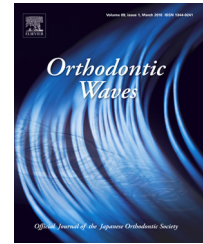


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Original article

## Questionnaire investigation after orthodontic treatment in patients with unilateral cleft lip and palate: An inter-clinic collaborative study

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### ABSTRACT

**Purpose:** This six-clinic collaborative study collected patient opinions after orthodontic treatment, for quality improvement.

**Materials and methods:** Participants comprised 477 patients with unilateral cleft lip and palate (UCLP) who had undergone orthodontic treatment at orthodontic clinics in five university hospitals and one private office in Japan. The questionnaire sent to patients contained 33 questions in five categories, about the respondent, before, during and after orthodontic treatment, and overall treatment. Questionnaires were returned by mail anonymously.

**Results:** Responses were received from 183 patients (response rate, 38.4%). Patients tended to anticipate esthetic improvements in anterior teeth and facial appearance, and reported great improvements with orthodontic treatment. Masticatory problems also improved and orthodontic treatment had positive effects on speech. Almost all respondents were satisfied with orthodontic treatment. Problems with overall treatment were long treatment period, difficulty attending clinics and maintenance of oral hygiene during treatment.

**Conclusion:** This study clarified the subjective effects and problems with orthodontic treatment in patients with UCLP in Japan. Satisfaction after treatment was high. Anticipated esthetic improvement was accomplished and masticatory problems improved. Orthodontic treatment also positively affected speech. Efficient orthodontic treatment to minimize treatment duration and improved treatment systems for easier access are needed to reduce patient burdens in Japan.

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## 1. Introduction

To improve treatment for patients with cleft lip and palate (CLP), evaluation of treatment outcomes is essential. The World Health Organization (WHO) pointed out the need for reducing the burden on the patient and recommended inter-center collaborative studies of treatment outcomes [1,2]. Studies of outcomes in patients with CLP can be divided into two major categories of subjective and objective studies. Many objective inter-center collaborative studies on the treatment outcomes of primary surgeries have been reported [3-9]. Major concerns of these studies have included facial form, occlusion, nasolabial appearance, and speech. As for subjective studies, major concerns have been patient satisfaction and health-related quality of life (QOL), as investigated by either interview or questionnaire [6,10-16].

Concerning the outcomes of orthodontic treatment in patients with CLP, several studies have investigated occlusion after treatment [17,18]. However, information about subjectively evaluated outcomes and problems during treatment from the perspective of patients is lacking. Given this background, we conducted a questionnaire investigation of orthodontic treatment in patients with unilateral CLP (UCLP) as an inter-clinic collaborative study in order to accumulate information for improving treatment.

## 2. Materials and methods

### 2.1. Subjects

This study involved 477 patients with UCLP who had undergone and completed orthodontic treatment in six orthodontic clinics in Japan: University of Tokyo Hospital (UTH), Tokyo; Niigata University, Niigata; Tohoku University Hospital, Sendai; Tokyo Dental College, Chiba; Matsumoto Dental University, Shiojiri; and Ishiwata Orthodontic Clinic, Ebina. Multi-bracket appliance treatment was indicated in all patients and completed before the survey. Questionnaires were sent out by mail and collected anonymously in each clinic. Answers were entered into Microsoft Excel spreadsheets and sent to UTH. Data from the six clinics were combined and analyzed in UTH. This study was approved by the institutional review board of the University of Tokyo.

### 2.2. Questionnaire

A Japanese questionnaire adopted in a previous study was used [19]. English translations of the questions are shown with the results (Tables 1-5). The questionnaire comprised 33 questions in five categories: about respondents, about before, during and after orthodontic treatment, and about the overall treatment. Questions about grafting and alveolar bone orthognathic surgeries were also included. Answers were selected from 2 to 5 choices and space was provided for additional comments for each question, if desired.

**Table 1 – Questions about respondents.**

| Questionnaire                 | Variables  | Respondents (n=183) |
|-------------------------------|------------|---------------------|
| Q1. What is your gender?      | Male       | n=78                |
|                               | Female     | n=103               |
|                               | Unknown    | n=2                 |
| Q2. What is your current age? | 15-19years | n=31                |
|                               | 20-24years | n=53                |
|                               | 25-29years | n=46                |
|                               | 30-34years | n=26                |
|                               | 35-39years | n=18                |
|                               | ≥40years   | n=11                |

## 3. Results

### 3.1. Respondents (Q1,2)

A total of 183 responses were obtained from the 477 patients (response rate, 38.4%). Large differences in the number of patients and response rate were found among the six clinics (Table 6). By clinic, the number of patients to whom the questionnaire was sent ranged from 18 to 204, and 3-67 patients answered (response rate, 16.7-69.4%). Respondents comprised 78 males and 103 females, with two patients providing no answer to the question of gender. For the gender distribution, the ratio of males to females ranged from 1 to 1.3. Patients ranged in age from 15 to 48years, with the majority of respondents between 20 and 24years old (Table 1).

### 3.2. Before orthodontic treatment (Q3-11)

At the timing of the first orthodontic consultation, patients ranged from 0 to 48years of age. About 25% of respondents were in deciduous dentition (<5years old), 24.0% were in early mixed dentition (6-9years old) and 3.8% did not consult the orthodontist until adulthood. About one-quarter of patients did not answer this question (Table 2a). Parents considered orthodontic treatment first in most cases (74.3%), and information about the orthodontic treatment was mostly given by other team members (surgeons, speech therapists, or dentists; 90%) (Table 2a). Major concerns before treatment were tooth alignment (55.7%), followed by speech difficulties (27.3%), masticatory problems (24.6%), and facial appearance (21.3%) (Table 2a).

In terms of problems before treatment, more than half of patients worried about their facial appearance ("very much" and "slightly", 58.8%) and more than three-quarters of patients (77.6%) worried about tooth alignment. Less than half of patients were worried about masticatory problems (42.3%), while more than half had speech difficulties (51.7%) (Table 2b). The most expected effect of orthodontic treatment was improvement of tooth alignment, reported by more than half of patients (55.7%). Other patients mostly expected good facial appearance (14.9%) and improvements in functions such as chewing (16.7%) and speech (9.8%) (Table 2b).

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