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Original Research

Evaluation of oral health related quality of life in patients undergoing orthognathic surgery

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ABSTRACT

Objective: To evaluate and compare the oral health related quality of life (OHRQoL) before and after surgery in patients undergoing orthognathic surgery.

Materials and methods: A total of 41 patients who scheduled for orthognathic surgery were included. Interviews were conducted to assess the OHRQoL based on the Oral Impact on Daily Performance (OIDP) index preoperatively as well as 3 and 6 months postoperatively. The overall OIDP scores and condition-specific OIDP (CS-OIDP) scores attributed to malocclusion, facial dissatisfaction and neurosensory disturbance were evaluated.

Results: The average overall OIDP scores of preoperatively, 3 and 6 months postoperatively were 18.3, 9.4 and 7.3, respectively. There were significant differences of overall OIDP scores between preoperatively and both 3 and 6 months postoperatively at 0.006 and <0.001. Moreover, there were significant differences of CS-OIDP scores attributed to malocclusion and facial dissatisfaction when compared preoperatively and both 3 and 6 months postoperatively (p -value ≤ 0.05).

Conclusions: Orthognathic surgery improved OHRQoL in holistic view. Moreover, specific conditions including malocclusion and facial dissatisfaction were improved significantly after surgery.

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1. Introduction

Dentofacial deformity (DFD) is acquired abnormality in facial proportion and dental relationship which affects patient appearance, chewing or speaking [1]. Moreover, it affects the mental and social life of patients. All these factors are directly or indirectly affecting the patients' quality of life. Orthodontic treatment combined with surgery is the treatment of choice for DFD patients. The outcome of the surgery promotes a better occlusal function and appearance [2,3]; however, complications after surgery were reported such as numbness of the lips [4], poor satisfaction of facial appearance [5].

Many studies investigated the success of orthognathic surgery which mostly focused on the clinical outcome of the jaw function [6–8]. Some studies also evaluated satisfaction and quality of life

of patients after surgery [9–11]. However, there is a few comparative study of oral health related quality of life (OHRQoL) in DFD patients before and after the surgery, and none of study focus on the relationship of OHRQoL and specific conditions such as occlusion, numbness, or appearance.

Oral Impact on Daily Performance (OIDP) is one of the well-known tools used for investigation of OHRQoL. It was developed from the health concept of Locker to link the quality of life and the effect of oral impact in daily life [12]. In 1980, World Health Organization (WHO) classified the impact as, level 1 (clinical impairment), which mean patient suffers from the disease itself, level 2 (intermediate impacts), which means patient suffers from the impacts such as pain, discomfort, functional limitation and dissatisfaction with appearance which results from the disease, and level 3 (ultimate impacts), which refers to the impact on everyday life, including the physical, psychological and social [13]. Thus, OIDP can be used for evaluate the ultimate impacts and widely used in maxillofacial surgery area such as cleft patient [14] and implant patient [15]. The outstanding properties of OIDP were including translation into Thai version with verification, scoring system which helps valuable calculation and evaluation of condition-specific impact (CS impact) which can evaluate specific problem of patients [16,17]. Currently, there is no study that measured condition-specific Oral Impact on Daily Performance (CS-OIDP) in orthognathic surgery patient. Thus,

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the uses of OIDP and CS-OIDP would help evaluate the ultimate outcome in terms of OHRQoL in facial deformity patients.

Objective of this study was to compare the OHRQoL in DFD patients before and after orthognathic surgery using OIDP and CS-OIDP index.

2. Materials and methods

This study included 41 dentofacial deformity patients, who were scheduled for orthognathic surgery, were older than 18 years and were medically accepted for surgery. The patients were recruited from the Dental Hospital of the Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand, between April 2012 and April 2013. The skeletal classification according to Ackerman–Proffit classification of malocclusion was used to classify all patients [18]. Patients with cleft problem, craniofacial syndromes, communication disabilities, post-traumatic deformity, previous orthognathic surgery or rejected to participate in this research were excluded. The study was approved based on ethical considerations by the Ethics Committee of the Faculty of Dentistry, Chulalongkorn University.

3. Data collection

The well-known OIDP index [17] was used for assessment in this study. Briefly, the assessment of serious oral impacts on eight daily performances, three physical activities (eating, speaking and cleaning teeth), three psychological activities (relaxing, smiling and emotion) and two social activities (studying or working and social contact), was used for patient interview. If patients reported an impact on any of eight performances, the frequency of the impact (scale from 0 to 5) and the severity of its effect on daily life (scale from 0 to 5) were scored. If no impact was reported, then zero score was assigned. Then the performance scores were evaluated by multiplying the corresponding frequency and severity scores. After that, the overall score for OIDP was calculated by the sum of the eight performance scores (ranging from 0 to 200), multiplied by 100 and divided by 200 in order to make a total score as 100 [17,19].

The CS-OIDP in this study was focused on three most concerned topics including malocclusion, facial dissatisfaction and neurosensory disturbance. If perceived cause is that patient complaint was related to the focus topics, then it will be recorded as specific problem. All these impact scores on their daily life were collected as condition-specific score and will be calculated with the same method as overall OIDP scores.

The oral impacts were taken by one interviewer who was trained by OIDP expertise. Data were collected from all patients preoperatively (T_0), 3 months (T_1) and 6 months (T_2) postoperatively. The intra-reliability test was performed, Kappa score reported at 0.78 which showed the good reliability.

Demographic data were summarized using descriptive statistic analysis. Overall OIDP scores and CS-OIDP scores were tested normal distribution by one-sample Kolmogorov–Smirnov test, because the data were not normally distributed, nonparametric statistical tests were used. Wilcoxon signed rank test with Bonferroni correction was performed to compare the pair time-series OIDP and CS-OIDP scores. The p -value less than 0.05, based on 95% confidence intervals, was considered statistically significant. Statistical Package for Social Science (SPSS Statistics for Windows, Version 22.0; SPSS Inc., Chicago, IL, USA) was used for analyses.

4. Results

A total of 41 patients who fulfilled the study criteria were included. Patients' age ranged from 19 to 46 years old with mean

Table 1
Demographic characteristics and clinical data of the patients.

	N	%
Socio-demographic information		
Age: Mean \pm SD = 27.0 \pm 6.9 years old, range = 19–46 years old		
Under 20 years	2	4.9
21–29 years	27	65.8
More than 30 years	12	29.3
Sex		
Male	18	43.9
Female	23	56.1
Clinical-related information		
<i>Skeletal relationship and anterior openbite (AOB)</i>		
Skeletal class II	2	4.9
Skeletal class II with AOB	4	9.8
Skeletal class III	31	73.1
Skeletal class III with AOB	5	12.2
<i>Facial asymmetry</i>		
Yes	4	9.8
No	37	90.2
<i>Type of surgery</i>		
1 jaw surgery	29	70.7
2 jaws surgery	12	29.3

age at 27.0 \pm 6.9 years old. Most of the patients' age range at 20–29 years old (65.8%). Eighteen patients (43.9%) were male and 23 patients (56.1%) were female. The majority of patients' diagnosis is skeletal relationship class III (73.1%), followed by problem of skeletal relationship class III with anterior openbite (12.2%), skeletal relationship class II with anterior openbite (9.8%) and skeletal relationship class II (4.9%). Facial asymmetry was found in 4 patients (9.8%). The surgical procedure was mostly performed in 1 jaw surgery (70.7%) (Table 1).

The mean of performance scores and overall OIDP scores are shown in Table 2. There were significant differences in the overall OIDP scores between preoperative surgery and 3 and 6 months postoperative surgery ($p < 0.0001$ and $p < 0.001$, respectively).

Three months after surgery, each performance score was decreased; however, there were significant differences in the aspect of eating, smiling and social contact ($p = 0.011$, < 0.0001 and 0.014 , respectively). While 6 months after surgery, all performance scores were decreased except emotional aspect. There was significant difference in the aspect of eating, speaking, smiling and social contact ($p = < 0.0001$, < 0.001 , < 0.0001 and 0.014 , respectively).

The mean and SD of CS-OIDP scores are shown in Table 3. There were significant differences between CS-OIDP scores both

Table 2
Comparison of overall OIDP scores and performance scores between preoperative (T_0), 3 months (T_1) and 6 months (T_2) postoperative surgery.

Score	Mean (SD)			p -Value $T_1 - T_0$	p -Value $T_2 - T_0$
	T_0	T_1	T_2		
Overall OIDP scores					
Overall OIDP	18.7 (11.7)	9.3 (8.4)	6.2 (6.7)	<0.0001*	<0.0001*
Performance scores					
Eating	10.2 (8.1)	6.2 (6.7)	2.9 (4.9)	0.011*	<0.0001*
Speaking	6.9 (7.5)	4.7 (6.6)	1.6 (3.7)	0.205	<0.0001*
Cleaning	1.4 (5.3)	0.7 (3.9)	0	0.180	0.109
Relaxing	0.7 (2.9)	0	0	0.109	0.109
Emotion	6.5 (7.3)	5.3 (7.4)	6.7 (7.5)	0.530	0.986
Smiling	7.4 (8.8)	1.0 (3.6)	0.4 (2.5)	<0.0001*	<0.0001*
Studying or working	1.5 (4.9)	0.3 (2.3)	0	0.136	0.063
Social	2.5 (5.7)	0.6 (3.9)	0.6 (3.9)	0.014*	0.014*

(T_0): preoperative surgery; (T_1): 3 months postoperative surgery; (T_2): 6 months postoperative surgery.

* Wilcoxon signed ranked test; $p \leq 0.05$.

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