Original Article

Psychological Evaluation in Orthognathic Surgery - A Prospective Study

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Abstract

Background: Orthognathic surgery refers to a group of corrective bone operations that involve movement of the jawbones completely or in parts. Orthognathic surgery is indicated when there are severe dentofacial deformities that cannot be managed by orthodontic treatment alone, especially in adulthood, when the natural growth forces have ceased. This study aimed to assess the motivation for surgery for a group of patients undergoing orthognathic surgery in SRM Dental College, Ramapuram, Chennai, to assess the degree of their satisfaction with the outcome of surgery and its effect on the quality of their lives. **Materials and Methods:** This study was done at SRM Dental College, Ramapuram, Chennai in the Department of Oral and Maxillofacial Surgery. A total of 33 patients (24 females and nine males) indicated for orthognathic surgery in the Department of Oral and Maxillofacial Surgery, SRM Dental Hospital, Chennai were included in the study. **Results:** The post-operative complications were short-term complications which gradually declined in intensity and eventually disappeared. The post-operative complications reported were loss of weight and edema. **Conclusion:** Orthognathic surgery is an accepted treatment for men and women of younger adult ages, most often pre-scribed to improve the patient's appearance and the quality of life. It results in tangible benefit that impact the patient's quality of life, in particular of those who are psychologically disturbed.

Keywords: Orthognathic surgery, Psychological impact, Quality of life

Introduction

Orthognathic surgery refers to a group of corrective bone operations that involve movement of the jawbones completely or in parts. Orthognathic surgery is indicated when there are severe dentofacial deformities that cannot be managed by orthodontic treatment alone, especially in adulthood, when the natural growth forces have ceased.[1]

The history of orthognathic surgery dates back to the 19th century when Le Fort described the classic lines of maxillary fracture. Wassmund, in 1927, was the first surgeon to use an osteotomy line on Le Fort I level for the correction of malocclusion. Le Fort I osteotomy was popularized by Obwegeser in the mid-20th century as a standard procedure in maxillofacial surgery to correct dentofacial deformities. The modern history of orthognathic surgery started in the 1970s, as it gradually became a routine choice, with benefits such as improvement of mastication and reduction of facial pain and more stable results even in severe discrepancies. Dentofacial deformities are described as deformities that affect primarily the jaws and dentition. The prevalence of dentofacial deformities has been estimated as 20% of the population worldwide. Desire for esthetic improvement has been expressed as the major reason for seeking orthognathic surgery in several studies.[1-5]

The motivations of orthognathic surgery candidates to seek treatment have been studied by Edgerton and Knorr, who described two types of motivations, external and internal. External motivations include the need to please others, "paranoid" ideas, and beliefs that one's career or social ambitions are being thwarted by physical appearance. These motivations require a change in the patient's environment rather than surgery to solve the problem. Internal motivation is usually a more valid form of motivation and includes long-

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standing inner feelings about deficiencies in one's appearance. These individuals are better candidates for surgery.[1]

This study aimed to assess the motivation for surgery for a group of patients undergoing orthognathic surgery in SRM Dental College, Ramapuram, Chennai, to assess the degree of their satisfaction with the outcome of surgery and its effect on the quality of their lives.

Materials and Methods

This study was done at SRM Dental College, Ramapuram, Chennai in the Department of Oral and Maxillofacial Surgery. At first, approval was obtained from the Institutional Ethical committee to carry out the research. A total of 33 patients (24 females and nine males) indicated for orthognathic surgery in the Department of Oral and Maxillofacial Surgery, SRM Dental Hospital, Chennai were included in the study.

The inclusion criteria for this study were patients with dentofacial deformities seeking orthognathic surgery.

The exclusion criteria for this study were: Patients with any systemic or metabolic diseases, cardiac diseases, mental disorders, psychological disorders, patients with syndromes and drug allergies, pregnant or nursing mothers, and patients unable to comply with the study protocol.

The type of surgery and its expected outcome were explained to each patient and consent was obtained before he/she was scheduled for an operation.

The patients were asked to answer the first part of the questionnaire preoperatively to identify their problems, their motives for seeking surgery, and their expectations from it.

After a period of 6 months–1 year postoperatively, the patients were requested to answer the second part of the questionnaire to assess the postsurgical outcome and the degree of the patient's satisfaction with the result as well as its effect on his/her quality of life.

The questionnaire consisted of 16-item questions, covering information on demographic characteristics of orthognathic patients, patient concern, perception and motivation, expectation, psychological profile, the level of satisfaction with the surgical outcome, and the effect of orthognathic surgery on patient's quality of life. The questionnaire used in the study was designed by Ahmed *et al*. which was designed and modified based on the previous studies done by Chang *et al*., Flanary *et al*., Cunningham *et al*., Bell *et al*., and Ayoub *et al*.

The questionnaire was designed to assess the patient in the pre-operative and post-operative periods in two sections. The items of both instruments were designed to investigate the patient's psychological levels. It was structured to record their current feelings before and after the surgery.

The questionnaire was given approximately 1 year after surgery to eliminate postoperative effect on the patient well-being, and to ensure continuity in the responses. The items in the first subscale assessed emotional distress and psychological status before surgery, pre-operative expectations and the patient's perception of orthognathic surgery. The main items in the pre-operative section included anxiety/distress, preoperative explanation of surgical procedures, psychological relaxation of participant, post-operative complications, trust in the surgical team, and family support.

The second subscale concerned the post-operative period with questions about adjusting to their new profile, anxiety/distress, patient's opinion about their body image, depression after surgery, satisfaction with surgical outcome, improvement in their concept of beauty, increase in self–confidence, and improvement in social relations. The second subscale of the inventory was given to the patients 1 year after surgery to ensure continuity in the responses and to prevent any bias. Major postsurgical sequences (edema, paresthesia, mastication, and speech problems) have generally disappeared by then. To prevent overstatements, patients were asked to be realistic when completing the questionnaire.

All participants were interviewed after a full explanation of the study and its purposes. Thereafter, each patient was requested to record their responses for the different sections of the questionnaire including the presurgical, surgical and the surgical outcome.

Analysis of data was carried out by examining the responses to each question for the study group.

Results

Of the 33 patients interviewed in this study, 73% of the patients were females and 27% of the patients were males and the age range was between 18 and 35 years old. The presurgical data [Table 1] indicated that 94% of the patients sought orthognathic surgery for esthetic reason. Functional problems such as mastication were also reported as the reason for seeking surgery by few patients. About 70% of the patients were conscious about their dentofacial problems for a period of not <5 years and 15% of the patients were aware of their problem for more than 1 year and 15% of the patients were aware of their problem for <1 year.

The psychological impact of the deformity was reported by 82% of the patients resulting in social anxiety and excessive shyness. About 18% of the patients denied any psychological reasons for surgery. Almost half of the patients (55%) reported no effect on their daily life by their disharmony where as many (42%) suffered despair owing to their disharmony all the time [Table 2]. Seeking surgical treatment because of inner feeling problem (self-motivation) was noted in 30% of patients but the majority reported their motivation as an advice from professional members and family. Most patients (91%) had reported unlimited family support to undergo orthognathic surgery. The pre-operative expectation was improvement in appearance for 94% of the patients and it was function for 3% of the patients and it was unpredictable changes in 3% of the patients [Table 3].

Tables 1a-c: Chi-square test results

a: Psychological impacts of deformity *Psychological implications cross tabulation

	Value	df	Asymp.Sig. (2-sided)
Pearson Chi-square	13.397	4	0.009
Likelihood ratio	12.743	4	0.013
Linear-by-linear Association	8.013	1	0.005
N of valid cases	33		

b: Motivational pattern *Self-satisfaction cross tabulation

	Value	df	Asymp.Sig. (two-sided)
Pearson Chi-square	22.393	4	0.000
Likelihood ratio	27.462	4	0.000
Linear-by-linear Association	18.986	1	0.000
No of valid cases	33		

c: Pre-operative expectation * Quality of life improvement cross tabulation

	Value	df	Asymp.Sig. (2-sided)
Pearson Chi-square	33.000	2	0.000
Likelihood ratio	8.962	2	0.011
Linear-by-linear Association	25.442	1	0.000
N of valid cases	33		

Table 2: post-surgical data

Question	Item	No.	Percentage
Self-satisfaction	1. Excellent	14	42
	2. Good		55
	3. Acceptable	18	3
	4. Substandard	1	
Psychological implications	1. Depressed	4	12
	2. Anxious	27	82
	3. Disordered mood		
	4. Pleased	2	6
	5. Self-confident		
	6. No changes		
Patient's opinion	1. As expected	9	27
	2. Better	24	73
	3. Different		
Face evaluation	1. Good	33	100
	2. Acceptable		
Body evaluation	1. Good	33	100
	2. Acceptable		
Quality of life improvement	1. Yes	32	97
	2. No	1	3

Evaluation of surgical results was focused on the patients overall satisfaction or dissatisfaction by examining different aspects of the perceived outcomes. The vast majority of patients (97%) reported satisfactory results that resolved their pre-surgical problems and one patient reported acceptable results. The overall changes gained by surgery were judged to be far better than what had been expected in 73% patients

Table 3: Presurgical data

Question	Item	No.	Percent
Reason for seeking surgery	1. Appearance	31	94
	2. Function	2	6
	3. Pain		
	4. Speech difficulty		
Awareness of the problem	1. About I year	5	15
	2. More than I year	5	15
	3. More than 5 ears	23	70
Psychological impacts of deformity	1. Interpersonal sensitivity		
	2. Social anxiety	17	52
	3. Excessive shyness	10	30
	4. Obsessive compulsive	6	18
	5. Social demand		
	6. None		
Effect on daily life	1. Always	14	42
	2. Sometime	1	3
	3. Never	18	55
Motivational pattern	1. Self-demand	10	30
	2. Family advice	1	3
	3. Doctors' advice	22	67
	4. Social demand		
Family support	1. Yes	30	91
	2. No	3	9
Pre-operative expectation	1. Improvement in facial look	31	94
	2. Improvement in function	1	3
	3. Changes in upper jaw	1	3
	4. Changes in lower jaw		
	5. Un predicted change		

and in 27% of the patients; the changes were just as had been expected. The post-surgical psychological status for all participants after surgery was reported as either as pleased or self-confident. About 12% of the patients were very delighted with the results and 82% reported increase in self-confidence improvement in the quality of life was reported by 97% of the patients and all the patients rated the changes of their facebody image as good [Table 2].

The statistical results prove that there is a strong positive correlation between the psychological impact of the dentofacial deformities preoperatively and the psychological changes seen in the patient after the surgery ($P = 0.009$) [Table 1a]. The statistical results also prove that there is a strong positive correlation between the motivational pattern of the patient and patient satisfaction after the surgery ($P = 0.000$) [Table 1b]. The statistical results also prove that there is a strong positive correlation between the pre-operative expectation of the patient and the improvement of quality of life after the surgery ($P = 0.000$) [Table 1c].

The post-operative complications were short-term complications which gradually declined in intensity and eventually disappeared. The post-operative complications reported were loss of weight and edema. One patient reported pain in the temporomandibular joint as a post-operative complication.

Discussion

Skeletal disfigurement has a negative impact on a patient's social life and can cause psychological and interpersonal problems. Furthermore, dentofacial deformities can negatively and severely affect patients psychologically and impact their appearance and functional capacities. Therefore, surgical treatment of these dentofacial deformities is important to improve their psychological health as well as their self-confidence in everyday life.[6] In this study, the patient's demand for orthognathic surgery seemed to be largely driven by desire to improve their appearance. The previous studies have revealed that patient's motives for seeking orthognathic surgery were primarily related to appearance than functional issues.[2,7-11] The motives for improving aesthetics in this study varied among individuals, which supports the findings of the study carried out by Ryan *et al*.[7]

In this study, for some patients, the motive was improvement of physical attractiveness regardless of the severity of deformity. Some others felt esthetically impaired to the degree of having a social handicap. Some patients felt embarrassed on interaction with people before orthognathic surgery due to their dentofacial deformity. In these patients, the surgery had a positive influence on their relationships and their interaction with people.

In this study, 97% of the patients reported an improvement in facial appearance and satisfaction with the post-operative aesthetic changes. Improvement of facial esthetics after surgery was associated with improvement of social acceptance.[7]

According to the results of the questionnaire, a majority of patients, that is, 97% of the patients had positive changes in many aspects of quality of life after surgery. They showed a rise in morale, self-contentment and self-esteem and change in lifestyle as a result of surgery. These findings support the impression that patients seeking orthognathic surgery are psychologically stable.

In this study, the patients seemed to have realistic expectations from the surgery. This was evident in the high degree of correlation between the aim of the surgery and the outcome that led to the satisfaction with the treatment. In this study, many female patients reported an increased self-confidence due to improvement in facial appearance after the surgery. They reported that the increase in self-confidence after surgery helped them in their interaction with people and it led to an increase in their social confidence. Some male patients also reported an elevation in self-confidence after the surgery which led to a change in their lifestyle and helped them to interact with people with more confidence. Some patients also reported getting a better job due to the improvement in facial appearance after the surgery. Patients with light and moderate facial deformity have no significant psychological problems but patients with severe facial deformity show a significantly higher prevalence of emotional instability, introversion anxiety, and unsociability and such psychological profiles make orthognathic patients with severe facial deformity prone to psychological distress, depression, and adverse psychological reactions.[12]

Incorporating patient perceptions is important in treatment planning, treatment decision-making, and evaluation of treatment outcomes.[13] During the preparation of patients for orthognathic surgery, more emphasis is required at the patient preparation stage to understand the emotional and psychosocial status and expectations of patients, in addition to the focus on their esthetic and functional needs.[1] In addition to verbal information, the patient should be given written information concerning surgical treatment procedures and the surgeon should explain the course of surgical treatment and prepare the patient psychologically for the surgery.[9,11,14,15] It is well known that satisfaction and the perception of surgical outcome are dependent upon preoperative expectations of the patient and the extent to which the procedure is explained by the surgical team.[14] The clinical relevance of identifying patient expectations is not just to ration treatment or identify those who will make good or bad candidates for treatment, but to be able to offer them additional support to enhance satisfaction with the outcome. The importance of fully considering patients' expectations is the key to improving satisfaction.[1,16,17]

Stratifying psychological risk before surgery is important and could lead to more predictable identification of patients with an elevated risk for psychological adverse outcomes.[18] Patient's family members should also be informed about the facial changes resulting from surgery. For patients who would like to speak with somebody who has undergone the operation, such an opportunity should be arranged. The amount of presurgical information has to be planned individually, since all the patients do not want to hear a detailed explanation of the operation.[9] The factors associated with unexpected postsurgical events which lead to dissatisfaction after surgery are inadequate explanation of surgery, emotional unpreparedness, unrealistic expectations, poor support system, and inadequate stress coping mechanisms.[11,19] The post-operative adaptation of patients to changes in facial form and oral function takes much longer than expected. This period appears to have a dynamic relationship with interpersonal factors, such as individual's relationship with family, friends, and performance at work or college.[9]

Explanation of the treatment steps prepares patients for surgery, strengthens their faith in the surgical team and increases their satisfaction with the surgical outcome. The pre-operative explanation of surgical steps in details is of paramount importance, because it reduces anxiety and distress. Patients receive inadequate explanation of the surgery prone to be emotionally unprepared and anxious. Patients receiving orthognathic surgery need more specific information about post-operative symptoms following discharge.[20] If there are complications or problems in the sequence of post-operative healing (facial edema, pain, and lip paresthesia), the pre-operative explanation prepares the patients to overcome such unanticipated events without are any distress. Improvement

in self-image reflects improvement in body image, self–confidence, and interpersonal relationships. The psychosocial benefits gained by patients who undergo orthognathic surgery are better social functioning, social adjustment, emotional stability, self-esteem, and facial attractiveness image, positive life changes, and reduced anxiety.[4,11,21-25]

In this study, patients were rated better after surgery by external persons in respect of all dimensions. Their appearance was perceived as being more esthetic and similar to that of eugnathic persons. Due to this positive feedback, patients felt confident about their appearance after the surgery. The surgery had a positive impact on the quality of life of both the female and male patients, improving physical and social aspects. The quality of life of female patients was also improved with regard to emotional aspects.

Conclusion

Orthognathic surgery is an accepted treatment for men and women of younger adult ages, most often pre-scribed to improve the patient's appearance and the quality of life. It results in tangible benefit that impact the patient's quality of life, in particular of those who are psychologically disturbed. Orthognathic treatment has significant potential to improve patients' psychosocial well-being.

The vast majority of patients felt very satisfied with the results of their surgery. Understanding the patient perception and the impact of psychological aspects were paramount in patient management that should move to the forefront of orthognathic surgery goals setting.

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