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Outcomes of septorhinoplasty: a new approach comparing functional and aesthetic results

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Abstract. The aim of this study was to compare objective and subjective functional results of septorhinoplasty with subjective aesthetic results. A prospective study was performed including global and subgroup analyses (primary versus secondary septorhinoplasty). Three instruments were used to evaluate pre- and postoperative results: rhinomanometry for the objective functional analysis, the Nasal Symptom Obstruction Evaluation (NOSE) scale for the subjective functional analysis, and the Rhinoplasty Outcome Evaluation (ROE) scale for the subjective aesthetic analysis. A septorhinoplasty was performed in all cases. Thirty-five patients were included (22 female), of whom 74% underwent primary septorhinoplasty. The correlation between rhinomanometry, NOSE and ROE scores was analysed. Mean resistance of the two nasal cavities was 4.9 (standard deviation (SD) 8.35) sPa/ml before surgery and 0.8 (SD 0.7) sPa/ml after surgery. NOSE and ROE scores were, respectively, 72.5/100 (SD 21.7) and 7.5/24 (SD 11.3) before surgery and 22/100 (SD 20.6) and 18/24 (SD 17.3) after surgery. Patients complaining of postoperative nasal obstruction had a worse aesthetic evaluation. Correction of the functional disease appears to be as important as aesthetic correction. This study comparing functional and aesthetic results after septorhinoplasty could provide a basis for future studies.

Key words: NOSE questionnaire; rhinomanometry; quality of life; ROE questionnaire; rhinoseptoplasty.

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The ventilatory function of the nose must be considered when performing nasal surgery[1,2]. The aesthetic and functional rhinoplasty (septorhinoplasty) aims to harmonize nasofacial morphology while restoring normal ventilation. There are many subjective rating scales for the assessment of the ventilatory function of the nose, including the Nasal Obstruction Symptom Evaluation (NOSE) instrument (Table 1)[3,4]. In terms of objective functional analysis, rhinomanometry, which measures airflow resistance in the nasal cavities, is the only method used routinely in the clinical setting. Subjective aesthetic results can be assessed using the Rhinoplasty Outcome Evaluation (ROE) instrument (Table 2)[5].

Many studies have compared objective and subjective functional results following the use of various surgical techniques. Although a subjective measure, patient satisfaction with aesthetic results is the key indicator of surgical success[6–11]. No study appears to have compared functional and aesthetic results after septorhinoplasty. The aim of this study was to com-

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Table 1. Nasal Obstruction Symptom Evaluation (NOSE) instrument.

Over the past one month, how much of a problem were the following conditions for you? Please circle the most correct response					
	Not a problem	Very mild problem	Moderate problem	Fairly bad problem	Severe problem
Nasal congestion or stuffiness	0	1	2	3	4
Nasal blockage or obstruction	0	1	2	3	4
Trouble breathing through my nose	0	1	2	3	4
Trouble sleeping	0	1	2	3	4
Unable to get enough air through my nose during exercise or exertion	0	1	2	3	4

pare the objective functional results (rhinomanometry) and the subjective functional results (NOSE) after septorhinoplasty with the subjective aesthetic results (ROE).

Patients and methods

All patients gave written consent before participating in the study. This study was performed in accordance with the Declaration of Helsinki. An exemption was given by the institutional ethics committee (Ethics Committee of Assistance Publique Hôpitaux de Marseille).

Sample

This single-centre prospective study was performed in the ENT department of a university hospital. All patients undergoing primary or secondary septorhinoplasty, operated on by two surgeons between January 2013 and January 2015, were eligible. Three tools were used to evaluate pre- and postoperative results: rhinomanometry for the objective functional analysis, NOSE (Table 1) for the subjective functional analysis, and ROE (Table 2) for the subjective aesthetic analysis. A septorhinoplasty was performed in patients with preoperative non-reversible nasal obstruction after a vasoconstriction test (rhinomanometry). Various surgical procedures were performed depending on the origin of the nasal obstruction, including cartilaginous resections, grafts (spreader, autospreader, or alar batten grafts), or sutures involving the nasal valve.

Inclusion criteria for the study were age over 18 years, presence of a symptomatic septal deviation (responsible for architectural nasal obstruction, as revealed by questionnaire and rhinomanometry) associated or not with a dysfunctional nasal obstruction (e.g. turbinate hypertrophy), and patient's signed consent to participate in the study.

Exclusion criteria were age under 18 years, another cause of nasal obstruction (choanal atresia, adenoids, tumours, etc.), and a nasal fracture in the past 6 months. All patients wished to obtain functional and cosmetic improvements. Rhinoplasty and septoplasty were performed in all patients.

Objective functional analysis by rhinomanometry

Rhinomanometry (before and after vasoconstriction test) was performed before surgery and at 12 months after surgery. The same rhinomanometer was used for all patients (Otopront Rhino-sys; Happersberger Otopront GmbH, Hohenstein/Breithardt, Germany). The threshold value used to assess the presence of nasal obstruction was 0.30 sPa/ml, as defined by the manufacturer. Resistance between 0.30 and 0.49 sPa/ml indicates mild obstruction, resistance between 0.50 and 0.80 sPa/ml indicates moderate obstruction, and resistance >0.80 sPa/ml indicates severe obstruction. In order to limit the influence of the nasal cycle on rhinomanometry data, the resistance values used were the mean aggregated resistance of the right and left nasal cavities (without vasoconstriction).

Subjective functional analysis using the NOSE scale

The NOSE instrument is a graduated 20-point scale; the result is multiplied by 5 to give a final total out of 100[4]. A score of 100 indicates complete nasal obstruction. A NOSE score under 25 is considered normal, a score between 25 and 50 denotes low nasal obstruction, and a score above 50 denotes severe nasal obstruction[12]. The NOSE questionnaire was completed by the patient during the preoperative consultation and again at 12 months after surgery, on the same day that rhinomanometry was performed.

Subjective aesthetic analysis using the ROE scale

The ROE scale provides a comprehensive assessment of patient satisfaction before and after septorhinoplasty. The ROE scale is scored from 1 to 24 points. A score of $\geq$12 out of 24 is considered 'normal' and a score of $<$12 out of 24 reflects patient dissatisfaction regarding the aesthetics of his/her nose[5]. Patients were judged to be satisfied after surgery if the ROE score

Table 2. Rhinoplasty Outcome Evaluation (ROE) instrument.

Please circle the most correct response					
Do you like how your nose looks?	Absolutely no (0)	A little (1)	Moderately (2)	Very much (3)	Absolutely yes (4)
Do you breathe well through your nose?	Absolutely no (0)	A little (1)	Moderately (2)	Very much (3)	Absolutely yes (4)
Do you believe your friends and the people who are dear to you like your nose?	Absolutely no (0)	A little (1)	Moderately (2)	Very much (3)	Absolutely yes (4)
Do you think the current appearance of your nose hampers your social or professional activities?	Always (0)	Frequently (1)	Sometimes (2)	Rarely (3)	Never (4)
Do you think your nasal appearance is as good as it could be?	Absolutely no (0)	A little (1)	Moderately (2)	Very much (3)	Absolutely yes (4)
Would you undergo surgery to change the appearance of your nose or to improve your breathing?	Definitely (0)	Very likely (1)	Possibly (2)	Probably not (3)	No (4)

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