

Evaluation of life quality of patients submitted to orthognathic surgery

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Objective: To compare changes related to self-esteem and appearance satisfaction between pre and postsurgical phases in patients undergoing orthognathic surgery and to assess the quality of life and psychosocial changes of these patients six months after surgery.

Methods: A longitudinal observational qualitative study was performed. The sample comprised 15 patients with dentofacial deformities who underwent orthognathic surgery. One questionnaire and two forms were answered during pre and postoperative phases.

Results: The results showed that 13.3% of patients demonstrated self-esteem improvement, especially in relation to appearance satisfaction. Improvements were also noted in social, occupational and family relationships. With regard to the assessment of quality of life, according to the World Health Organization questionnaire, the lowest improvement averages corresponded to environmental control.

Conclusion: Orthognathic surgery brings along many emotional changes that should be considered before and after surgery, since the patients' psychological state may be favorable and/or unfavorable during recovery, influencing their quality of life, self-esteem and appearance satisfaction.

Keywords: Quality of life. Oral surgery. Orthodontics.

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INTRODUCTION

Beauty is highly valued in society and it is considered a determining element in interpersonal relationships. Orthognathic surgery allows improvements in masticatory, phonetic and breathing functions as well as in facial esthetics, being an expressive way of raising the quality of life of people with dentofacial deformities. This surgical procedure aims to improve patients' self-esteem, esthetics and function; therefore, any facial changes resulting from the surgery can positively influence patients' personal and social life as well as their psychological state. However, physical and/or psychological complications may occur, such as nerve sensitivity or the patients' difficulty in becoming adapted to their new appearance.¹⁵

In the health field, the interest in quality of life issues is relatively recent. With regard to subjectivity, it comprises the perception of people about their own health and nonmedical aspects of their life, taking into account how people evaluate their personal situation in relation to particular quality of life parameters. Most studies focus on quantitative results concerning the treatment of deformities while only a few focus on the patients' point of view, qualitatively evaluating them.²⁴

According to Fleck et al,⁸ quality of life was defined by the Quality of Life Group of the World Health Organization as "an individual's perception of their situation in life, considering the culture context and value system on which they live and in relation to their goals, expectations, standards and concerns." Despite the growing importance of quality of life assessments in different medical areas, there had not been any assessment tool developed within a cross-cultural perspective and which could be used internationally. Therefore, a 100-question assessment questionnaire was initially created (WHOQOL-100).²³

The need for shorter forms that require little time to be filled out, yet offering satisfactory psychometric readings, was the main reason why the Quality of Life Group of the World Health Organization decided to create an abbreviated version (WHOQOL-bref) of the initial questionnaire (WHOQOL-100). The WHOQOL-bref comprises 26 questions, two questions on general quality of life issues and 24 questions on specific subjects which characterized the original questionnaire. A confirmatory factor analysis was performed to analyze four aspects of which the WHOQOL-bref is comprised of: physical, psychological, social relationships and environmental.¹⁸

The aim of this study was to compare the changes related to self-esteem and appearance satisfaction between pre and postsurgical phases in patients undergoing orthognathic surgery and to evaluate the quality of life of these patients six months after the surgery.

MATERIAL AND METHODS

This study was qualitative, analytical and comprised an observational, longitudinal research. Its target population consisted of 15 randomly selected patients who presented dentofacial deformities and underwent corrective orthognathic surgery at the Oral Surgery and Maxillofacial Trauma division of the Oswaldo Cruz University Hospital, at the University of Pernambuco (HUOC/UPE). Patients with cleft lip and palates as well as other uncontrolled pathologies were not included.

This study had a minimum follow-up period of six months and it was carried out in two different stages: 1) at the presurgical phase, performed on the day of the patients' hospitalization, 2) at the postoperative phase, performed 6 months after the surgery.

A questionnaire and two forms were used to collect the data. An informed consent form and an approval protocol issued by the Ethics Committee of the University of Pernambuco (number 054/07) were attached to the questionnaires to inform the patients and/or their guardian about their participation in the research. A written authorization was requested as well.

Presurgical phase

At this stage, we applied a self-administered questionnaire (answered by the patients) which consisted of eleven multiple choice and/or open-ended questions. Their purpose was to assess the satisfaction of patients with their appearance and social relationships before the surgery (Fig 1).

Postsurgical phase

At this stage, two forms were applied. Form I consisted of fifteen multiple choice and/or open-ended questions assessing the same variables.

Form II consisted of the WHOQOL-Bref questionnaire validated by the World Health Organization (WHO) to assess quality of life (Fig 2).

For data analysis, absolute and percentile distributions, as well as statistic measurements, were obtained. The McNemar's test, the Fisher exact test (provided that

the conditions for using the chi-square test were not confirmed) and the Student t test with equal and unequal variables (inferential statistical techniques) were applied to those measurements. The verification concerning the hypothesis of equality of variances was performed using the Levene's F test. Data were imported to an Excel spreadsheet and statistical calculations were carried out using SPSS 13.0. The method error considered for the statistical tests was of 5.0%.

RESULTS

The age of the subjects ranged from 17 to 35 years, with a mean value of 25 years old, a 5.70 year standard deviation and a variation coefficient of 22.80%.

The prevalent surgical procedures were “two-jaw corrections” (26.7%), followed by “maxillary advancement” (13.3%) and “mandibular setback” (13.3%). “Bite problems” were the most frequent reported reasons for seeking treatment, corresponding to 40%.

No patient had undergone psychological or speech therapy before or after the surgery. Most patients claimed to have a good self-esteem before and after the

surgery. 13.3% of patients who had claimed to have fair self-esteem claimed to have a good self-esteem 6 months after the surgery (Table 1).

Before the surgery, a little more than half (53.3%) of patients claimed to be little satisfied with their own appearance, 40.0% claimed to be satisfied and only one patient claimed to be very satisfied. After the surgery, 33.3% out of 53.3% of patients who had claimed to be “little satisfied” became “satisfied”, and 20% claimed to be “very satisfied”.

Regarding social relationships, 64.3% reported that their professional relationships continued the same after surgery, 21.4% reported slight improvements and 14.3% reported significant improvements. Moreover, 60.0% of patients reported that social relationships continued the same after surgery, 20.0% reported slight improvements and 20.0% reported significant improvements in social relationships after surgery.

When asked about their satisfaction in regards to the surgical outcomes (Table 2), 93.3% of patients stated that the surgical outcomes met their expectations and two-thirds (66.7%) would undergo surgery again.

Research control: Name: _____ Number: _____ Sex: () F () M Age: _____ Race: _____ Address: _____ Phone: (____) _____ Educational background: <input type="checkbox"/> 1º Incomplete <input type="checkbox"/> 2º Incomplete <input type="checkbox"/> 3º Incomplete <input type="checkbox"/> 1º Complete <input type="checkbox"/> 2º Complete <input type="checkbox"/> 3º Complete Occupation: _____ What type of surgery will you go through? <input type="checkbox"/> Maxillary advancement <input type="checkbox"/> Maxillary setback <input type="checkbox"/> Superior repositioning of the maxilla <input type="checkbox"/> Inferior repositioning of the maxilla <input type="checkbox"/> Segmental maxillary surgery <input type="checkbox"/> Mandibular advancement <input type="checkbox"/> Mandibular setback <input type="checkbox"/> Mentoplasty <input type="checkbox"/> Combined maxillary and mandibular surgery <input type="checkbox"/> Maxillary expansion What made you seek treatment? <input type="checkbox"/> I thought I needed. <input type="checkbox"/> My relatives thought I needed <input type="checkbox"/> My friends thought I needed <input type="checkbox"/> My dentist thought I needed.		Why did you seek treatment? <input type="checkbox"/> Bite problems <input type="checkbox"/> Esthetic reasons <input type="checkbox"/> Both <input type="checkbox"/> Other. What: _____ How do you consider your self-esteem today? <input type="checkbox"/> Good <input type="checkbox"/> Bad <input type="checkbox"/> Fair Are you satisfied with your appearance? <input type="checkbox"/> No <input type="checkbox"/> A little <input type="checkbox"/> Satisfied <input type="checkbox"/> Very satisfied Are you undergoing orthodontic treatment? <input type="checkbox"/> Yes <input type="checkbox"/> No Are you undergoing psychological therapy? <input type="checkbox"/> Yes <input type="checkbox"/> No Are you undergoing speech therapy? <input type="checkbox"/> Yes <input type="checkbox"/> No How are your social relationships before the surgery? <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Bad How are your family relationships before the surgery? <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Bad How are your professional relationships before the surgery? <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Bad
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Figure 1 - Self-administered questionnaire applied at presurgical phase.

Most patients (86.7%) would recommend surgery to their family members, however, one third (33.3%) claimed to have postsurgical complaints and when asked about the main reasons concerning postsurgical complaints, the answers were: 24-hour postsurgical recovery (66.7%), difficulty for eating (60.0%), one- week postsurgical recovery (46.7%) and maxillomandibular immobilization with rubber bands (33.3%).

With regard to the statistics on quality of life concerning each of the four areas of the WHOQOL-bref, the results demonstrate that the lowest mean was recorded for environmental area (70.22), ranging from 81.50 to 85.78 in the other three areas. However, except for two patients in the physical and psy-

chological areas and one patient in each of the other areas, all the others had their quality of life classified as high (Tables 3 and 4).

Assessments on the quality of life according to the WHO questionnaire showed that the mean value was higher among patients who went through maxillary surgery than those patients who underwent mandibular surgery, according to physical and environmental areas (Fig 3). The opposite occurred in the psychological and social relationships areas, revealing that the greatest difference was recorded in the physical area (88.50 x 78.00), followed by the social relationships area (88.00 x 81.33). However, the only significant difference was recorded for the physical area ($p < 0.05$).

Research control: Name: _____ Number: _____ Sex: () F () M Age: _____ Race: _____ Address: _____ Phone: (____) _____ Educational background: <input type="checkbox"/> 1º Incomplete <input type="checkbox"/> 2º Incomplete <input type="checkbox"/> 3º Incomplete <input type="checkbox"/> 1º Complete <input type="checkbox"/> 2º Complete <input type="checkbox"/> 3º Complete Occupation: _____ What type of surgery did you go through? <input type="checkbox"/> Maxillary advancement <input type="checkbox"/> Maxillary setback <input type="checkbox"/> Superior repositioning of the maxilla <input type="checkbox"/> Inferior repositioning of the maxilla <input type="checkbox"/> Segmental maxillary surgery <input type="checkbox"/> Mandibular advancement <input type="checkbox"/> Mandibular setback <input type="checkbox"/> Mentoplasty <input type="checkbox"/> Combined maxillary and mandibular surgery <input type="checkbox"/> Maxillary expansion Postoperative period (months): _____ How do you consider your self-esteem after the surgery? <input type="checkbox"/> Good <input type="checkbox"/> Bad <input type="checkbox"/> Fair How do you see yourself today? <input type="checkbox"/> Same as before <input type="checkbox"/> A little better <input type="checkbox"/> People say I look better <input type="checkbox"/> Much better Are you satisfied with your appearance today? <input type="checkbox"/> No <input type="checkbox"/> A little <input type="checkbox"/> Satisfied <input type="checkbox"/> Very satisfied		Did you get the results you expected? <input type="checkbox"/> Yes <input type="checkbox"/> No Do you have complaints regarding the surgery? <input type="checkbox"/> No <input type="checkbox"/> Yes. What? _____ What was the most bothersome aspect of surgery? <input type="checkbox"/> No <input type="checkbox"/> Yes. What? _____ What was the most bothersome aspect of surgery? <input type="checkbox"/> Immediate postoperative phase <input type="checkbox"/> Hospitalization <input type="checkbox"/> 24-hour postoperative phase <input type="checkbox"/> One-week postoperative phase <input type="checkbox"/> Eating issues <input type="checkbox"/> Immobilization <input type="checkbox"/> Paresthesia <input type="checkbox"/> Other. What? _____ Would you undergo surgery again? <input type="checkbox"/> Yes <input type="checkbox"/> No Would you recommend the surgery to your family members? <input type="checkbox"/> Yes <input type="checkbox"/> No Are you undergoing psychological therapy? <input type="checkbox"/> Yes <input type="checkbox"/> No Are you undergoing speech therapy? <input type="checkbox"/> Yes <input type="checkbox"/> No What changed in your life after the surgery? Social relationships <input type="checkbox"/> Same as before <input type="checkbox"/> A little better <input type="checkbox"/> Much better Family relationships <input type="checkbox"/> Same as before <input type="checkbox"/> A little better <input type="checkbox"/> Much better Professional relationships <input type="checkbox"/> Same as before <input type="checkbox"/> A little better <input type="checkbox"/> Much better
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Figure 2 - Self-administered questionnaire applied at postoperative phase.

Table 1 - Self-esteem evaluation before and after the surgery.

Self-esteem (before)	Self-esteem (after)						P Value
	Good		Fair		TOTAL		
	n	%	n	%	n	%	
Good	12	80.0	-	-	12	80.0	p* = 0.500
Fair	2	13.3	1	6.7	3	20.0	
TOTAL	14	93.3	1	6.7	15	100.0	

* McNemar test was applied.

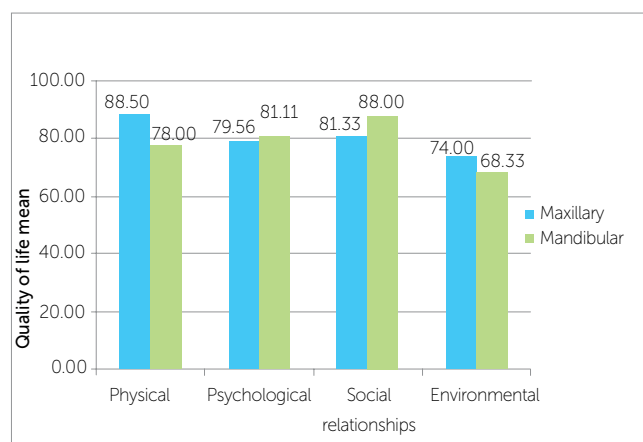
Table 3 - Quality of life score assessment for each area according to the postsurgical evaluation.

Statistics	Area			
	Physical	Psycho-logical	Social rela-tionships	Environ-mental
Mean	81.50	80.59	85.78	70.22
Standard deviation	8.12	6.20	12.31	7.91
Variation coefficient	9.96	7.69	14.35	11.26
Minimum	67.50	66.67	53.33	56.67
Maximum	95.00	88.89	100.0	83.33

Table 4 - Quality of life score assessment for each area according to the postsurgical evaluation.

Statistics	Area							
	Physical		Psychologi-cal		Social rela-tionships		Environmen-tal	
	n	%	n	%	n	%	n	%
Low*	2	13.3	2	13.3	1	6.7	1	6.7
High	13	86.7	13	86.7	14	93.3	14	93.3
TOTAL	15	100.0	15	100.0	15	100.0	15	100.0

*(1) The highest limits for each high area were: 71.5% -100.0% physical, 70.9% -95.8% psychological, 71.1% -100.0% social relationships and 57.2% -93.7% environmental.

**Figure 3** - Quality of life means for each area according to the type of surgery carried out.**Table 2** - Distribution of surveyed patients according to postsurgical variables.

Variables	n	%
How do you see yourself today?		
Same as before	1	6.7
A little better	2	13.3
People say I look better	1	6.7
Much better	11	73.3
Did you get the results you expected?		
Yes	14	93.3
No	1	6.7
Do you have complaints regarding the surgery?		
Yes	5	33.3
No	10	66.7
TOTAL	15	100.0
What was the most bothersome aspect of surgery?		
Immediate presurgical phase	1	6.7
24-hour postoperative phase	10	66.7
Eating issues	9	60.0
Paresthesia	3	20.0
Hospitalization	1	6.7
One-week postoperative phase	7	46.7
Maxillomandibular immobilization with rubber bands	5	33.3
Other	2	13.3
Basis*	15	
Would you undergo surgery again?		
Yes	10	66.7
No	5	33.3
Would you recommend the surgery to your family members?		
Yes	13	86.7
No	2	13.3
TOTAL	15	100.0

*(1) If a single subject mentioned more than one bothersome factor, a basis of the percentages calculations is recorded instead of the total value.

DISCUSSION

Psychological aspects of patients going through orthognathic surgery, has just recently become target of investigation and the WHO questionnaires^{1,8,11,23} has shown to be an efficient tool to evaluate the quality of life of these individuals.

In this study, we used two forms for pre and post-surgical assessment and the WHOQOL-Bref questionnaire for postsurgical assessment, corroborating the methodology used by Modig et al.¹⁵ This questionnaire, recommended by the WHO for quality of life assessments, was the method chosen for this study because there has not been a validated questionnaire

for assessing quality of life in orthognathic surgery issued in Portuguese as recommended by Lee et al.¹¹

The time on which the questionnaires are applied, at pre and postsurgical phases, have been addressed in the literature. Most authors recommend that the questionnaires should be applied on the day of the presurgical orthodontic preparation and six months after the surgery.^{4,5,6,11} The suggestion of a six-month postsurgical phase is due to the fact that, within this period, the edema decreases, allowing a better visualization of esthetic facial and oral function changes, and the patient returns to social interaction.^{4,5,11} However, some questionnaires were applied six weeks or a year after the surgery,^{4,21} once improvements concerning the edema, neurosensory changes as well as bite and speech problems have been identified.^{15,21,26} Some authors recommend that the questionnaires should be applied when removing orthodontic braces or only post-surgically, with no need of applying the presurgical questionnaire.¹⁴ Despite the fact that in the studies of Sadek and Salem²¹ the questionnaires were applied a few days before the surgery, this study applied them a day prior to the surgery. This method had not been used in previous articles, therefore, it may have been the source of biased answers, since that day is when the patients are under extreme presurgical tension. On the other hand, the method of applying the questionnaire six months after the orthognathic surgery was also the method of analysis of several previous studies.^{4,5,6,11}

The reasons patients seek orthosurgical treatment are, oftentimes, exclusively related to esthetics or function, and in most cases such reasons are combined.^{3,5,7,11,14,16,19,26,28,29} Considering that the surgical procedure may result in irreversible changes on the patients' face and personality, both specialist and family should not influence the patients' decision. Thus, the final decision to undergo surgery should come from the patients.^{10,17} Taking these factors into account, the results obtained in this study seemed favorable in regards to the short-term risks and complications that patients go through in order to obtain long-term benefits. Esthetic reasons alone accounted for 20% of the cases, corroborating some publications^{11,15,16} while disagreeing with others which observed that esthetic motivation prevailed over function.^{21,26,29}

Patients seeking professional resources in order to improve their appearance are also seeking to recover their personal and social image. In addition, their expectations are directly related to their degree of satisfaction.^{6,27} Studies have reported that individuals going through orthognathic surgery, who are more concerned with esthetics aspects than others, may have psychological problems. However, the frequency of people with psychological disorders is higher when it comes to plastic surgery.^{10,15}

The study carried out by Kiyak et al.¹⁰ concluded that despite the problems related to the surgery, satisfaction was quite high at the postoperative phase: 84.2% of the subjects said they would go through surgery again and 92.3% said they would recommend it to another person. In this study, we have observed that from the fifteen subjects, 66.7% said they would go through surgery again if necessary and 86.7% said that despite some postsurgical discomfort they would recommend surgical correction to family members, corroborating previous publications.^{11,14,26}

During the presurgical phase of this study, three (13.3%) patients claimed to have a fair self-esteem, however, they reported that their self-esteem improved after the surgery, classifying their self-esteem as good at the postoperative phase. These factors were also observed in earlier publications.^{4,15,16,21,26,29}

The patients' presurgical motivation, their personality, psychological state and other postoperative circumstances such as pain, edema, presence of jaw immobilization, temporary or permanent anesthesia and difficulty eating, are considered as reference to assess the degree of the patients' satisfaction. A detailed and careful presurgical planning and a proper surgical execution are crucial factors for a successful treatment. It is necessary to know each patient individually and the reasons why they are seeking treatment because, oftentimes, facial anomalies or discrepancies can only be addressed through orthognathic surgery.^{2,19}

Among the patients evaluated in this study, 33.3% reported surgical complaints. Sixty percent of patients who had difficulty adjusting a liquid/soft diet, and three patients reported weight loss ranging from 5 to 10 kg a month after the surgery. All patients in this study wore orthodontic rubber bands during the postsurgical phase, removing them only for eating and brushing. It is common for patients to lose weight after

orthognathic surgery due to the decrease in the masticatory function, even when there is no jaw immobilization with rubber bands. Thus, it can be suggested that this difficulty adapting to new eating habits observed in this study may be attributed to the surgery or to the severity of dentofacial deformity, corroborating the findings of Araújo² and Ribas et al.¹⁹

The sample of this study is heterogeneous since the patients selected had not only transverse jaw deformities, but also Classes II and III skeletal deformities. On the other hand, this method is used by several studies that qualitatively evaluate different individuals with deformities aiming at increasing the sample size.^{4,10-15,17,21,26} However, the homogeneity of dentofacial deformities is recommended by some authors,^{16,27,29} since it reduces survey discrepancies, i.e., patients who have large asymmetric facial deformities will show noticeable esthetic facial changes, or individuals with transverse jaw deficiencies who only undergo surgically assisted rapid expansion of maxilla will show minimal changes.

It is recognized that facial changes significantly change the patients' facial appearance and can change the life of an individual in various ways. This has been noticed through the growing number of patients seeking surgical treatment for correcting dentofacial deformities in the last few years.²⁵ Based on oncological and chronic diseases, strong concerns have been raised on the increase in life expectancy.¹⁸ Thus, the development of means to measure the quality of life of these patients has been a challenge for researchers, since they must be able to verify whether these interventions meet the desired goals.²² The results obtained in this study showed improvements in the quality of life of patients after orthognathic surgery as well as improvements related to psychosocial factors. Many patients reported that a few months after the surgery they could observe mainly favorable esthetic results which contributed to improvements in self-esteem and favored social and professional relationships. Moreover, the care and attention received from the patients' family members during the recovery process improved their proximity and contributed to unify the family bonds even more.

According to Ribeiro,²⁰ speech therapy acts in regulating the TMJ muscles and the stomatognathic functions and in reducing the rate of dentofacial deformity relapse after surgery. Although the Oswaldo Cruz University Hospital offers speech and psycho-

logical therapy services, no patient has been treated by those services at presurgical and postsurgical phases. Despite the fact that the importance of a multidisciplinary approach has been highlighted in the literature, especially with regard to patients undergoing orthognathic surgery, this integration does not often occur, corroborating this study. Therefore, the need for a multidisciplinary team should be emphasized due to its immeasurable value in the rehabilitation process, and, as a consequence, the well-being of the patient.

Patients seeking professional resources to address a health deficiency are not only pursuing cure, but also acceptance, understanding, support and affection towards emotionally triggered conditions.^{12,25} Moreover, patients undergoing surgical procedures have significant psychological reactions such as fear, anxiety and expectations that could hinder their recovery and the way they cope with the surgical situation.

Some characteristics of the patients' mental health should be assessed prior to surgery, including depression, anxiety, panic, aggression, drug and alcohol use, problems in school as well as family and social relationships. The overview of these factors may give an insight into the psychological and emotional capacity of the patients undergoing orthognathic surgery.³

Additionally, it is important to know the patients' expectations since the less anxiety a patient presents, the better the chance of success and postsurgical satisfaction. Factors such as pessimism, anxiety and low social support lead to higher risks for problems.^{10,13} Before elective surgeries, a sincere communication between the surgeon and the patient is of paramount importance as it enables the establishment of trust, allowing the patient to participate in discussions regarding the risks and benefits of the surgery; both postsurgical recovery and lifestyle.^{2,15}

We recognize that the low number of subjects and the heterogeneity concerning the types of dentofacial deformities as well as the surgeries that have been carried out are some of the limitations of this study and may have influenced the results.

Unlike orthodontic treatment, which produces gradual changes in dentofacial structure when performed alone, orthognathic surgery causes sudden changes. These physical and psychological changes can be so drastic that they may lead the patients to either sudden satisfaction or regret.

CONCLUSION

When it comes to surgical-orthodontic treatment, esthetic results are considered important motivators influencing the surgical decision making. The main objective of dialogue between specialist and patient is to define what dissatisfies the latter, allowing the surgeon to establish a bond of trust that allows the patient to participate

in discussions concerning the surgical risks and benefits.

The need for orthognathic surgery brings along many emotional changes that should be considered before and after the surgery, since the patients' psychological state may be favorable and/or unfavorable during recovery, influencing their quality of life, self-esteem and appearance satisfaction.

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