

Surgery-first orthognathic approach vs traditional orthognathic approach: Oral health-related quality of life assessed with 2 questionnaires

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Introduction: The purposes of the study were to investigate and evaluate the differences detected by the patients between the traditional orthognathic approach and the surgery-first one in terms of level of satisfaction and quality of life. **Methods:** A total of 30 patients who underwent orthognathic surgery for correction of malocclusions were selected and included in this study. Fifteen patients were treated with the conventional orthognathic surgery approach, and 15 patients with the surgery-first approach. Variables were assessed through the Orthognathic Quality of Life Questionnaire and the Oral Health Impact Profile questionnaire and analyzed with 2-way repeated-measures analysis of variance. **Results:** The results showed significant differences in terms of the Orthognathic Quality of Life Questionnaire ($P < 0.001$) and the Oral Health Impact Profile ($P < 0.001$) scores within groups between the first and last administrations of both questionnaires. Differences in the control group between first and second administrations were also significant. Questionnaire scores showed an immediate increase of quality of life after surgery in the surgery-first group and an initial worsening during orthodontic treatment in the traditional approach group followed by postoperative improvement. **Conclusions:** This study showed that the worsening of the facial profile during the traditional orthognathic surgery approach decompensation phase has a negative impact on the perception of patients' quality of life. Surgeons should consider the possibility of a surgery-first approach to prevent this occurrence. (*Am J Orthod Dentofacial Orthop* 2017;152:250-4)

Patient satisfaction among subjects with facial skeletal discrepancies is a fundamental issue for orthognathic surgery. The primary factor in determining the level of patient satisfaction after orthognathic surgery is the perception of the changes and therefore the patient's opinion of the esthetics.¹ For

the majority of these patients, the objective is to obtain a significant improvement in both the esthetics of their faces and oral functionality.² At a psychological level, the surgeon's job is to prepare patients for the results of the operation before the surgery, so that the results can meet their expectations.

In longitudinal investigations by Cunningham et al,^{3,4} orthognathic patients were reported to have some psychological characteristics: high level of anxiety, and low satisfaction of body image and facial image, although this had borderline significance. These negative repercussions on the patient's psychological state are probably related to the long orthodontic treatment and decompensation of the dental elements causing temporary worsening of the facial esthetics, transitory worsening of mastication, and improvement of oral discomfort.²

Another important issue is the discomfort that the patient will initially suffer in the postsurgery period (problems related to oral functionality, pain, neurosensory

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deficit, bleeding, swelling, and scarring).⁵⁻⁷ Furthermore, some patients may experience reactive depression as a consequence of surgical treatment and require social support in the postoperative phase.^{3,8} Other disadvantages perceived by the patient and connected to this procedure are the duration of the therapy and its possible negative effect on the patient's compliance.⁹ Another negative factor reported by patients is the inability to predict the date for the surgery; this often causes protracted anxiety and uncertainty throughout the waiting period.¹⁰ These factors can discourage the patient from undergoing the therapy.

Surgery first is an orthognathic surgical procedure that is in constant evolution and diffusion.¹¹ Its success has been defined by the number of advantages offered and is definitively determined by the satisfaction of the patients themselves. The approach of surgery first differs from the traditional approach used in orthognathic surgery because it consists of only 2 phases: the surgery and the postsurgery orthognathic therapy.

The main advantages of this method, with regard to the level of satisfaction with the treatment, are the possibility of eliminating or reducing the presurgery orthodontic treatment, surgically repositioning the jaws immediately into the desired position, and a short orthodontic therapy afterward. This new approach is also frequently requested by patients because it is possible to see improvements in facial esthetics immediately and the duration of the therapy is significantly shortened.¹²

Patient-assessed health outcome measures were introduced to examine the relationship between oral health and the sense of well-being and the patient's perceived quality of life. The definition of life quality was introduced in 1993 by the World Health Organization as "the perception of people with regard to their situation in life, within the cultural context and values with which they live, in relation to their objectives, expectations, patterns and concerns."¹³ Although the quality of life is a subjective concept, several questionnaires were created to assess it. Among those, the most widely used is the Oral Health Impact Profile (OHIP) that evaluates the person's perception about quality of living in relation to oral conditions. The OHIP includes 49 items, divided into 7 sections: functional limitation, physical pain, psychological discomfort, physical incapacity, psychological incapacity, social incapacity, and difficulty doing usual jobs. Its short version, the OHIP-14, was published in 1997; it includes 14 questions divided into the same 7 sections.¹⁴

The Orthognathic Quality of Life Questionnaire (OQLQ-22) was developed and validated by Cunningham et al,⁴ whose objective was to assess the impact

of dentofacial deformities and the benefits of orthognathic surgical treatment on patients' quality of life.

In this article, we aimed to investigate and evaluate the differences detected by the patients between the traditional orthognathic procedure and the surgery-first approach.

MATERIAL AND METHODS

Patients affected by dentoskeletal malformations having orthognathic surgery at the Department of Surgical Sciences for Head and Neck Diseases at Catholic University of Sacred Heart in Rome, Italy, between July 2014 and July 2015 were asked to participate.

The study sample consisted of 30 consecutive patients (20 women, 10 men; mean age and standard deviation [SD], 30.2 ± 4.3 years; range, 19-45 years) who were selected for bimaxillary surgery for correction of Class II ($n = 15$) or Class III ($n = 15$) occlusal relationships.

The inclusion criteria were affected by maxillomandibular malformation, mild to no dental crowding, and mild Spee curve.

Exclusion criteria were any other facial corrective surgery, any compensatory orthodontic treatment, chronic disease, syndrome involving the craniofacial area, and malformations secondary to clefts.

The study was conducted according to the 1975 Helsinki Declaration, as revised in 2000.

All participants provided written informed consent after receiving explanations of study objectives and procedures.

Patients were randomly assigned to 2 groups: the test group that underwent orthognathic surgery according to the surgery-first approach and the control group that had the conventional orthognathic surgery.

The 2 groups were homogeneous for sex and age.

All patients in the control group were prepared for surgery with a variable period of orthodontic therapy (mean duration and SD, 20.6 ± 1.9 months; range, 18-24 months).

All patients were surgically treated with LeFort I and bilateral sagittal split osteotomies of the jaws.

Patients in the test group had orthodontic brackets placed only 3 days before the surgical intervention. They were treated with the surgery-first approach.

Patients of both groups remained in the hospital for an average of 4 days after surgery (range, 2-7 days).

To evaluate the differences detected by the patients between the traditional orthognathic procedure and the surgery-first approach, the patients were given the following self-administered questionnaires before bracket placement, 1 month preoperatively and 1 month postoperatively for both groups: the OQLQ-22 and the OHIP-14.

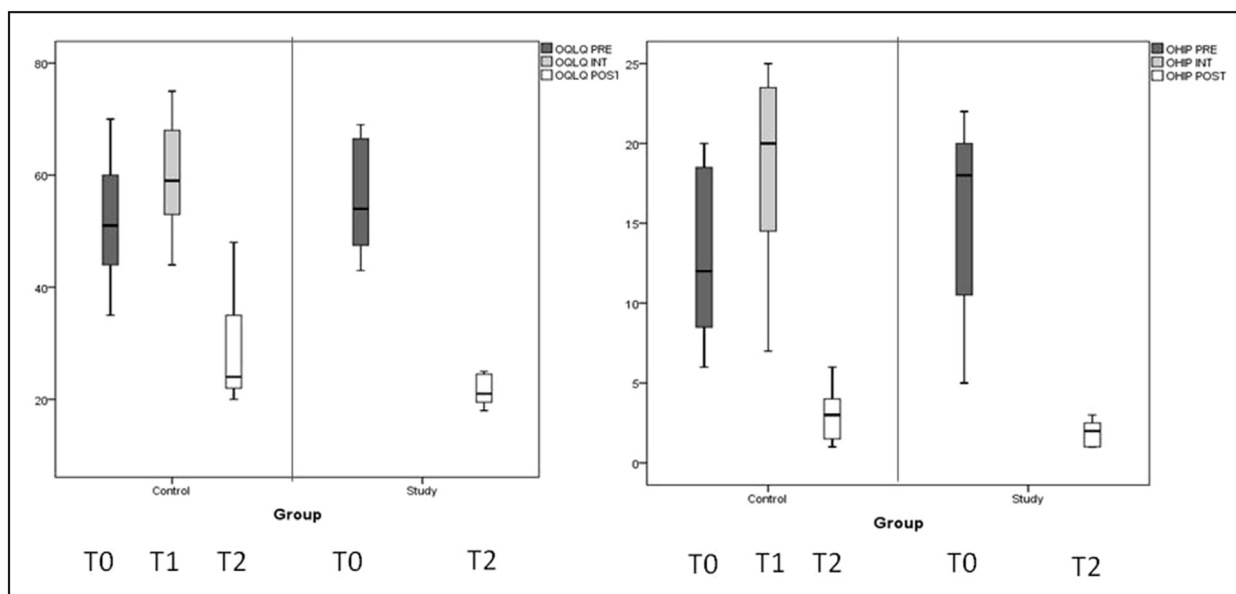


Fig. Left, Distribution of OQLQ scores at various stages of the intervention by group; right, distribution of OHIP scores at various stages of the intervention by group. T0, first administration of questionnaires; T1, second administration for the control group; T2, both groups at the end of the protocol.

The OHIP-14 focuses on the impact of one's oral health condition on quality of life and includes 7 domains (2 items per domain): functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Responses to each item are made on a Likert-type scale and coded as 0, never; 1, hardly ever; 2, occasionally; 3, fairly often; and 4, very often. OHIP-14 scores can range from 0 to 56; 0 indicates no impact, and 56 indicates the worst impact of one's oral health on quality of life. Individual domain scores can be calculated by summing responses to the items in a domain and can range from 0 to 8, with higher scores indicating greater impact.

The OQLQ-22 focuses on one's dentofacial deformity in relation to quality of life and is rated on a 4-point scale with responses ranging from "bothers you a little" (score 1) to "bothers you a lot" (score 4). A total OQLQ score can range from 0 to 88. A lower score indicates better quality of life, and a higher score indicates poorer quality of life. The 22 items contribute to 4 domains: facial esthetics (items 1, 7, 10, 11, and 14, scoring 0 to 20), oral function (items 2-6, scoring 0 to 20), awareness of dentofacial esthetics (items 8, 9, 12, and 13, scoring 0 to 16), and social aspects of dentofacial deformity (items 15-22, scoring 0 to 32).

To more effectively rate patients' satisfaction, the following global measures with 2 questions evaluated

on a 7-point scale were also administered. "Would you have preferred to undergo a long orthodontic treatment reaching a perfect occlusion after the operation?" and "Would you have preferred not to do any presurgical orthodontic treatment, without reaching a perfect occlusion after the operation, and having to do a short orthodontic treatment after the operation?"

These 2 questions, though, are not yet internationally validated.

Statistical analysis

A 2-way repeated-measures analysis of variance was performed to find differences within and between the groups in terms of OHIP and OQLQ scores before and after the intervention. Analyses were performed using SPSS software for Windows (version 22.0; IBM, Armonk, NY). Statistical significance was set at $P = 0.05$.

RESULTS

Overall, data from all 30 patients included in the study were analyzed.

Mean OQLQ scores were 57 (SD 10) and 52 (SD, 10) for the study and control groups, respectively, at the first administration of the questionnaires; 60 (SD 9) at the second administration for the control group; and 22 (SD 3) and 29 (SD 9), respectively, for the study and control groups at the end of the protocol (Fig).

Mean OHIP scores were 16 (SD 6) and 13 (SD 5) for the study and control groups, respectively, at the first administration of the questionnaires; 18 (SD 6) at the second administration for the control group; and 2 (SD 1) and 3 (SD 2), respectively, for the study and control groups at the end of the protocol (Fig).

Significant differences were observed in terms of OQLQ score ($P < 0.001$) and OHIP score ($P < 0.001$) within the groups between the first and last administrations of both questionnaires. Differences in the control group between the first and second administrations were also significant for the OQLQ score ($P = 0.008$) and the OHIP score ($P = 0.050$).

No statistical difference was noted between the 2 groups at the first administration of the questionnaires and the end of the protocol.

DISCUSSION

Personal and professional relationships are constantly influenced by facial esthetics. Patients affected by severe malocclusions might not be satisfied with their facial appearance; they often go to specialists to significantly change their face and solve their functional problems. Orthognathic surgery is the most suitable option for treating this condition.

In the past, studies have demonstrated that most patients affected by dentofacial deformities ask for treatment to improve their facial and dental appearances, even though some studies have reported that the main motivation is functionality rather than esthetics. Patients also seek treatment with the expectation of gaining psychosocial benefits, including improvements in interpersonal relationships and psychological well-being.¹⁴⁻¹⁶

Quality of life is a subjective and hardly assessable concept; for this reason, several questionnaires were created to evaluate it. Among those, the most widely used is the OHIP to assess the patient's perceptions about quality of living in relation to oral conditions. The OHIP includes 49 items divided into 7 sections: functional limitation, physical pain, psychological discomfort, physical incapacity, psychological incapacity, social incapacity, and difficulty doing usual jobs. Its short version, the OHIP-14, was published in 1997; it includes 14 questions divided into the same 7 sections.¹⁴⁻¹⁶

The applicability and validity of the OHIP were tested in many countries and cultures. It can be considered a suitable method that well describes both quality of living and self-esteem, since it includes questions regarding both domains.

Examples of adaptation of the instrument are the OHIP-J, a Japanese version of the original OHIP,

with 5 specific questions added for the population. The NHANES-OHIP is a version consisting of 7 questions; it was applied in a survey of subjects from the United States and Australia. Another version, the OHIP-20, was developed for application in edentulous patients.¹⁷

Similarly, the OQLQ, developed and validated by Cunningham et al,⁴ was also validated worldwide and for different languages and cultures.¹⁷⁻¹⁹ Its objective is to assess the impact of dentofacial deformities and the benefits of orthognathic surgical treatment on patients' quality of life.

The results of this study are in line with those of Choi et al²⁰ and Soh and Narayanan,²¹ who found significant improvements in the quality of life of the patients after orthognathic surgery.

In our control group, both questionnaires were administered, and the results were homogeneous, showing a decrease of the quality of life, in both the OQLQ and the OHIP, during presurgical orthodontic therapy and a fast improvement after orthognathic surgery. These findings are in line with the results of Kavin et al,²² Murphy et al,²³ Alanko et al,²⁴ and Liu et al.²⁵

In both groups, the results showed improvements of the quality of life right after surgery.

These results confirm that facial and masticatory improvements after jaw repositioning lead to a better quality of life in both groups. In the control group, the initial worsening of the values of the questionnaires was caused by the frustration of wearing orthodontic braces for a long time and the progressive worsening of the facial profile and the masticatory function caused by dental decompensation from orthodontic treatment to create a favorable dental position for the surgical repositioning.

The many recent studies on the quality of life of the patients undergoing orthognathic surgery indicate the importance of this topic. Therefore, further comprehensive studies are needed regarding the different aspects of surgery on patients' emotional, psychological, social, and behavioral conditions.

Some limitations of this study must also be reported. Although the results were statistically significant, the size of the sample was too small, and only young patients without evidence of medical conditions were recruited.

Another limitation was the 2 extra questions added to the questionnaires by the authors that have not been validated in the international literature.

The 2 clinical techniques should not just be based on subjective patient evaluations but should also include analyses of outcomes using some objective index such as the Peer Assessment Rating.

CONCLUSIONS

As an overall consideration about quality of life assessment with questionnaires, we can state that the surgery-first orthognathic approach has proven to provide an immediate improvement of the quality of living and to avoid the worsening caused by presurgical treatment and the discomfort of long presurgical orthodontic treatment, although results should be better corroborated by further studies with a larger group of patients.

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