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ORIGINAL ARTICLE

Satisfaction survey of secondary rhinoplasty among unilateral cleft lip and palate patients

Enquête de satisfaction après rhinoplastie secondaire chez les patients porteurs de fente labio-palatine unilatérale totale

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KEYWORDS
Cleft nose deformities;
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Patient satisfaction

Summary Secondary rhinoplasty on patients with cleft is a challenging procedure, and the most important criterion for evaluating the surgery success is patient satisfaction even if it's subjective.

Objectives. — To evaluate patient satisfaction following secondary cleft rhinoplasty with a specific assessment for patients with Unilateral Cleft Lip and Palate (UCLP).

Patients and methods. — Our retrospective cross-sectional study is composed of 29 patients with UCLP with a mean age of 23 years old, who underwent secondary rhinoplasty between 2010 and 2021 in our department. The survey was conducted postoperatively using a cleft-nose specific custom designed questionnaire based on the Byrne questionnaire, over the phone. This satisfaction questionnaire comprises six questions about physical appearance and one question about functional aspect. Patients were asked to answer ''yes'' or ''no'' or to rate from 0 (no improvement) to 10 (perfect result) depending on the question.

Results. — Twenty out of 29 people responded to the questionnaire, representing an answer rate of 69%. The average score given by the patient for nasolabial scar improvement was 7.2/10, and the one concerning global improvement was 8.2/10. All patients would be ready to undergo the same procedure again, knowing the final result. A functional improvement concerning breathing

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or snoring was reported in 45% of cases. All dorsum or tip issues were improved after surgery ($P = 0,07$).
Conclusions. — Our results demonstrate high patient satisfaction after cleft rhinoplasty, which encourages the continuation of this surgery. We would recommend the use of this simple questionnaire to allow a more accurate evaluation of patient outcomes.

MOTS CLÉS
Fente labio-palatine unilatérale ;
Rhinoplastie secondaire ;
Satisfaction des patients

Résumé La rhinoplastie secondaire chez les patients porteurs de fente est une procédure difficile, et son succès est directement corrélé à la satisfaction du patient, même si elle est subjective.
Objectifs. — Évaluer la satisfaction des patients présentant une fente labio-palatine unilatérale totale (FLPUT) après une rhinoplastie secondaire.
Patients et méthodes. — Nous avons mené une étude rétrospective transversale composée de 29 patients porteurs de FLPUT ayant bénéficié d'une rhinoplastie secondaire entre 2010 et 2021 dans notre service. L'enquête a été réalisée en postopératoire par téléphone à l'aide d'un questionnaire dédié aux patients porteurs de fente, inspiré du questionnaire de Byrne. Ce dernier comprend six questions sur l'aspect esthétique du nez et une question sur l'aspect fonctionnel.
Résultats. — Sur 29 patients, 20 ont répondu au questionnaire, soit un taux de participation de 69 %. L'amélioration de la cicatrice nasolabiale a été en moyenne évaluée à 7,2/10, et celle concernant l'amélioration globale était de 8,2/10. Tous les patients seraient prêts à subir à nouveau la même procédure, en connaissant le résultat final. Une amélioration fonctionnelle concernant la respiration ou le ronflement a été rapportée dans 45 % des cas. Le dorsum ou la pointe ont systématiquement été améliorés après la chirurgie, lorsque le patient en avait demandé la correction en préopératoire ($p = 0,07$).
Conclusions. — Nos résultats démontrent une grande satisfaction des patients après une rhinoplastie pour fente, ce qui encourage la poursuite de cette chirurgie. Nous recommandons l'utilisation de ce questionnaire simple pour permettre une évaluation plus précise des résultats des patients.

Introduction

Deformities associated with cleft nose are considered as one of the most challenging reconstructive problems in rhinoplasty. Patients with Unilateral cleft lip and palate (UCLP) mainly present significant nose asymmetry, enlarged tip, insufficient tip projection, deviation of the columella and anterior caudal septum to the uncleft side. Concerning the cleft side, there is frequently a displaced alar foot, a flattened and horizontalized nostril, and a caudal hood of the lower lateral cartilage. Those complex nasal sequelae are related to three combined mains factors: type and severity of congenital anatomic deficiency, surgical scars from previous surgeries, and changes related to growth [1,2].

As surgical techniques have improved over the years, surgeons have tried to achieve superior aesthetic and functional outcomes. The goal of secondary rhinoplasty is to achieve a nose that does not conserve the sequelae of the cleft. However, postoperative results of secondary cleft rhinoplasty are considered inferior to the results of the non-cleft rhinoplasty population and may therefore form a source of dissatisfaction for the patient and the surgeon [3].

Clefts patients often benefit from secondary cleft rhinoplasty at adolescence or adulthood, when maximal growth has been attained. At this stage of life, the psychosocial impact of attractiveness and the functional aspect of the nose are very important for the quality of life. Objective assessment of secondary rhinoplasty results is related in many articles. Despite such evaluations reliability, the assessment of patient subjective satisfaction prevails, as it represents the ultimate goal of any procedure. There is currently no wide adoption of a scale dedicated to subjective evaluation of patient satisfaction after secondary rhinoplasty. Among literature, the specifically designed semi-structured questionnaire of Byrne [4] is to this date the only one to assess specifically patients with UCLP satisfaction and inspired the custom-designed questionnaire used in this study.

In an attempt to obtain a complete, precise, repeatable and reliable evaluation of patient subjective satisfaction, a new questionnaire was designed to retrospectively assess patient aesthetic and functional satisfaction after secondary rhinoplasty.

Material and methods

Design and patients

This retrospective study was conducted in a referenced cleft center. The patient could be included if they presented a non-syndromic UCLP and if they had undergone a secondary rhinoplasty after the age of 16, by one of the two surgeons

qualified for cleft surgery. Photographic and demographic data (age, sex) were collected. Medical and cleft surgical history, as lip, palate or nose surgeries, were documented. Surgical reports were screened to collect relevant information about rhinoplasty techniques.

Patients who declined to participate in the study or those who were unreachable were excluded. Written informed consent was given by the patient or their legal guardian before the publication or use of any relevant information and images. The study is approved by the local ethics committee (CE-2020-65) and was carried out in accordance with the guidelines of the Declaration of Helsinki regarding the ethical principles for medical research involving human subjects.

Patient questionnaire

In October 2021, a questionnaire was communicated over the phone to all patients with UCLP who had undergone a secondary rhinoplasty from January 1, 2010 to October 1, 2021. The questionnaire designed for this study (Fig. 1) was inspired from the specifically designed semi-structured questionnaire of Byrne (Fig. 2), and translated into French. The last question ''whose nose would you most desire to have?'' was withdrawn. The patients were questioned about which part(s) of the nose bothered them the most before the surgery and which part had been the most improved. They could choose one of the following ''tip'', ''nostril'', ''dorsum'', ''columella'' for these two questions. Then, they were asked: if they would undergo the surgery again knowing the final result, if surgery has improved function (breathing and snoring), and which side of the nose they prefer (front, side or both). They also had to rate the appearance of their resultant scar from 0 (no amelioration) to 10 (almost invisible), and their global satisfaction from 0 (no amelioration) to 10 (desired nose).

Statistical analysis consisted of averages and standard deviation calculations and were conducted using Excel 2021 (Microsoft, Redmond, Washington, USA).

Results

Patients characteristics

A total of 29 patients with UCLP underwent secondary rhinoplasty from 2010 to 2021, in the cleft surgery center. The questionnaire was delivered to 20 patients representing an answer rate of 69%. The remaining patients were unreachable. The male/female incidence was 4/16, the average age at the time of secondary surgery was 24.5, ranging from 16 to 46. The mean duration between the evaluation of satisfaction and the rhinoplasty was 33 months ranging from 6 to 96 months. Patients received an extern-approach rhinoplasty conducted by one of the two surgeons qualified in cleft surgery. The surgery involved the use of septal cartilage graft in 15 cases, with a Millard fork advancement flap [5], or Rethi approach [6]. The remaining patients had a Talmant secondary cheilorhinoplasty (Talmant, Talmant, and Lumineau 2012). Both techniques were used by the two surgeons and the most appropriate technique was selected in accordance with the patient, depending on the nose deformities.

Patient satisfaction after secondary rhinoplasty

Patient responses to the questionnaire are shown in Table 1. All patients answered positively to the question if they would be prepared to undergo the operation again, knowing the

BYRNE QUESTIONNAIRE MODIFIED BY DISSAUX AND ASSOULINE		
	Question	Answer
1	**Which part(s) of nose bothered you most preoperatively?**	
	1 : Tip	Yes : 1 / No : 0
	2 : Nares	Yes : 1 / No : 0
	3 : Dorsum	Yes : 1 / No : 0
	4: Columella	Yes : 1 / No : 0
2	**Which part(s) has been most improved by surgery?**	
	1 : Tip	Yes : 1 / No : 0
	2 : Nares	Yes : 1 / No : 0
	3 : Dorsum	Yes : 1 / No : 0
	4: Columella	Yes : 1 / No : 0
3	**Would you undergo the surgery again, knowing the final result?**	Yes : 1 / No : 0
4	**Which view of the nose do you prefer ?**	Face : 1 / Side : 0 / Both : 2
5	**Rate the resultant scars postoperatively on a scale of 0 to 10**	From 0 : no improvement à 10 : almost invisible
6	**Rate improvement on a scale of 0 to 10**	From 0 : no improvement to 10 : desired outcome
7	**Has surgery improved function (breathing & snoring)?**	Yes : 1 / Non : 0

Figure 1 Patient satisfaction assessment questionnaire.

SPECIFICALLY DESIGNED SEMI-STRUCTURED QUESTIONNAIRE OF BYRNE		
	Questions	Answer
1	Would you undergo the surgery again, knowing the final result?	Yes / No
2	Which part of nose bothered you most preoperatively?	Open-ended
3	Which part has been most improved by surgery?	Open-ended
4	Has surgery improved function (breathing & snoring)?	Yes / No
5	Which view of the nose do you prefer (front or side)?	Front / Side
6	How do you find the resultant scars postoperatively?	Like / Dislike
7	Rate improvement on a scale of 0 to 10 (where 0 = no improvement, 10 = the desired outcome)	From 0 (no improvement) to 10 (the desired outcome)
8	Whose nose would you most desire to have?	Celebrity name

Figure 2 Reproduction of the specifically designed semi-structured questionnaire of Byrne.

final result. The anatomic part that bothered the most the patients was the nostrils, with 70% of patients complaining about their horizontal and asymmetric shape. Tip and columella bothered respectively 45% and 40% of patients preoperatively. The most improved parts after surgery according to patients were the nostrils and tip with respectively 80% and 70%, followed by the columella and the dorsum with respectively 45% and 35%. The preferred nose

Table 1 Results of the questionnaire (questionnaire inspired from Byrne and modified by Dissaux and Assouline).

Question	Answer: 0		Answer: 1		Answer: 2		Average rate of 0 to 10	Standard deviation SD
	Number	Percentage	Number	Percentage	Number	Percentage		
Which part(s) of nose bothered you most preoperatively? (Yes:1; No:0)								
1: Tip	11	55%	9	45%				
2: Nares	6	30%	14	70%				
3: Dorsum	18	90%	2	10%				
4 Columella	12	60%	8	40%				
Which part(s) has been most improved by surgery? (Yes:1; No:0)								
1: Tip	6	30%	14	70%				
2: Nares	4	20%	16	80%				
3: Dorsum	13	65%	7	35%				
4 Columella	11	55%	9	45%				
Would you undergo the surgery again, knowing the final result? (Yes:1; No:0)	0	0%	20	100%				
Which view of the nose do you prefer? (Side:0; Face:1; Both 2)	5	25%	9	45%	6	30%		
Rate the resultant scars postoperatively on a scale of 0 to 10							7.2	2.35
Rate global improvement on a scale of 0 to 10							8.2	0.83
Has surgery improved function (breathing & snoring)? (Yes:1; No:0)	11	55%	9	45%				

view according to the patients was the ''face view'' with 45% of patients, followed by ''both face and profile view'' (30%) and ''profile view'' (25%). If dorsum or tip was bothering patients before surgery, it was corrected in 100% of cases ($P = 0,07$). Concerning nostrils and columella the deformities were corrected in respectively 85% ($P = 0,6$) and 57% ($P = 1$).

The average score given by the patient for nasolabial scar improvement was 7.2/10 (Standard Deviation SD 2.35), and the one concerning global improvement was 8.2/10 (SD 0.83). A functional improvement concerning breathing and snoring was reported in 45% of cases. For all surgical techniques used, there were no significant different results.

Discussion

Previous accepted outcomes measures after secondary cleft rhinoplasty were objective anatomic measurements [7]. These aspects are valuable but are no longer the gold standard, because patient satisfaction is now considered as the most important success criteria [3].

The purpose of this study was to assess patient satisfaction after secondary rhinoplasty in patients with UCLP. This is one of the rare studies, to date, to analyze patient satisfaction after secondary cleft rhinoplasty during adulthood with a custom-designed scale allowing precise specific and repeatable assessment for the patients with UCLP.

Several subjective assessment scales are described in literature but most of them, as the Rhinoplasty Outcome Evaluation Questionnaire (ROE) [8], the Nasal Obstructive Symptoms Evaluation Scale (NOSE) [2], the Utrecht questionnaire [9], or the Nasal Appearance and Function Evaluation Questionnaire (NAFEQ) [10] are dedicated to rhinoplasty or rhinopoïesis, but not specifically designed for secondary cleft rhinoplasty. Thus, this new questionnaire was set up for this study and was inspired from the specifically designed semi-structured questionnaire of Byrne [4]. This is the only questionnaire designed for cleft lip patient evaluation after secondary rhinoplasty. To improve this questionnaire and get a more accurate assessment, some modifications were required. The authors decided to transform the two open-ended questions creating a more repeatable set of answers. The four possible answers added to these two questions allow a precise localization of the deformities and their improvements. The last question ''whose nose would you most desire to have'' was excluded because it seemed irrelevant for patients with facial deformities and potential psychosocial impairment to compare themselves to famous people. Moreover, the answer would be non-reproducible. A rating scale concerning scar evaluation was added to enhance precision. The answering option ''both'' to the question ''which view of the nose do you prefer'' was added because several patients couldn't decide between ''face'' and ''side''.

Patient satisfaction after secondary rhinoplasty is very high in this study, considering all patients are ready to undergo the same procedure to obtain the same result and a global improvement is estimated at 8,2/10 by the patients, whatever the surgical technique is used, and with a low Standard Deviation. Those results are in accordance with previous studies concerning the same topic [2,11,12]. Despite the common surgeon's frustration in obtaining the perfect result in all views of the nose, patient satisfaction is high [4,13]. These satisfaction scale data are even comparable with the patient satisfaction in the general rhinoplasty population [3,11]. Furthermore, the achieved facial amelioration may support the psychosocial rehabilitation of cleft patients, by improving self-esteem and generic quality of life [14].

However, the mean aesthetic improvement is higher than the functional one. No patient complained about worsened functional results but half of them described an unchanged situation concerning nasal breathing after secondary rhinoplasty. Nasal airway patency still seems to be a challenge in cleft patients for surgeons, and this difficulty has also been reported by Hens [11]. Those results highlight the necessity of objective methods like rhinomanometry to assess nasal respiratory function before surgery as a planning tool, but also after surgery as a means of quality control.

Herein, patient assessment is subjective but patient satisfaction is the most important criterion for evaluating the surgery success. It is known that ''objective'' measuring of aesthetic or functional outcome is not a good predictor of patient satisfaction. Satisfaction is not only dependent on

PROSPECTIVE, OBJECTIVE AND SUBJECTIVE, PRE AND POSTOPERATIVE SCALE FOR SURGEONS, NOVICES AND PATIENT		
Question	Before surgery	After surgery
Which part(s) of nose you dislike the most ? 1: tip, 2: nares; 3: dorsum, 4: columella		
Which part(s) of nose you prefer the most ? 1: tip, 2: nares; 3: dorsum, 4: columella		
Which view(s) of the nose do you prefer ? 1: face, 2: side, 3: bottom view		
Which view(s) of the nose do you dislike ? 1: face, 2: side, 3: bottom view		
Rate the nasolabial scar of 0 to 10		
Rate the aesthetic aspect of the nose of 0 to 10		
Rate the nares symmetry of 0 to 10		
Rate the nose symmetry of 0 to 10		
Knowing the final results, would you undergo the surgery again ?		
Rate the nasal breathing of 0 to 10 (only for patients)		

Figure 3 Prospective, objective and subjective, pre and postoperative scale for surgeons, novices and patient.

the surgeon's skills, but also on a variety of factors such as humaneness, amount of information given by the professional, cost of the procedure and attention to the psychosocial problems of the patient [11].

Our study may be biased by two factors. Nine patients (31%) remain unreachable and two different surgeons operated on the patients, which may skew our results. The number of patients recruited remains insufficient to extrapolate our results but the goal was to study specifically the population with UCLP to avoid the difference of form and severity of nose deformities between the different types of cleft. However, all the patients benefited from primary surgical protocol by a single one operator, according to an identical scheme and none of them had benefited from primary or intermediate rhinoplasty, allowing to consider the population as relatively homogeneous.

A prospective study would be more valuable and the perfect scale to assess secondary rhinoplasty would be a specific and precise assessment allowing pre and postoperative rating by professionals, novices and patients. A project of this new scale in accordance with these requirements is presented in Fig. 3. Its use in a prospective way will allow us to compare the pre and postoperative result, based on clinical exam or photographic analysis, from patients, novices and surgeons points of views, which is not yet described in the literature to date.

Conclusions

Despite the difficulty in obtaining aesthetically pleasing and symmetrical results in UCLP secondary rhinoplasty, patient satisfaction is very high. Although nasal obstruction is an important motivation to undergo the procedure, its correction remains difficult to obtain. The custom-designed specific scale presented in this study gives a precise and reproducible evaluation, available for the patient. A prospective study like the one of Sawyer or Van Zijl [3,9] is needed to validate a universal advanced scale version allowing direct comparison between pre and postoperative assessment of surgeons, novices and patients evaluation.

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Disclosure of interest

The authors declare that they have no competing interest.

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