

Evaluation of Patients' Satisfaction after Class III Orthognathic Surgery

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ABSTRACT

Background: Well-planned orthognathic surgery improves psychological health, aesthetics and function of patients.

Aim: The present study aimed to investigate patients' satisfaction after orthognathic surgery by means of a satisfaction questionnaire before and after surgery.

Materials and Methods: A total of 29 patients was selected (17 women and 12 men), with a mean age of 28 years, randomly selected from a private clinic at Araçatuba – São Paulo by two investigators. Anamnesis and clinical examination were performed. Subjects with facial deformities submitted to orthodontic treatment before and after orthognathic surgery

with a minimum post-surgery period of 6 months, answered a satisfaction questionnaire composed of 10 questions regarding dental and facial aesthetics. In this study, the maximum satisfaction score was 10.

Results: Regarding aesthetics, two satisfaction parameters were investigated: dental and facial. For all indices, the average satisfaction was up to score 7.

Conclusion: According to the results, it can be concluded that orthognathic surgery has been an effective treatment for dentofacial deformities, aesthetics and functional problems, what was verified by pre and postoperative questionnaire application.

Keywords: Aesthetic, Class III Angle's classification, Psychology

INTRODUCTION

Orthognathic surgery aims to correct dentofacial deformities and its importance lies on the adjustment of both occlusion and facial aesthetics. This treatment also influences patient's psychosocial aspects since the facial appearance affects the body image formation, identity and self-esteem [1]. Facial deformities with destructive psychological and social potentials, creates negative impacts on patients' confidence, as well as on their external relationships, resulting in social and psychological problems [2-5].

In orthognathic surgery, common procedures are used in patients with skeletal class II and III deformities, such as dentomaxillofacial malformations, correction of mandibular laterognathia and maxillofacial asymmetry, aiming to correct aesthetics and function (mastication, phonetics and respiration) [6-8].

Patients subjected to surgical correction seek to solve their psychosocial and physical disabilities in order to improve their appearance [9]. Thus, the dentofacial deformity reparation process involves both technical and psychosocial aspects and demands patient's cooperation and a multidisciplinary team [10-12]. When such aspects are neglected by the professional, patient's dissatisfaction with postsurgery psychological problems may occur. In this situation, the professional team can lately understand that the treatment failure may result from the lack of preliminary psychological evaluation and proper treatment plan [13-17].

Power et al investigated the perception of subjects' quality of life from 15 different cultures and the self-esteem was the most scored factor in psychological domain [18]; therefore, it is very important to evaluate these factors. Several studies stated that according to subjects' perceptions about themselves, their physical and emotional status are important indicators to define the treatment plan and denote the interrelationship among oral health, general health and quality of life [19,20].

Considering the influence of psychosocial factors in the treatment of dentofacial deformities and the impact of orthognathic surgery on patient's appearance after surgery completion, the patients can recover their self-esteem and improve social life. So, the aim of the

current study was to investigate the psychosocial aspects related to facial appearance changes in patients with dentofacial disharmony undergoing orthognathic surgery, through the application of a satisfaction questionnaire before and after surgery.

MATERIALS AND METHODS

After approval by the Research Ethics Committee on Human 003/2010, a total of 29 subjects (17 women and 12 men) with a mean age of 28 years were randomly selected from a private clinic at Araçatuba – São Paulo by two investigators. Surgeries were performed between 2010 and 2014, at the Municipal Hospital of the City of Araçatuba in association with the Faculty of Dentistry of Araçatuba Unesp (Brazil).

Inclusion criteria

- Patients with Angle's class III classification.
- Good overall health assessed through laboratory exams (complete haemogram; full coagulation; blood glucose; urea and creatinine), and cardiac evaluation (electrocardiography, radiography, panoramic RX and tomography).
- Patients with more than 24 natural teeth.
- Asymptomatic subjects through the research diagnostic criteria (RDC)/temporomandibular disorder (TMD) questionnaire [21].

Exclusion criteria

- Individuals with extra and intraoral pathologies in soft or hard tissue.
- Presence of oral prosthesis; periodontal problems; systemic disease.
- Patients with Angle's Class I or II malocclusion.
- Patients smoking more than 10 cigarettes.

Patients' selection was performed through anamnesis and clinical examination, and only dentate subjects. Patients with facial deformities subjected to orthodontic treatment before and after orthognathic surgery (single jaw surgery) with a minimum postsurgery period of 6 months were included.

Patients presenting Angle's Class III malocclusion: Orthodontic treatment was performed before surgery to better teeth positioning. The operations occurred about one year after orthodontic treatment. The orthognathic surgery consisted of a cut bone made inside the mouth, called bilateral sagittal splinting Ramus osteotomy (BSSRO) and the decision is based on skeletal discrepancy.

The 29 subjects were asked to fill out a questionnaire in order to investigate their satisfaction degree after orthognathic surgery [22,23], according to an adapted (20 cm) visual analogue scale (VAS) [Table/Fig-1]. The questionnaire [Table/Fig-2] was composed of 10 questions from "A" to "J" and evaluated patient's satisfaction regarding dental and facial aesthetics, smell perception, breathing, speech, chewing and swallowing food, overall satisfaction degree, surgery cost/benefit ratio and if the surgery benefit has overcome patient's sacrifice.

The results of above related groups, on patient's satisfaction were analysed before and after orthognathic surgery. The analysis of the results before and after surgery was related by the affinity of the



[Table/Fig-1]: Adapted Visual Analogue Scale (VAS) of 20 cm ranging from -10 to +10

The answers about their perception after orthognathic surgery completion are of paramount importance to us.

Remember to compare your situation today, after orthognathic surgery, and prior to orthognathic surgery.

Draw a vertical line with a pen on the line of satisfaction, according to each topic mentioned below.

INFORMATION POINT: Visual Analogue Scale (VAS)

Example:

Are you satisfied?



Less satisfied - + More satisfied

Interpretation: On the dash above it follows that the customer has not reached the level of satisfaction of 50%

Topics:

A) Are you satisfied with your facial aesthetics?



Less satisfied - + More satisfied

B) Are you satisfied with your dental aesthetics?



Menos satisfeito - + More satisfied

C) Are you satisfied with your perception of the smells?



Less satisfied - + More satisfied

D) Are you satisfied with your breathing?



Less satisfied - + More satisfied

E) Are you satisfied with your bite?



Less satisfied - + More satisfied

F) Are you satisfied with your perception during speech?



Less satisfied - + More satisfied

G) Are you satisfied with your perception when swallowing food?



Less satisfied - + More satisfied

H) Are you satisfied with the cost-benefit of the surgery?



Less satisfied - + More satisfied

I) The benefit of orthognathic surgery supplanted the sacrifice?



Less satisfied - + More satisfied

J) What's your overall satisfaction?



Less satisfied - + More satisfied

Thank you for your attention!

[Table/Fig-2]: Questionnaire to investigate the satisfaction degree after orthognathic surgery

following patient satisfaction groups: 1 (Smell) x 2 (Speech) x 3 (Swallowing) x 4 (Chew) and 5 (Breathing).

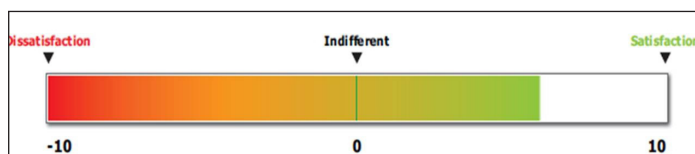
The questionnaire was posted into a website (www.ortosurgeryfoa.com.br), created exclusively for this study, and the link was sent via email (lidiapima@hotmail.com) to the patients.

The questionnaire was based on the needs reported by patients to restore aesthetics and function, which led them to accept this type of surgery and on some questionnaires already mentioned by some authors in literature [13,18,22]. This questionnaire was prepared and written by the authors of this study with their due copyright. Before emailing the site link, patients were contacted via phone to accept the term of informed consent in accordance with the recommendations of Human Research Ethics Committee.

In order to answer the questionnaire, patients demarcated the scale with a mouse point in which the left side corresponded to



[Table/Fig-3]: Example of scored result in which the left marked side corresponds to the degree of dissatisfaction



[Table/Fig-4]: Example of scored result in which the right marked side corresponds to the degree of satisfaction

		df	SS	MS	F	p*
Groups	4	69.933	17.483	73.1761	0.005	S
Error	140	33.449	0.239			

[Table/Fig-5]: Results of ANOVA for 1 (Smell) x 2 (Speech) x 3 (Swallowing) x 4 (Chew) and 5 (Breathing)
*p < 0.05 denotes statistically significant difference. S: Significant

FACTORS VARIATION	SQ	p VALUE	SIGNIFICANCE
(1x2)	12.7805	< 0.01	S
(1x3)	7.9327	< 0.01	S
(1x4)	22.1456	< 0.01	S
(1x5)	4.0765	< 0.05	S
(2x3)	4.8478	< 0.01	S
(2x4)	9.3650	< 0.01	S
(2x5)	8.7040	< 0.01	S
(3x4)	14.2128	< 0.01	S
(3x5)	3.8562	> 0.05	Ns
(4x5)	18.0690	< 0.01	S

[Table/Fig-6]: Medium values for satisfaction degree (Tukey Test)
S: Significant; Ns: No significant.

		df	SS	MS	F	p*
Groups	1	0.284	0.284	5.4812	0.0215	S
Error	56	2.904	0.052			

[Table/Fig-7]: Results of ANOVA for satisfaction degree: Cost/Benefit versus Benefit/Sacrifice
*p < 0.05 denotes statistically significant difference. S: significant

		df	SS	MS	F	p*
Groups	1	0.013	0.013	0.1527	0.6995	Ns
Error	56	4.785	0.085			

[Table/Fig-8]: Results of ANOVA for satisfaction degree: Dental Aesthetics versus Facial Aesthetics
*p < 0.05 denotes statistical significant difference. Ns: no significant.

the dissatisfaction [Table/Fig-3] and the right side; to satisfaction score [Table/Fig-4]. The output answers were analysed online via PHP language and Javascript. The questionnaire was completed by patients before and after six months of orthognathic surgery. Data was sent to the examiners and tabulated.

STATISTICAL ANALYSIS

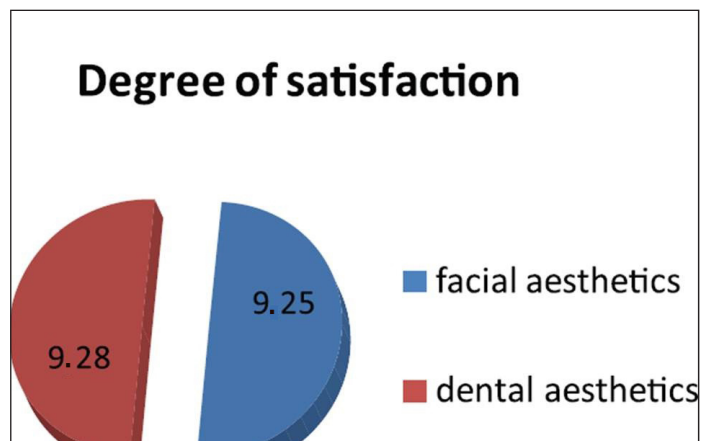
The means were calculated for each group and the results were submitted to one-way ANOVA test and Tukey test at 5% significance level (Statistical software IBM SPSS statistic 22 IBM, Chicago, IL, USA).

RESULTS

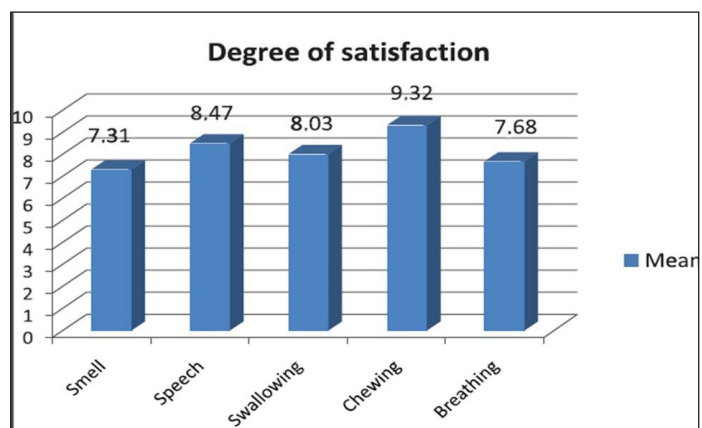
Analysis of variance (ANOVA) for satisfaction degree among: 1 (smell); 2 (speech); 3 (swallowing); 4 (chew); 5 (breathing) showed statistically significant difference for all groups (p=0.005) [Table/Fig-5]. When comparing satisfaction degree between one groups with each other, only the comparison between groups 3 and 5 presented no statistically significant differences in Tukey test [Table/Fig-6]. [Table/Fig-7] showed statistically significant difference between the satisfaction degrees for Cost Benefit and Cost Sacrifice (p = 0.0215). There was no significant statistical difference between the satisfaction degrees of dental aesthetics and facial aesthetics [Table/Fig-8].

Regarding aesthetic factor, two parameters were investigated: dental and facial satisfaction. The values varied between -10 (minimum) to 10 (maximum). The average value of satisfaction was favourable and similar, ranging from 9.25 to 9.28 for dental and facial aesthetics, respectively [Table/Fig-9].

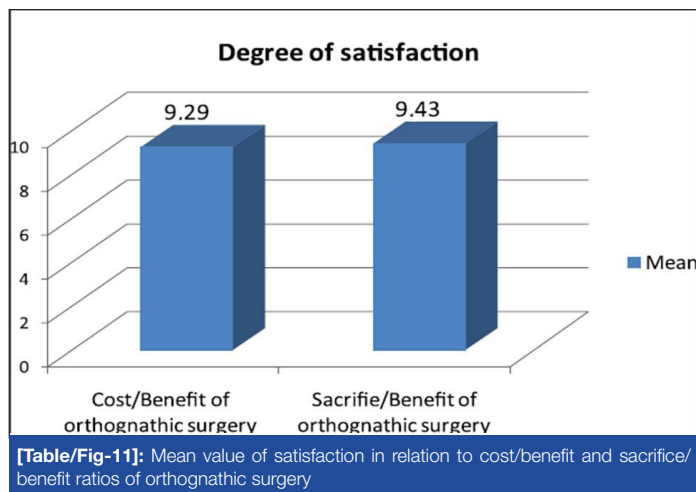
The functional improvements showed high satisfaction degrees, with 7.31 for odor perception, 8.47 for speech, 8.03 for swallowing, 9.32 for chewing and 7.68 for breathing [Table/Fig-10]. Another favourable result was that the surgery benefits exceeded the patient



[Table/Fig-9]: Mean value of satisfaction in relation to dental and facial aesthetics



[Table/Fig-10]: Mean value of satisfaction in relation to smell, speech, swallowing, chewing and breathing



sacrifice and the average satisfaction was 9.43. The cost/benefit ratio of surgery also received a high value of satisfaction degree (9.29) [Table/Fig-11].

DISCUSSION

In this study, the evaluation of patient satisfaction was performed 6 months postsurgery because by this time patients were without oedema, had resumed their daily, professional and social activities, and had adapted to their new image. It was believed that earlier evaluation could influence the results of patient's satisfaction.

Results found in this study about patients satisfaction in relation to aesthetic and psychological factors after orthognathic surgery are in accordance with the study of Rustemeyer et al., [23]. Most of the patients expressed their degree of satisfaction as a result of orthognathic surgery which indicates that significant aesthetic and functional changes occurred after surgery. In some cases, patients expressed indifference regarding their satisfaction; in other words, those patients did not observe improvement or worsening of functional and aesthetic sources. It may have occurred due to an unexpressive change in appearance or because the patients had no sensitivity to observe such changes since the problem was latent and the adaptation to it was not expressed in limiting symptoms to their social life.

Our society has imposed strong appeal for aesthetic appearance. Studies [24-26] have shown that subjects with good dentofacial appearance are more attractive, outgoing, interesting and belonging to high social class [24]. This concept is inserted into human mind and therefore, aesthetics will always be the most requested requirement during facial treatments [25]. This situation was evident in the current study in which the question regarding dental and facial aesthetics was the most scored.

Some studies claimed that aesthetics is the most important aspect for several patients when compared to functional aspects [27]. It is imperative to show the possible aesthetic and functional changes to the patients and to sensitize them for the changes by stimulating their self-understanding. This would improve the capacity of perception and satisfaction degree, which would increase the importance of our profession.

The smell perception received the lowest score. The small change in this factor was probably noted by the patients after surgery. These results are consistent with the previous study of Walker et al., in which the smell perception did not significantly change after 6 months of orthognathic surgery [26].

The masticatory function basically consists of grinding, salivation and food handling into the oral cavity [28]. In the present study, this factor received high satisfaction score which corroborates with other studies [29,30].

The findings of this study demonstrated that the orthognathic surgery improved the patient's quality of life. The investigation

of surgeries aesthetic outcomes is very pertinent since patient's satisfaction is the predominant factor in determining treatment success [31]. A positive outcome was observed on the results of cost/benefit and benefit/sacrifice ratios of the present treatment. Therefore, it is possible to infer that the orthognathic surgery treatment was successfully employed in the current patients.

Despite technical improvements and equipment progress that have made orthognathic surgery much faster and simpler than it used to be, patient dissatisfaction with the results can still be regarded as a disadvantage [32,33]. Even in the most successful cases, patients' preoperative expectations orthognathic surgery and postoperative outcome could offer discrepancies, unsatisfactory results and possible postsurgical discomfort [34]. The relationship between satisfaction and psychosocial functioning after orthognathic surgery from a clinical point of view may not be as satisfying aspect of the patient [35].

In this study, the maximum satisfaction degree was score 10. For all indices, the average satisfaction was up score 7, which shows that orthognathic surgery has been, since then, an effective treatment with a high degree of satisfaction to solve dentofacial deformities, aesthetic and functional problems. Professionals must keep alert to facial analysis, especially in terms of tegumental harmony, so that the orthognathic surgery may re-establish, satisfactorily, the facial aesthetics in all parameters [36].

Orthodontic treatment combined with orthognathic surgery presented positive results not only in dealing with aesthetic and functional components of dentofacial deformities, but also when considering patients' psychological aspect. Both influence in patient's greater motivation, perception and expectations in obtaining surgical success and psychological improvement [37].

In order to ensure aesthetic results before surgical repositioning of the skeleton and/or dento-osseous segments, the surgical procedure must be performed before orthodontic treatment, since the surgery promotes a facility for performing tooth movement. Improved patient's facial aesthetics and dental function in early treatment also improves the patient's swallowing and speech. The orthodontic process promotes movement on a much faster rate after surgery as well as reduces the total treatment time, brings better patient's cooperation during orthodontic treatment, besides facilitating orthodontic movement of functional and anatomical relationships in the region to be restored [6].

LIMITATIONS

The limitations of the study are pointed as follows: small number of patients; the high cost of treatment; no association of the professional in speech therapy and rehabilitation for all patients; Visual Analogue Scale (VAS) questionnaire limitation. The visual analogue scale (VAS) is considered of simple understanding and filling for patients and easy data tabulation for operators, however, one of its limitations is the subjective evaluation of patients, non-understanding of the scale (VAS), no quantitative data, and the figures cannot easily be directly measured or interpreted [22,38].

Therefore, it is suggested that in future studies separated issues should be related to dentofacial deformity, functional and aesthetic with their preoperative and postoperative satisfaction or dissatisfaction.

CONCLUSION

Based on the outcomes and limitations of the present study it was concluded that most of the patients who underwent orthognathic surgery showed a high degree of satisfaction for both aesthetic (facial and dental) and occlusal (chewing) aspects.

For all indices, the average satisfaction was up to score 7, which shows that orthognathic surgery has been, since then, an effective way with a high satisfaction degree to solve dentofacial deformities, and aesthetic and functional problems.

The clinical relevance of this manuscript is the positive results, making this type of orthognathic surgery successfully indicated for patients with Angle's Class III malocclusion. The way the questionnaire was applied (using Web site and answered by e-mail) was a success. Results were easily and entirely collected.

Conflict of interest: No author has a financial or proprietary interest in any material or method mentioned.

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