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Questionnaire Evaluation Pre and Post Orthognathic Surgery

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Abstract

Purpose: The aim of the study is to evaluate the changes of quality of life of patients after orthodontic and orthognathic surgery.

Method: The study included 100 patients who underwent BSSO and LeFort 1. All the patients were under a questionnaire which we developed focusing on aspects of the ortho-surgical treatment: pain management, functional capacity, physical aspects, orthodontic and orthognathic timing. We divided the patient into two groups, Group 1 and Group 2, based on their answers: higher discomfort perceived for the surgery and for the orthodontic treatment respectively. We applied the the Mann-Whitney non-parametric test to evaluate the outcome relevance.

Results: Thirty patients (18 females and 12 males) reported more discomfort related to the surgery compared to seventy patients (39 females and 31 males) who considered the orthodontic treatment more discomforting. All the patients considered their expectation satisfied and they would suggest this treatment to other patients who may need it. However, the 13% of Group 1 (higher discomfort perceived for the surgical treatment) would not undergo to this treatment again.

Conclusion: The questionnaires revealed that the patients experienced more discomfort during the orthodontic treatment compared to the surgical treatment. Benefits of ortho-surgical treatment are generally high with a positive influence on patients' quality of life, considering chewing and sleeping improvements as well as aesthetic satisfactions.

Keywords: Questionnaire; Orthognathic; Quality of Life; Maxillo-Facial Surgery; Orthodontic

Introduction

Malocclusions are one of the most common developmental disorders of the face. Due to the complexity of the skull-facial region, many factors may cause a growth defect [1], what's more, they have a multifactorial etiology.

From a study by the National Health and Nutrition Estimates Survey III (NANHES III) we know that about 4% of the population with malocclusion need surgical treatment following orthodontia. Furthermore, patients with dentofacial deformities are afflicted by aesthetic, functional and psychological impairments [2,3].

As a result they often have a lower quality of life experience compared to those with normal malocclusions or Class I [4]. The concept of quality of life was first introduced by the World Health Organization in 1993 and is defined as a sense of well-being bringing under consideration all aspects of his/her life [5,6].

The treatment required to re-establish a correct occlusion and facial

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aesthetic is a combination of orthodontic and surgical treatment. Several studies have demonstrated that most patients undergo orthognathic treatment to correct and improve appearance: aesthetic of the face and teeth; nearly all patients obtain a significant improvement in both aesthetic and oral functionality after surgery [7,8].

Orthognathic surgery consists of mandible and upper jaw osteotomies: bilateral sagittal split osteotomy (BSSO) and Le Fort I, respectively. BSSO can cause the impairment of the inferior alveolar nerve and consequently, neurosensory disturbances depending on the quantity of exposed nerve [9]. However, neurosensory disturbance constitutes a notable risk for a minority of patients and may persist in a mere 10% after two years [10,11].

The aim of this study was to determine which treatment, either surgery or orthodontia, caused more discomfort for patients. Another purpose of this investigation was to quantify the satisfaction level in patients as well as their expectations.

Subjects and Methods

One hundred patients were included in this study. All patients were diagnosed with II and III malocclusion classes that required orthognathic surgery. The surgery was a combination of BSSO and Le Fort I. These surgeries were performed between September 2012 and February 2017. All patients were older than 21 years and were chosen among all patients treated during these five years.

Inclusion criteria were patients with II or III malocclusion class, patients undergoing orthognathic surgery, signed consent, combined orthodontic-surgery treatment, patients older than 21.

Exclusion criteria were previous orthognathic surgery, other orthognathic procedures including genioplasty, as well as simultaneous wisdom teeth extractions, history of facial trauma.

All patients were informed of the study's scope and signed an informed consent. We decided not to use the Orthognathic Quality of Life Questionnaire (OQLQ). Rather, we developed our own questionnaire focusing on aspects of the ortho-surgical treatment: pain management, functional capacity, physical aspects, orthodontic and orthognathic timing [table 1].

The interview functions on a point system, assigning a value from 0 to 10 to each question. We included some questions related to personal impact of the surgical treatment with a yes/no score, as well as questions related to timing.

We also asked the patients to choose whether the personal discomfort perception was caused by the orthodontic or the orthognathic treatment.

Descriptive statistics were performed, including mean and standard deviation for quantitative valuables, and percentage for qualitative valuables. We applied the Mann-Whitney non-parametric test to compare the 2 samples and a significance level of 95% ($p<0,05$) was used.

Results

Thirty patients (18 females and 12 males) reported more discomfort related to the surgery as compared to seventy patients (39 females and 31 males) who considered the orthodontic treatment more discomforting. In order to report the remaining results, we divided the patient into two groups, Group 1 and Group 2, based on their answers: higher discomfort perceived for the surgery and for the orthodontic treatment respectively.

Table 1: Our questionnaire for patient

1. Male or Female?	M/F
2. Did you perceive more discomfort during the orthognathic or the orthodontic treatment?	Orthognathic/Orthodontic
3. Were your expectations satisfied?	Yes/No
4. How much this condition influenced your quality of life?	1 2 3 4 5 6 7 8 9 10
5. How long did the pre-surgical orthodontic treatment take?	3-6months/7-11months/>12months
6. How long did the post-surgical orthodontic treatment take?	3-6months / 7-11months/ >12months
7. Orthodontic retainers discomfort?	1 2 3 4 5 6 7 8 9 10
8. Post-op pain during hospitalization?	1 2 3 4 5 6 7 8 9 10
9. Post-op pain during the first month?	1 2 3 4 5 6 7 8 9 10
10. When you did you experience the maximum post-op pain?	Never/ 24/48hours/ ≥4days
11. Post-op general discomfort?	1 2 3 4 5 6 7 8 9 10
12. Would you redo the treatment?	Yes/No
13. Would you suggest the treatment?	Yes/No
14. How much is the chewing improved?	1 2 3 4 5 6 7 8 9 10
15. How much is the quality of sleeping improved?	1 2 3 4 5 6 7 8 9 10

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Table 2: Percentage results for qualitative valuables.

Were your expectations satisfied?	Group 1: 100% yes
	Group 2: 100% yes
Would you redo the treatment?	Group 1: 86,7% yes; 13,3% no
	Group 2: 100% yes
Would you suggest the treatment	Group 1: 100% yes
	Group 2: 100% yes
How long did the pre-op orthodontic treatment take?	Group 1: 3-6 months: 10%; 7-11 months: 40%; >12 months: 50%
	Group 2: 3-6 months: 4,29%; 7-11 months: 22,85%; >12 months: 72,86%
How long did the post-op orthodontic treatment take?	Group 1: 3-6 months: 20%; 7-11 months: 50%; >12 months: 30%
	Group 2: 3-6 months: 54,28%; 7-11 months: 30%; >12 months: 15,72%
When did you experience the maximum pain?	Group 1: never: 30%; 24/48h: 30%; ≥ 4 days: 40%
	Group 2: never: 24,3%; 24/48h: 35,7%; ≥ 4 days: 40%

Table 3: M=Mean, SD=standard deviation and MED=median results for quantitative valuables

Post-op pain during the first month?	Group 1: M&SD: 3,4±2,58; Med: 3
	Group 2: M&SD: 2,04±1,34; Med: 1
General Discomfort after surgery?	Group 1: M&SD: 6,3±2,76; Med: 7
	Group 2: M&SD: 7,07±1,98; Med: 7,5
How much is the chewing improved?	Group 1: M&SD: 4,2±3,24; Med: 5
	Group 2: M&SD: 8,1±2,7; Med: 9
How much is the quality of sleeping improved?	Group 1: M&SD: 1,9±2,74; Med: 1
	Group 2: M&SD:5,05±3,93: Med: 3,5

All patients in both groups agreed that their expectations had been met following the ortho-surgical treatment.

Results were divided in qualitative [table 2] and quantitative [table 3] valuables.

From the Mann-Whitney non parametric test, applied to all the quantitative valuables, emerged that all the results are

Discussion

Aesthetic influences an individual's self-esteem and consequently all his/her relationships [12-15].

The questionnaires revealed malocclusion impacts the quality of life in a substantial way. Many articles showed that facial aesthetics have a major effect on psychological attitudes. Patients had problems with social situations and activities and some were bullied and teased over their appearance [16,17-19].

Orthognathic treatment is seeking to resolve this issue in order to improve facial and dental aesthetic and have functions reestablished [20]. All patients in this study were satisfied after the treatment. They reported that their expectations were met and saw improvements in facial and dental appearance. This fact is in accordance with the literature: improvements in facial appearance are noted in 82-99% of patients and dental appearance are also noticed in greater than 90% [16,21-25].

After treatment several patients reported a decrease of bullying and an increase in self-confidence [18], and consequently, an improvement in social interaction [16,26-28].

An interesting retrospective fact that we noticed is that some patients changed the way they took pictures of themselves. On Facebook they used to post pictures with part of their face covered with hair or hands or pose in profile. Months after surgery, however, the portraits used were all full frontal and smiling [Figure 1, Figure 2]

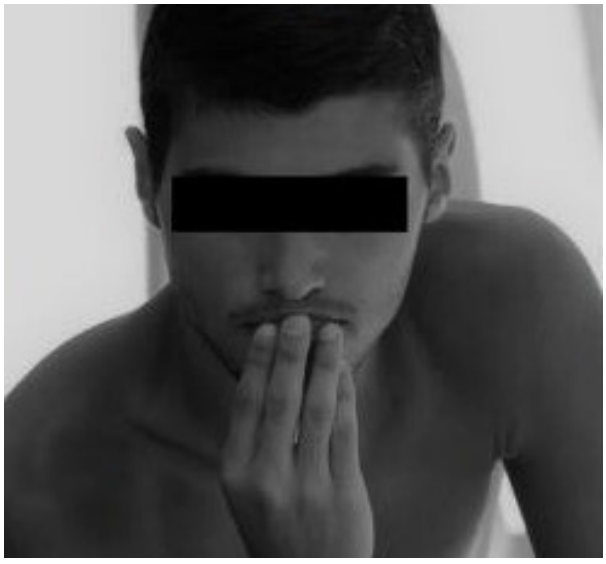

Figure 1: Patient's photo before orthognathic surgery

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Figure 2: Patient's photo after orthognathic surgery

We can surmise that some patients gained self-esteem. This boost in self-confidence agreed with other studies where 45-81% of patients felt that their self-esteem had improved after surgery [23-25,29,30].

However, even if all patients were satisfied with the outcome, there was still 4% who would not be willing to undergo the procedure again. These patients belong to group 1: patients who felt more discomfort from surgery and they were all females. According to literature 63-88% of patients would undergo the procedure again and 70-95% would recommend it to others [21-29-32].

Improvements in chewing for most of the patients was also experienced and the literature showed an increased ability in eating post orthognathic treatment [16,24]. Considering the data previously described, the Group 1 median (5) is higher than the mean (4,2) so we can say that half of the patients reported a chewing amelioration. This result is consistent and more significant in Group 2 (median=9 and mean=8,1).

However, patients did not register any improvement in sleep quality. A few individuals with malocclusion have difficulties in breathing at night yet many articles assessed the effectiveness of orthognathic surgery. Surgery caused an increase in volume in the upper airway which routinely enabled patients to breathe more easily than before treatment [33-39].

Additionally, our questionnaires investigated a personal evaluation of sleep quality. This is difficult for patients to self-analysis which might explain why they did not report any significant improvement.

All the results of the questionnaires turned out to be statistically significant including the post-op pain evaluation during hospitalized recovery time and the first month post-surgery. Maximum pain was experienced by 40% of patient in the group 1 and group 2. Considering the mean and median scores reported by most of the patients on the post-op pain, we can say that surgical procedures were perceived as not excessively painful.

Out of 100 patients, 70 stated that the orthodontic treatment resulted in more discomfort than surgery. Orthodontia can be divided in two phases: pre-surgery and post-surgery treatments. Pre-surgery is considered the worst aspect of the treatment due to the consequences: it induced a worsening of dentofacial aspects resulting in a stronger emphasis of skeletal disharmony [40-42], and this often leads to increased prejudice in others [43]. The orthodontic treatment should have precise time limits; the pre-operative phase should not last longer than two years and the post-operative treatment no less than 9 months [44,45].

Our findings concurred with the literature: the pre-surgical preparation created more discomfort than surgery and patients considered orthodontia a disadvantage of the orthognathic treatment.

In conclusion, the questionnaires revealed the orthodontic treatment were far more disagreeable. Although post-operative pain and orthodontic treatment, patients felt that orthognathic surgery has had a positive effect and they are most satisfied with the outcomes. Yet, there are a few patients that would not undergo the surgery again. To conclude the benefits of ortho-surgical treatment are generally high with a positive influence on patients' quality of life.

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