



Original Article

Evaluating the quality of life among patients undergoing orthognathic surgery using a customized questionnaire: A prospective study

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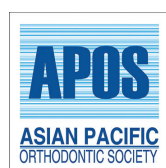
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ABSTRACT

Objectives: A questionnaire, specific to the clinical condition treated is important. The aim of this study was to evaluate the Quality of life (QOL) amongst patients undergoing orthognathic surgery using a customized questionnaire encompassing, patients' perception of facial form and also patient perception of overall quality of care provided during the entire treatment.

Material and Methods: This prospective, qualitative, observational study was carried out on 21 patients, who underwent Ortho-surgical management between Jan 2019 and Mar 2020. The Orthognathic QOL questionnaire was customized, Phase I, immediately prior; and Phase II, 6 months after surgery. Appropriate analysis was done to compare Phase I and Phase II, with the level of significance set to $P < 0.05$.

Results: "Aesthetics" was the most frequent reported reason for seeking treatment. The mean pre-/post-treatment difference for oral function was statistically significant. Majority (87%) of patients reported surgical outcomes met their expectations. Results, post-surgery; good hospital care (33.3%), supportive doctors (28.57%) and regular follow up (9.52%).

Conclusion: "Patients' perspective" of treatment, is often neglected, the immense importance of which has been duly reflected in our study. We recommend the use of our questionnaire in a similar, broad based multicentric study with a larger patient base, will aid in improving overall outcome of ortho-surgical interventions.

Keywords: Quality of life, Questionnaire, Dentofacial deformity, Orthognathic surgery

INTRODUCTION

The World Health Organization (WHO), in 1993, defines Quality of life (QoL) as "an individual's perception of their position in life in the context of culture and value systems. in which they live and about their goals, expectations, standards, and concerns."^[1] Nowadays, QOL is being given due significance in the medical and surgical fields. Its importance cannot be understated in facial orthognathic surgeries balanced faces are considered beautiful and are an important factor for successful interpersonal relationships. Dentofacial deformity is the deviation in the balance of orofacial structures, primarily affecting the jaws and teeth, and may involve multiple craniofacial structures.^[2] The psychological status of an individual is related to physical well-being of an individual and is directly related to QOL.

Literature reveals that there is a difference in QOL for patients with or without dentofacial deformities.^[3] Patients with noticeable dentofacial deformity are reported to be less pleased

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with their appearance as compared to otherwise normal patients.^[4] The demand for improvement in facial appearance, enhancement in masticatory function, and boosting self-confidence are the reasons for orthodontic consultation among these patients.^[5] The correction of dentofacial deformity involves ortho surgical intervention. At present, with advancements in the diagnostic technology and expertise of clinicians, orthognathic surgical procedures are safe and routinely followed patients opting for ortho surgical management generally have high expectations for improvement in QOL. There is a requirement to understand the patients' expectations to achieve successful results.

Inclusion of quality of life during the management of dentofacial deformities is relatively new in the field of orthognathic surgery. The employed methods include the orthognathic QoL questionnaire (OQLQ), which is condition specific questionnaire,^[6] the oral health impact profile, short form, with 14 questions,^[7] and the oral health status questionnaire. There has always been a need for a shorter form to reduce the time required to fill and at the same time to customize the questionnaire specific to the institution.

Hence, this study aimed to evaluate the QOL among patients undergoing orthognathic surgery using a customized questionnaire that encompassed not only the patients' perception of facial form, it also includes the patient perception of the overall quality of care provided during the entire treatment process.

MATERIAL AND METHODS

This prospective, qualitative, and observational study was carried out on 21 consecutive patients, who underwent ortho-surgical management for the underlying dentofacial deformity between January 2019 and March 2020. The study was approved by the Institutional Ethical Committee of Armed Forces Medical College, Pune and written informed consent was obtained from all patients.

The selected patients were in the age range from 18 to 35 years. Syndromic patients, including patients with Hemifacial microsomia, cleft lip, and palate, patients with cognitive disorders, or patients with a residual deformity resulting from tumor or trauma were excluded from the study.

A single team of orthodontists and maxillofacial surgeons were involved in the initial counseling of the patients and preparation as well as execution of the customized treatment plan. All patients were managed through a conventional approach, where presurgical orthodontics was carried out to decompensate the malocclusion, followed by the surgical phase, and finally, post-surgical orthodontics to settle the occlusion. The various surgical procedures carried out include Bi-jaw corrections [Figure 1], mandibular surgeries (Bilateral

sagittal split ramus osteotomy (BSSRO), advancement, setback, asymmetric rotations, genioplasty, and extraoral vertical ramus osteotomy (EVRO) (EVRO with genioplasty) [Figure 2] and maxillary surgeries (Le Fort osteotomies and Wassmund osteotomies used for advancement, superior repositioning and setback).

To ascertain the change in QoL, orthognathic OQOLQ was customized under the expert guidance of a senior psychologist. Patients were made to fill out the questionnaire in two stages: Phase I, immediately before surgical intervention; and Phase II, 6 months after orthognathic surgery (at the end of treatment). The questionnaire prepared was in three languages (English, Hindi, and Marathi), to suit the language best understood by the patient. The translated questionnaire was then validated in a sample of ten volunteers proficient in all three languages: Seven students in their final year at the department of dental surgery and three faculty members. After administration and collection of the questionnaires, responses were discussed with these volunteers to determine any misinterpretation or ambiguous terms.

Data collection

Each patient was asked to complete the self-administered customized questionnaire before surgery (Phase I) and 6 months postoperatively (Phase II). The Phase I questionnaire was designed to include information about patients' perceptions about his/her dentofacial deformity, their understanding, requirement, and awareness, about the treatment, to know their confidence level, social, and professional life, and QoL before surgery. Expectations from the treatment and post-surgical life were also included in the questionnaire.

Phase II questionnaire included information regarding patient's satisfaction after surgery, that is, change in looks,



Figure 1: Patient with skeletal class III malocclusion after presurgical orthodontics and before surgery who underwent maxillary advancement by Le Fort I osteotomy and mandibular setback through BSSRO and reduction genioplasty; (a) and (b) Pre-operative and post-operative lateral profile.



Figure 2: Patient with skeletal class II malocclusion with masseter muscle hypertrophy after presurgical orthodontics and before surgery who underwent mandibular advancement through extraoral vertical ramus osteotomy, masseter muscle debulking mandibular recontouring by osteoplasty and augmentation genioplasty using autologous graft from posterior mandible; (a) and (b) Pre-operative and post-operative lateral profile.

in social or professional life, and QoL after correction of dentofacial deformity. His/her experience during hospitalization, success following surgery, and the level to which expectations attained were also asked to all the participants. meeting after surgery.

Data analysis

Data acquired were analyzed by an independent researcher, who was not a part of the clinical team. The data were compiled and imported to a spreadsheet in Excel–Windows 10. The data were analyzed using statistical software SPSS version 20 (Inc., Chicago, IL). The analysis included use of Pearson Chi-Square test, Likelihood Ratio, Linear-by-Linear Association, McNemar-Bowker Test, and Wilcoxon Signed-Ranks Test. Paired *t*-tests were used to compare Phase I and Phase II, with the level of significance set to $P < 0.05$.

RESULTS

Twenty-one (nine males and 12 females) patients who underwent orthognathic surgery participated satisfactorily in the study. The age of the subjects ranged from 18 to 35 years, with a mean age of 25 years a 5.7-year standard deviation, and a variation coefficient of 22.80%. The patients included in the study underwent a wide variety of orthognathic procedures to correct underlying dentofacial deformity were bi-jaw corrections (with or without genioplasty) in 24% of cases, maxillary advancement or repositioning through Le Fort I osteotomy 20%, genioplasty 16%, mandibular advancement in 12% cases, mandibular setback in 8%, asymmetric mandibular rotations through BSSRO 8%, and mandibular rotation through EVRO with genioplasty in 4% of patients.

Seventy percent of the patients realized about the underlying problem in their teenage and most of the cases (80.95%) discerned the problem themselves, with parents, or with friends. “Esthetics” was the most frequently reported reason for seeking treatment, corresponding to 57.14% followed by functional discomfort in 42.80% in terms of chewing food and speech. No patient underwent psychological or speech therapy before or after the surgery.

The mean pre-/post-treatment difference for the oral function was found to be statistically and clinically significant, with post-operative improvement in four out of five items of the QLQ including the perception of smell ($P = 049$), perception of taste ($P = 025$), perception of breathing ($P = 000$), perception of speech ($P = 001$), and swallowing of food ($P = 001$). However, the efficiency of chewing hard food did not change significantly from pre- to post-surgery ($P = 066$) [Table 1].

Concerning the psychosocial aspect, statistical significance was found in terms of improvement in confidence levels ($P = 000$) and professional relationships ($P = 0.002$) [Table 2]. Pre- and post-operative comparisons for the perception of looks were found to be statistically significant using Wilcoxon Signed-Ranks Test and Test statistics.

When asked about their satisfaction concerning the surgical outcome, 61.90% stated that the surgical outcomes met all their expectations and 38.09% stated that most of their expectations were met. About 85.71% of patients considered surgery very successful; however, 14.3% of patients contemplated that it could have been better. However, none of the patients opted for other options, when asked about the success of the surgery whether unsuccessful, not as expected, or neutral responses.

Moreover, 19.04% of patients affirmed significant change in looks and appearance, 9% reported evident change in appearance and 42.85% stated that family and friends could notice the change in their appearance post-surgery. Patients reported positive experiences post-surgery in terms of good hospital care (33.3%), supportive doctors (28.57%), and regular follow-up (9.52%). About 14 of 21 patients had no negative experience to share post-surgery. Only 9.52% of the patients had reservations regarding general ward maintenance and 9.52% considered untidy washrooms as their negative encounter during hospital stay.

DISCUSSION

QoL has been defined by the WHO as “individuals’ perception of their position in life in the context of the culture and value systems in which they live and concerning their goals, expectations, standards, and concerns.”^[7] It is a broad-ranging concept affected in a complex way by the person’s physical health, psychological state, level of independence, social relationships, personal beliefs, and their relationship

Table 1: Pre and post op comparison of oral functions using paired samples test.

Pair of items pre-operative and post-operative		Paired differences				t	df	Sig. (2-tailed)	
		Mean	SD	Standard Error Mean	95% Confidence				
					Lower				Upper
Pair 1	Perception of smell	-368	0.761	0.175	-735	-002	-2.111	18	0.049
Pair 2	Perception of taste	-545	1.057	0.225	-1.014	-077	-2.421	21	0.025
Pair 3	Perception of breathing	-909	0.921	0.196	-1.317	-501	-4.629	21	0.000
Pair 4	Perception of speech	-1.000	1.195	0.255	-1.530	-470	-3.924	21	0.001
Pair 5	Swallowing of food	-818	1.006	0.215	-1.264	-372	-3.813	21	0.001
Pair 6	Chewing of hard food	-455	1.101	0.235	-943	0.034	-1.936	21	0.066

SD: Standard deviation

Table 2: Pre and post op comparison of confidence levels and professional relationship using paired samples test.

Pair of items pre-operative and post-operative		Paired differences				t	df	Sig. (2 tailed)	
		Mean	SD	Standard Error Mean	95% Confidence				
					Lower				Upper
Pair 1	Confidence levels	-1.86364	0.99021	0.21111	-2.30267	-1.42460	-8.828	21	0.000
Pair 2	Rating professional relationship	-682	0.894	0.191	-1.078	-266	-3.578	21	0.002

to salient features of their environment.^[8] Morphological deformities of the orofacial complex affect the confidence and physical appearance and have a direct impact on the sociopsychological behavior of an individual; hence, the QOL is affected or compromised.^[9] The impact of dentofacial deformities on an individual's social and emotional life has been an emphasis of research for a long time.^[5,10,11]

The present study was designed to observe and quantify the impact of the ortho-surgical correction of the dentofacial deformity, employing a two-phase condition-specific questionnaire customized to tap into the various areas of concern for patients and to record if there was a quantifiable change in QOL following surgery.

Questionnaires were applied on 1-2 days before surgery and 6 months post-surgery. When the phase II questionnaire was obtained, the edema subsides, and bone structures consolidate, there is better visualization of facial esthetics, there is a positive change in oral function, and the patient usually returns to social life.^[12-14]

In the present study, 28 pre-operative and 18 post-operative parameters were used to assess the patient's psychological, physiological, psychosocial, functional, social, and general perception toward the doctors and paramedical staff which will provide us broader based parameters to assess the impact of such surgeries on the post-operative QoL of ortho-surgical patients. In the present study, most cases were young adults with the age ranging from 18 to 35 years, with a mean of 25 years. Esthetics was the most frequently reported reason for seeking treatment, corresponding to 58% followed by functional discomfort in 42% in terms of chewing food and speech which ratifies the fact

affirmed by Charrier^[15] and Finlay *et al.*^[16] in their studies that in some patients' esthetic amelioration form the most important aspect of contemplated orthognathic surgery.

The results of our study with respect to improvement in QOL and psychosocial aspects (improvement of confidence levels, professional relationships) at 6 months after orthognathic surgery are consistent with similar studies conducted in the past, which have demonstrated that improvement of facial appearance influences social interactions.^[17-19] However, no study has considered the wide range of parameters as has been done in our study, which facilitates a holistic assessment of technical, functional, as well as psychological aspects for patients undergoing orthognathic surgery. Esthetic and social aspects improved significantly in the present study which concurs with longitudinal studies carried out by Kiyak *et al.*^[20] and Cunningham *et al.*^[5]

In our study, the improvement in the perception of smell followed by the perception of taste received the lowest score among the subjects, the results similar to those obtained by Sanger and David^[21] and Gent *et al.*^[22] It has been hypothesized that an altered shape of the nasal passage, either by a change in the shape of the external nares or a change in the shape of the internal architecture of the nose as a result of maxillary repositioning, might influence the ability of odorant molecules to come in contact with the olfactory epithelium, thereby altering olfaction.^[21,22] Various studies have reckoned that by improving occlusion, orthognathic surgery also affects functional capacity and the same was deduced by us, statistically, significant scores were observed

in improvement of perception of breathing, perception of speech, and swallowing of food post-surgery.^[23-26]

The present study evaluated the effect of orthognathic surgery on speech, breathing, swallowing, and chewing of food. A statistically significant correlation was found in the improvement of speech, breathing, and swallowing. The questionnaire designed for the present study has been specifically formulated for the holistic evaluation of patients undergoing orthognathic surgery.

The understudy patients were all treated in a government-run tertiary care hospital in southern India, with no financial liability to the patients. Patients reported positive experiences post-surgery in terms of good hospital care (33.3%), supportive doctors (28.57%), and regular follow-up ward rounds (9.52%). A total of 66.66% of patients had no negative experience to report, and only 9.52% considered untidy washrooms as their negative encounter during hospital stay and general ward improvement. Both positive and negative experiences should be considered crucial, as they have a substantial effect on the psychological aspect of the patient, thus affecting their post-operative recovery and healing.

Dialogue between the ortho-surgical team and patient and parents, before treatment, immediately before surgery and after surgery helps to understand the expectations, psychology, and social life of the patient, thereby preparing the team to understand their patients at the same time aid the individual to recover sooner which will, in turn, improve the overall QOL. The problems faced by the patient psychologically and socially can be assessed by the QOL questionnaire resulting in a healthy surgeon-patient relationship and establishing a bond of trust and confidence in their treating clinicians as well as treating facilities.

Limitations of the study

The duration of this present study is short, that is, 1 year and 3 months which could have been further increased and we envisage that use of our questionnaire in a similar, broad-based multicentric study with a larger patient base, will help in gaining a more holistic approach toward planning as well as aid in improving the overall outcome of ortho-surgical interventions.

CONCLUSION

Our research which was carried out using a specially designed orthognathic surgery-specific OQLQ, specifically aimed at patients' perception, inferred that orthognathic surgery has a positive impact on the patient's facial appearance and oral function and improves social facets such as self-confidence and self-esteem. The patient's psychological state may be favorable or unfavorable during recovery, influencing their QoL, self-esteem, and appearance satisfaction. This very

important aspect of the "patients' perspective" of treatment being imparted is often neglected by the ortho-surgical team, the immense importance of which has been duly reflected in our study.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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