<th>Patient no.</th>
<th>Age (years)</th>
<th>Sex</th>
<th>Systemic disease</th>
<th>Surgery</th>
<th>Mean PD (mm)</th>
<th>Sites with PD≥4 mm (%)</th>
<th>Total OHRQL score</th>
</tr>
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<tr>
<td>#1</td>
<td>86</td>
<td>male</td>
<td>Hypertension</td>
<td>Apically positioned flap</td>
<td>3.6</td>
<td>2.2 0 47 0</td>
<td>21 1</td>
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<tr>
<td>#2</td>
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<td>Rheumatism</td>
<td>Modified Widman flap</td>
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<td>2.7 3 79 3</td>
<td>31 10</td>
</tr>
<tr>
<td>#3</td>
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<td>female</td>
<td>Osteoporosis</td>
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<td>3.7</td>
<td>2.8 5 56 5</td>
<td>14 5</td>
</tr>
<tr>
<td>#4</td>
<td>82</td>
<td>female</td>
<td>Hypertension</td>
<td>—</td>
<td>3.6</td>
<td>2.7 4 53 4</td>
<td>11 2</td>
</tr>
</tbody>
</table>

PD: probing depth, SPT: supportive periodontal therapy

Table 1 Example cases of elderly with compromised systemic condition: evaluation of periodontal parameters and oral health-related QoL.
In summary, improvements in periodontal parameters and oral health-related QoL were noted following periodontal therapy in this elderly patient with hypertension. The patient’s periodontal condition and oral health-related QoL will continue to be carefully monitored.

References


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