

## Outcome of septorhinoplasty: a comparison of patient and surgeon views

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**Key-words.** Rhinoplasty; outcome assessment; questionnaires

**Abstract.** *Outcome of septorhinoplasty: a comparison of patient and surgeon views. Objective:* The aim of septorhinoplasty and the outcome were evaluated by the patient and the surgeon. The assessment focused on six well-defined characteristics of the nose: profile, width of the osteocartilaginous dorsum, symmetry, nasal tip, nostrils and nasal patency. Patient and surgeon assessments were compared.

*Materials and Methods:* Both patient and surgeon opinions were obtained using a self-designed questionnaire covering the aim of the surgery, the most important positive and negative post-operative results, a general rating of the post-operative result and a rating of the pre-operative information given by the surgeon. We compared patient and surgeon views about the late (between 6 and 18 months) post-operative result of septorhinoplasty using Kappa statistics.

*Results:* Sixty-nine patients were studied; 44 responded. The match between patient and surgeon views was closest in respect of the pre-operative aims and negative post-operative results. Patient and surgeon opinions differed most in terms of why a result was positive: nasal width was a more important issue for patients, and nasal symmetry was more important to the surgeon. Nasal patency and profile were equally important to both. The general rating on a visual analogue scale was a mean of 7.05 out of 10. The quality of the pre-operative information was found to be good by most patients.

*Conclusions:* Using a self-designed questionnaire for septorhinoplasty, we mainly found significant differences between patient and surgeon opinions in the post-operative evaluation of why results of the surgery are positively appreciated.

### Introduction

There are many different aspects to consider in the outcome of septorhinoplasty (SRP). Some studies discuss the influence on outcome of certain technical aspects of SRP (e.g. open or closed approach, correction of the nasal valve, the use of spreader grafts), and use iconography, rhinomanometry and different types of morphometry as dependent variables.

Obviously, the patient's opinion is the most important dependent variable in the outcome of SRP. It is clear that the result of SRP cannot be assessed only by describing and measuring technical issues, and so quality-

of-life studies using standardised validated questionnaires are becoming more popular.<sup>1-3</sup> In aesthetic surgery, body-image and quality-of-life measures are used to determine aesthetic surgery outcomes.<sup>4,6</sup>

The surgeon who performs SRP has to look at the individual patient's nose deformation from a technical and anatomical perspective in order to assess what needs to be corrected and how this should be done. However, he will also consider aesthetic issues, patient psychology and expectations, and be aware that compromises will be necessary in many cases. In each SRP case, both the surgeon and the patient will each have a certain idea of what consti-

tutes the best possible result. Ideally, the surgeon's idea will match that of the patient. There is, however, very little literature covering the question of concordance between patient and surgeon expectations.

The aim of this study was to compare patient and surgeon opinions about pre-operative aims and the late results of SRP (between 6 and 18 months after surgery). Both the physical appearance and the function of the nose were evaluated. Our goal was to determine whether surgeons and patients find the same issues important, and to define which aspects of outcome determine a positive or negative evaluation by the patient or the surgeon.

## Materials and methods

To obtain patients' opinions about the late result of SRP, we sent questionnaires by mail to 69 patients. All these patients underwent SRP for a combination of functional and aesthetic reasons. The procedures were performed by the same surgeon in 2003 or 2004. By sending these questionnaires by mail in an anonymised way, well after the surgery was performed, we hoped to exclude certain personal effects, and to give subjects the opportunity to state their opinions honestly.

The questionnaire we sent (Figure 1) comprised five questions: (1) the aim of the surgery: a summary of the most important complaints before surgery; (2) the most important positive post-operative results; (3) the most important negative post-operative results; (4) a general rating of the post-operative result using a Visual Analogue Scale (VAS); and (5) a four-point rating of the quality of the pre-operative information that was given (1 = very bad, 2 = insufficient, 3 = good, 4 = perfect).

To answer each of the first three questions, patients had to consider a schematic drawing of six characteristics of the nose (profile, width of the osteocartilaginous dorsum, symmetry, nasal tip, nostrils and nasal patency). They were required to select at least one characteristic and no more than three. These characteristics were then ranked from most important to least important.

The surgeon recorded his opinion in each patient's medical file – using the same system used in the first three questions of the questionnaire – at the time of the immediate pre-operative consulta-

tion and of the consultation 6-months post-operative.

### Statistical analysis

Kappa analysis was conducted to compare patient and surgeon views.

Kappa analysis is a test that quantifies the level of agreement between different raters.<sup>7-9</sup> The null hypothesis is rejected when there is more agreement than might occur by chance. In that case the Kappa coefficient will be greater than 0.4. This method of testing is very appropriate when nominal ratings are used.

## Results

We received 44 replies from patients (28 males and 16 females). The mean age was 34 years, with the youngest patient being 13 and the oldest 64 years old. Half of the patients were in the 21-40 age group. Of these 44 patients, 26 subjects underwent open-approach SRP. The age and gender distribution was comparable in both approaches.

The non-responders group consisted of 17 males and 8 females, with a mean age of 29 years. As in the first group, half of the patients were in the 21-40 age group. Of these 25 patients, 15 underwent an open-approach SRP.

### General rating

A general rating of the post-operative result was obtained using a VAS. The mean VAS score was 7.05 on a scale of 0 and 10. The VAS score was not significantly influenced by gender (two-sided t-test,  $p = 0.70$ ), age (two-sided t-test,  $p = 0.30$ ) or the type of approach (open or closed) (two-sided t-test,  $p = 0.30$ ). The distri-

bution of the VAS scores is shown in Figure 2. Interestingly, two patients scored 0, and two other patients scored 10. All of these four patients were male.

### Information rating

When asked for the amount and quality of the information given by the surgeon about the SRP, most patients found this to be good. This corresponds to a mean score of 3 on a scale of 1 to 4. The distribution of these results is shown in Figure 3.

### Pre-operative situation

In each SRP case, patient and surgeon had to give a top three of items considered to be most important pre-operatively. However, they had the option of scoring only one or two items where applicable.

Figures 4a and 4b show the pre-operative evaluation of the nose by the surgeon (Figure 4a) and the patient (Figure 4b). The figures show how many times each item was chosen as a first, second and third aim. Nasal patency is the most frequent aim for surgery. It is cited 30 times by the surgeon (21 times as a first, 5 times as a second and 4 times as a third choice), and 35 times by the patient (26 times as a first, 4 times as a second and 5 times as a third choice).

Nasal patency is followed by nose profile, which is cited 23 times by the surgeon (13 times as a first, 6 times as a second and 4 times as a third choice) and 23 times by the patient (11 times as a first, 8 times as a second and 4 times as a third choice).

Deformation of the nostrils was not the leading issue for either

Figure 1

Questionnaire used for the evaluation of SRP by the patient and (questions 1-3) surgeon. English translation of the original Dutch version.

**Survey of the results of nasal corrective surgery, as evaluated by the patients themselves**

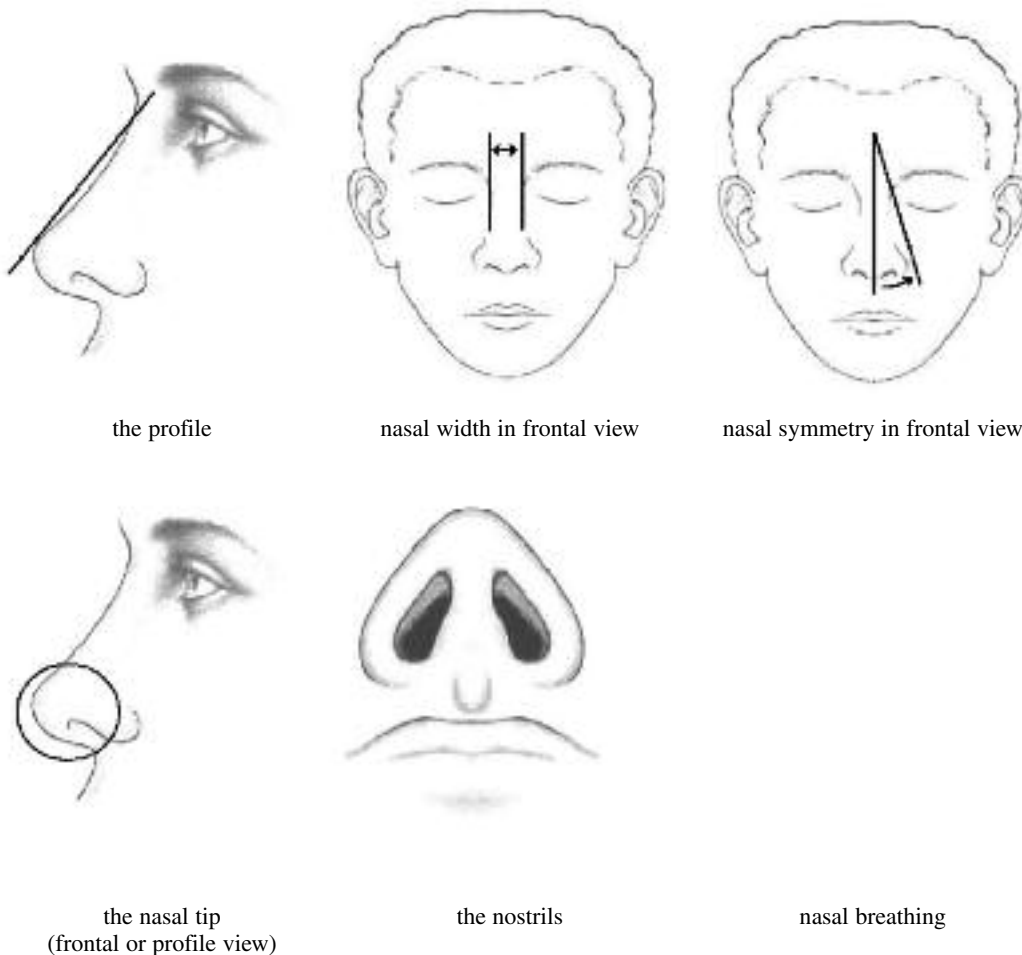
You had nasal surgery some time ago.

We would like to ask for your cooperation in a scientific evaluation. Please complete the following questionnaire and send it back in the accompanying envelope.

We mean to evaluate the final result of this kind of operation in very specific ways so that we can provide better information for people who will have similar surgery in the future and devote more attention to those aspects of these operations that may have been under-emphasised in the past.

Your answers will of course be processed in a discrete and anonymised way. We want your answers to be frank and honest, without any possible impact on any future contacts with your physician. This document is therefore coded and your identity will remain unknown to the researchers at all times.

If you wish to cooperate, you will have to answer all of the five questions below. Forms that are only partially completed are of no use to us. The following figures illustrate what we mean by certain terms used in the questions that follow.



**Question 1** Which shortcoming of your nose was most important to you before your operation?

You can tick one, two or three aspects: 1 the most important aspect; 2 the second most important aspect; 3 the third most important aspect; leave all others unmarked.

The profile	1	2	3
Nasal width in frontal view	1	2	3
Nasal symmetry in frontal view	1	2	3
The nasal tip	1	2	3
The nostrils	1	2	3
Nasal breathing	1	2	3

**Question 2** Which aspect of your nose was changed for the better by your nasal surgery?

You can tick one, two or three aspects: 1 the most important improvement; 2 the second most important improvement; 3 the third most important improvement; leave all others unmarked. (As an example: if you feel that only nasal breathing has improved: only tick the 1 behind "nasal breathing"; if you feel that all aspects of your nose have improved: only tick three improvements, number 1 being the most important to you)

The profile	1	2	3
Nasal width in frontal view	1	2	3
Nasal symmetry in frontal view	1	2	3
The nasal tip	1	2	3
The nostrils	1	2	3
Nasal breathing	1	2	3

**Question 3** Which aspect of your nose has not changed for better (or even got worse) since your nasal surgery?

You can tick one, two or three aspects: 1 the worst aspect; 2 the second worst aspect; 3 the third worst aspect; leave all others unmarked.

The profile	1	2	3
Nasal width in frontal view	1	2	3
Nasal symmetry in frontal view	1	2	3
The nasal tip	1	2	3
The nostrils	1	2	3
Nasal breathing	1	2	3

**Question 4** Give your general rating of the result of your nasal operation. You do this by placing one small cross on the line. If you think the result is perfect, place your mark at the far right of the line; if you think the result is very bad, you should place the cross at the far left.

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very bad

perfect

**Question 5** How would you rate the information that was given to you before your operation in respect of the results that could be expected?

bad

mediocre

good

perfect

**Question 6** If you wish to comment on other aspects concerning your nasal surgery, please write them here. (This answer is optional.)

We thank you for your cooperation.

Professor J. Claes

patients or the surgeon in any case.

### Post-operative results

Figures 5a and 5b show the most important positive and negative post-operative results for SRP as viewed by the surgeon (Figure 5a) and the patient (Figure 5b). Positive results are shown above the horizontal axis; negative results (*i.e.* persisting or new deformations) below it.

Nasal patency is the positive result cited most by both the surgeon (17 times as a first, 6 times as a second and 4 times as a third

choice, a total of 27) and by the patient (25 times as a first, 4 times as a second and 2 times as a third, a total of 31). Nasal patency is again followed by nose profile, which is the second most cited positive result by both the surgeon (14 times as a first, 7 times as a second and 3 times as a third choice, a total of 24) and the patient (13 times as a first, 11 times as a second and once as a third choice, a total of 25).

The most frequent negative results according to the surgeon are nose symmetry, which is cited 15 times (13 times as a first, once as a second and once as a third

choice) and the nostrils, which is also cited 15 times (7 times as a first and 8 times as a second choice).

According to the patient, the most frequent negative post-operative results are nose width, which is cited 16 times (11 times as a first, 4 times as a second and once as a third choice) and nose symmetry, which is cited 11 times (10 times as a first and once as a third choice).

### Comparison of patient and surgeon views

The overall results, as shown in Figures 4 and 5, show that nose

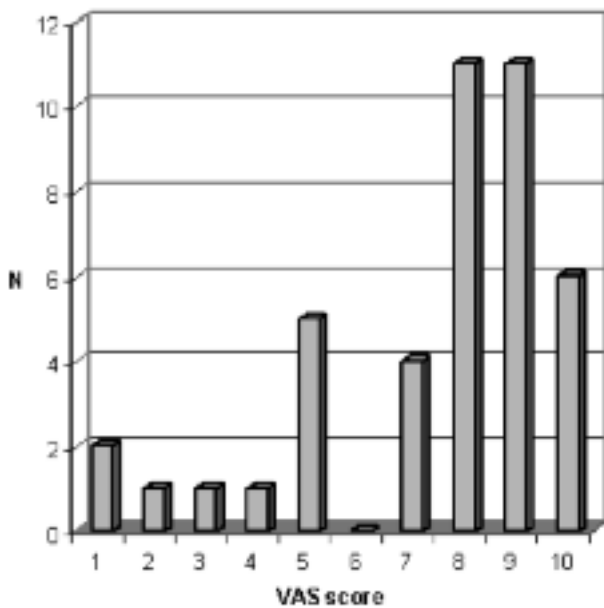


Figure 2

General rating of SRP result by the patient using VAS scores. 0 represents the worst conceivable result and 10 a perfect result.

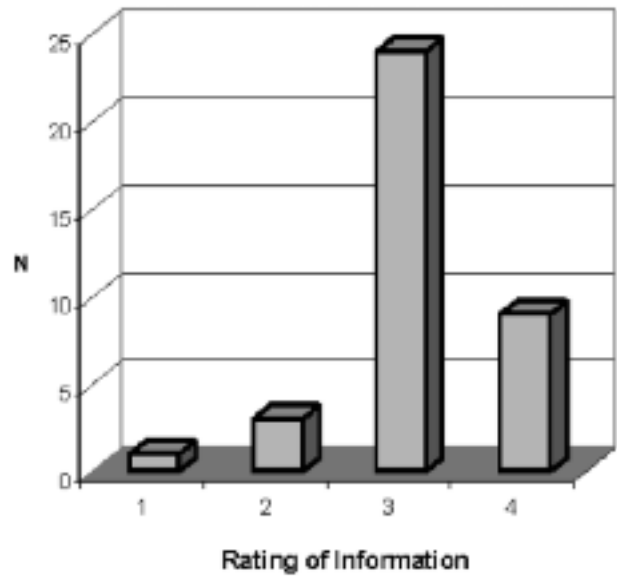


Figure 3

Rating of the information given by the surgeon (1 = poor, 2 = moderate, 3 = good, 4 = very good).

profile and nasal patency are the most important pre-operative aims for both the surgeon and the patient. In the post-operative setting these issues seem more important to the patient. Symmetry seems to be more important for the surgeon, as it is often cited as a negative post-operative result. Nasal width seems to be under-corrected, as this is a problem that often persists post-operatively, and this seems to be more important for patients than for the surgeon. Overall, nose symmetry and nasal tip are relatively more important for the surgeon than for patients.

Patient and surgeon views about the nostrils and the width of the nose are highly divergent. Improvement of the nostrils is never the first aim of the surgery.

Another finding is the closer correlation between surgeon and patient opinions about the negative post-operative results com-

pared to the positive post-operative results. It seems logical that the patient and surgeon will agree more about specific persistent deformities and/or new complaints, if any, than they would do if a good overall result was achieved.

The surgeon did not state a third criterion for the pre-operative aims in 7 cases. Five patients did not state a second choice and 22 did not state a third choice. It would seem that the surgeon planned to make more corrections to the nose than the patients require.

It is possible that the patient may concentrate on one issue and that the surgeon may have a more differentiated opinion, evaluating the nose as a whole. This difference is no longer apparent in the post-operative situation, with the surgeon not stating second and third choices in 100 cases, as compared to 115 for the patients.

A Kappa coefficient was calculated for each nose feature, representing the correlation between patient and surgeon opinions. This was done for the aim of the surgery, the positive post-operative results and the negative post-operative results. The results are shown in Table 1. A Kappa coefficient greater than 0.4 suggests a good correlation. Significant correlations are highlighted.

In the pre-operative situation, there is good correlation for all items except symmetry and nose tip. Looking back to Figures 4a and 4b reveals that these issues are more important for the surgeon than for the patient. When we look at why the patients and the surgeon are pleased with results of surgery, we find an apparent disagreement in all areas. Understandably, they agree more about the negative post-operative results.

Table 2 shows, for those issues where no significant correlation

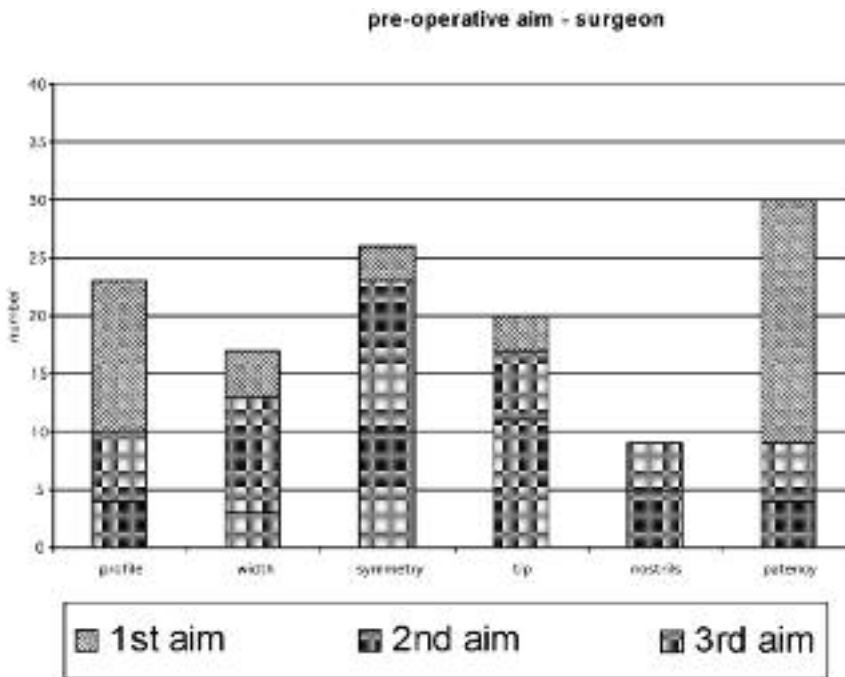


Figure 4a

Pre-operative evaluation of the nose by the surgeon. The vertical axis indicates how many times an item (on the horizontal axis) was chosen as a first, second and third aim.

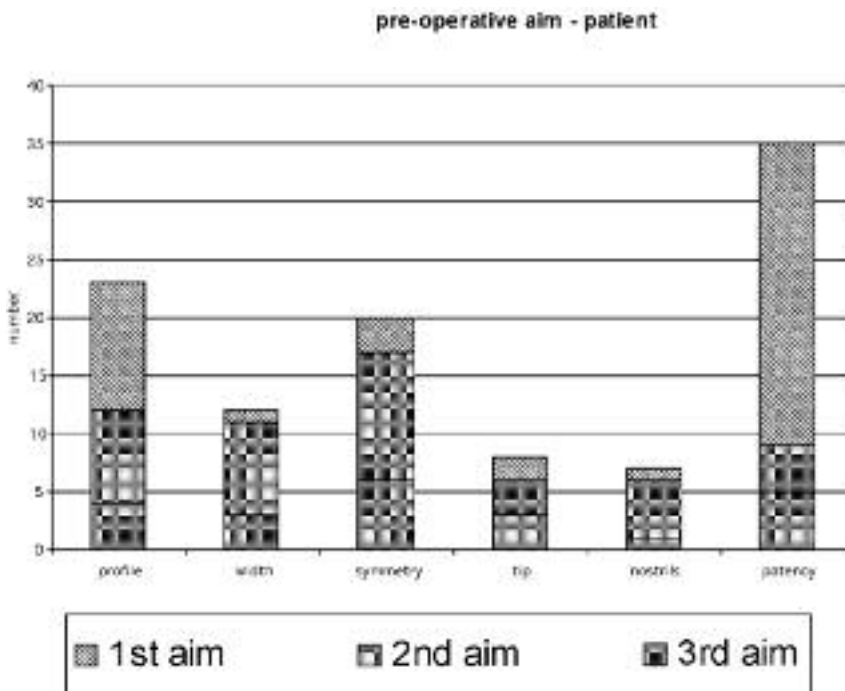


Figure 4b

Pre-operative evaluation of the nose by the patient. The vertical axis indicates how many times an item (on the horizontal axis) was chosen as a first, second and third aim.

was found, whether the surgeon or patient judgement predominates. Here we can clearly see that, for the surgeon, symmetry and the nasal tip are more important, while nasal profile and nasal patency predominate for patients.

**Discussion**

Evaluation of outcome has become a necessity in rhinoplasty and SRP. The Glasgow Benefit Inventory (GBI) and the Nasal Symptom Questionnaire (NSQ)<sup>1,3</sup> have proven their value as outcome measures. Stewart *et al*<sup>2</sup> mention the importance of nasal function in the outcome and benefit of SRP.

Analogous to other facial plastic surgery procedures, rhinoplasty outcome has been quantified by the development of a specific questionnaire, the Rhinoplasty Outcome Evaluation (ROE),<sup>5</sup> which has been validated for reliability and consistency.<sup>6</sup>

All these questionnaires evaluate three quality-of-life domains: physical, mental and social. However, they do not address the specific physical reasons for degrees of patient satisfaction after nasal surgery, nor do they allow for an evaluation by both patient and surgeon in each individual case using the same methodology.

The goal of our study was to find out whether the same characteristics of the nose are important in patient and surgeon assessments. Our investigation covered both the pre-operative and post-operative settings.

To compare patient and surgeon views in a way that allows for the statistical analysis of the results, those views have to be expressed

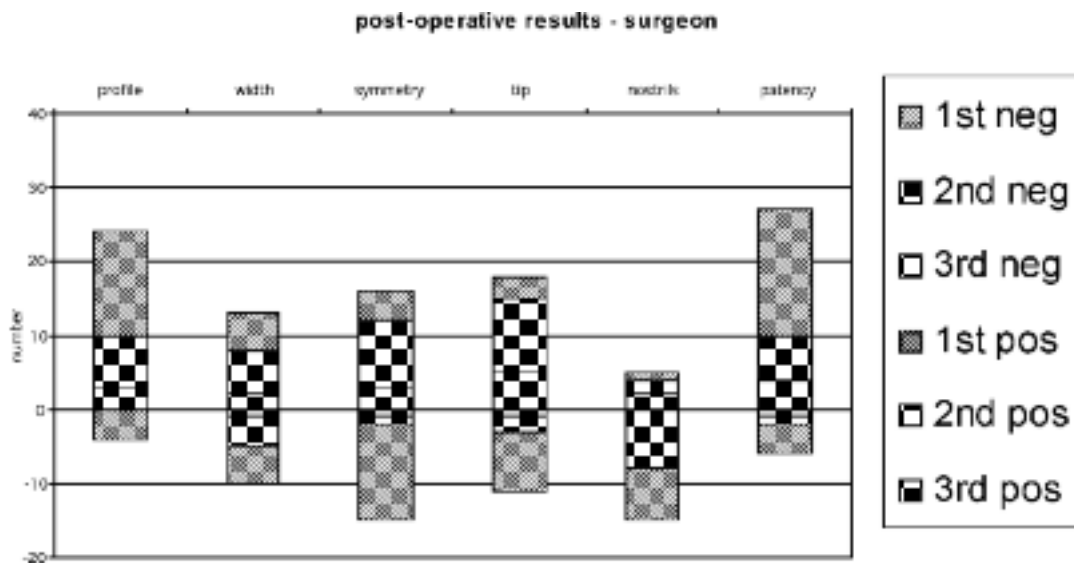


Figure 5a

Positive and negative post-operative results given by the surgeon.

The vertical axis indicates how many times an item was chosen as a positive (above the horizontal axis) and negative result (below the horizontal axis).

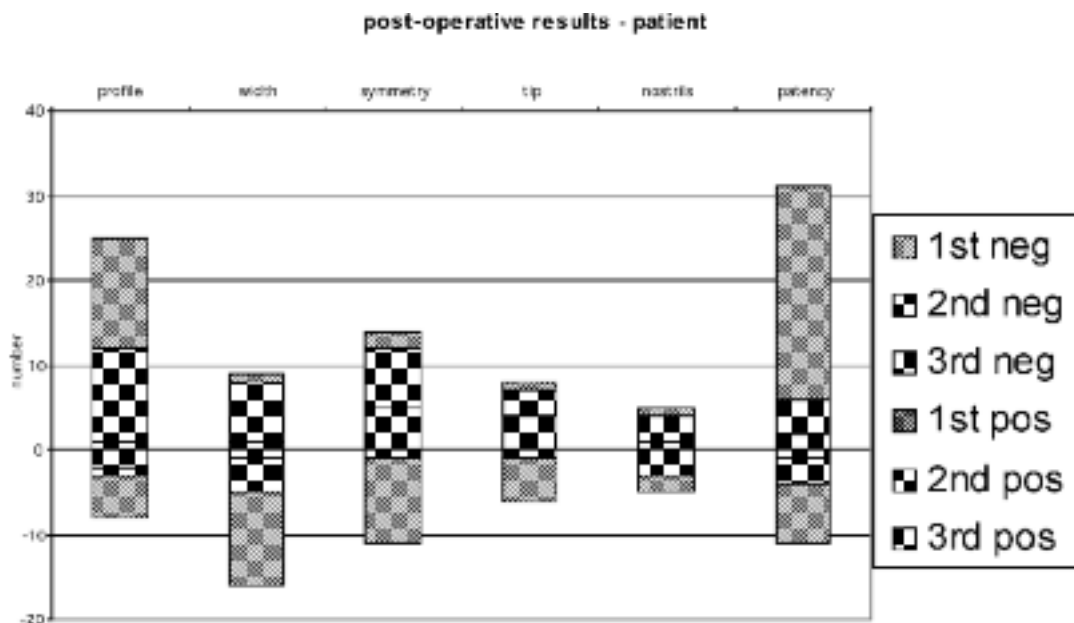


Figure 5b

Positive and negative post-operative results given by the patient.

The vertical axis indicates how many times an item was chosen as a positive (above the horizontal axis) and negative result (below the horizontal axis).

in the same systematic way. As yet, there is no questionnaire in the English literature that meets this criterion. We therefore decided to design the questionnaire used in

this study. We hypothesise that the questionnaire is a good compromise for both parties. However, at present, it has not yet been validated.

A possible bias of this study is that the post-operative evaluation of the surgeon represents the result of the SRP six months post-operatively. The patient survey, on

*Table 1*  
Comparison of patient and surgeon views using Kappa analysis

	Aim	Positive results	Negative results
Nose profile	<b>0.45</b>	0.29	<b>0.54</b>
Nose width	<b>0.55</b>	0.23	<b>0.47</b>
Nose symmetry	0.39	0.26	<b>0.53</b>
Nose tip	0.22	0.24	0.07
Nostrils	<b>0.43</b>	0.20	0.24
Nasal patency	<b>0.46</b>	0.39	0.30

The Kappa coefficient is given for each nose feature, comparing patient and surgeon views about for the pre-operative aim, the positive post-operative results and the negative post-operative results.

A Kappa coefficient >0.4 represents a moderate correlation, >0.6 represents a good correlation, >0.8 represents an excellent correlation.

*Table 2*  
Comparison of patient and surgeon views: Kappa analysis interpretation

	Aim	Positive result	Negative result
Nose profile		Patient	
Nose width		Surgeon	
Nose symmetry	Surgeon	Surgeon	
Nose tip	Surgeon	Surgeon	Surgeon
Nostrils		Surgeon	Patient
Nasal patency		Patient	Patient

Table 2 shows, for those aspects where no significant correlation was found, whether surgeon or patient judgement predominates.

the other hand, evaluates the outcome after 6-18 months.

The fact that we compare the evaluations of 44 patients and only one surgeon is obviously not ideal. In future studies we hope to be able to include SRP cases from different surgeons.

Since our aim was to compare patient and surgeon opinions about the outcome of the SRP procedure, we decided to exclude from this study any objective measures of nasal function and not to include objective assessments of the aesthetic properties of the noses treated. Our decision to perform SRP with a functional aim is mainly based on clinical grounds. It is, incidentally, not proven that the inclusion of rhinomanometry in the pre-operative assessment for septoplasty improves long-

term satisfaction among patients.<sup>10</sup> It has also been shown that objective assessments of nasal tip projection and nasolabial angle correlate well with surgeons' subjective assessments of rhinoplasty outcome, but no correlation with patient assessments of rhinoplasty outcome has been proven.<sup>11</sup>

Studies comparing patient and surgeon satisfaction after rhinoplasty have rarely been conducted. We found one paper in the English literature that emphasises detailed physical features of the nose after less-than-satisfactory rhinoplasty and compares patient and surgeon satisfaction.<sup>12</sup> The authors concluded that, in general, there are major differences between how and why patients consider a result unsatisfactory and why surgeons do. In general, it has been found that surgeons are more critical

than their patients, and that patient satisfaction is not well predicted by surgeons' opinions.

In our results, nasal patency and correction of the nose profile clearly predominate in all evaluations. This is not surprising since our SRP patients had a combined functional and aesthetic aim and since the nasal profile is a more striking feature in general. Improvement of the nostrils was never the first aim of the surgery. This does not necessarily mean that the nostrils are not important. A problem with the nostrils often presents together with a global asymmetry of the nose. This asymmetry can cause a deformity of the tip or compromise nasal patency. In this case, the latter issues are the main reasons for performing the surgery.

The general rating of the outcome of SRP was measured using VAS scores.

The mean VAS score was 7.05, which is comparable to the results of Graber *et al.*,<sup>13</sup> who found that 75% of patients are satisfied after SRP.

The distribution of the VAS scores is clearly bimodal. There are two groups of patients: the satisfied group scored between 7 and 10, while the dissatisfied group assigned VAS scores of less than 5. We registered 2 maximum scores and 2 minimum scores, all from male subjects. However, we were unable to find a statistically significant effect of gender, age or the type of approach on the VAS score. Interestingly, Guyuron and Bokhari<sup>14</sup> found a higher percentage of dissatisfaction following rhinoplasty among male patients (12.8%) than among female patients (4.6%). In a population of ENT patients desiring both aesthetic and functional results, satis-



faction may be more difficult to achieve than in isolated rhinoplasty. McKiernan *et al.*<sup>15</sup> found that the benefit of SRP is greatest when the aim is cosmetic.

We asked all the subjects to state their opinion about the amount and quality of information given pre-operatively. The results are good, but not optimal. A reason for this may be that the majority of the patients expect the surgeon to make a more detailed prediction about the result of the SRP. The surgeon, on the contrary, will be very reticent to make such predictions and will concentrate more on explaining the practical and technical issues of the procedure to the patient.

Several authors have studied the impact of SRP on the psychological status of patients. Surgical corrections of the nose (rhinoplasty and septorhinoplasty) can raise self-esteem and self-confidence and reduce anxiety in individual patients.<sup>16-18</sup> The amount and quality of the information given to the patient pre-operatively is of great importance in establishing realistic expectations, and in order to prevent dissatisfaction and post-operative claims.<sup>19</sup> Gorney<sup>20</sup> found that well over half of the claims in aesthetic surgery are preventable, as most are based on failures of communication and taking too little time to inform the patient.

## Conclusions

In a comparative study with a self-designed questionnaire, we studied patient and surgeon opinions about six well-defined issues. The patients and the surgeon appeared to agree most about pre-operative aims and about the negative post-

operative results. They agreed less about why results can be considered positive. Nasal patency and nasal profile were equally important issues for patients and the surgeon. Nasal width was more important for patients, while nose symmetry appeared to be more important for the surgeon.

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