

# Psychosocial consequences of nasal aesthetic and functional surgery: a controlled prospective study in an ENT setting\*

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## SUMMARY

*Much still needs to be known about what motivates and goes through patients' minds when undergoing nasal aesthetic surgery. Little is also known on how the aesthetic change affects the way other people see those patients after surgery, and if the improved appearance significantly benefits the patients' psychosocial functioning. So far, research has largely focused on subjects in Plastic Surgery settings, neglecting to investigate the specificities of rhinoplasty as performed by otolaryngologists. In order to elucidate these, a prospective controlled-study design was developed. Twenty-five consecutive patients, selected from an ENT practice for septorhinoplasty, were enrolled. They were submitted to pre-operative psychiatric interviews and psychological tests. Two control groups were simultaneously enlisted, and were submitted also to the same tests. Four to seven months after surgery, the septorhinoplasty patients were again evaluated by psychiatric interviews and psychological tests as well as asked to fill out a questionnaire addressing subjective satisfaction with the surgical results. They also underwent, at that time, a rhinomanometric examination assessing the objective success of surgery on nasal function. It was concluded that the study population was basically a psychologically well balanced group of patients, and that a successful surgical result could indeed, in some, improve pre-operative psychological "suffering" related to the nasal deformity, and give these patients a new social identity. Ultimately, it was found that the meeting of aesthetic requirements, frequently not put forward by the patient pre-operatively, was the single most important factor required for a final complete satisfaction with the overall surgical results in this population.*

*Key words: septorhinoplasty, psychological aspects, psychosocial aspects, nasal function, aesthetics*

## INTRODUCTION

The external nose is a feature of utmost importance to define overall facial appearance. And since the face is widely regarded as symbolically reflecting the person's inner self to the outside world, any change of the appearance of the nose is expected to have significant consequences on the subject's psychological as well as social functioning. There is, indeed, evidence that – within aesthetic surgery – rhinoplasty is certainly amongst the forms of surgery with the greatest potential to alter peoples' lives (Pruzinsky and Edgerton, 1990), especially since the psychosocial dynamics it can unfold, are capable of changing the way the person sees him- or herself and is perceived by others. Such aspects have been extensively studied. A great deal of information has already been gathered, and a good critical overview has been published (Wengle, 1986).

So far, research has almost exclusively dealt with aesthetic nasal surgery as performed by plastic surgeons on patients who specifically request changes on their noses. The specific aspects of aesthetic nasal surgery as performed by otorhinolaryngologists have, however, eluded investigation. And we do know that ENT surgeons are frequently called upon to operate on patients, who not only complain of nasal obstruction but also present themselves with poor-looking noses (*"an ugly nose is frequently a nose which cannot breathe"*). Functional (septal) surgery alone is frequently known to produce significant changes on the external appearance of the nose. To improve breathing in a twisted nose surgical action frequently requires straightening it or taking other measures which result in improved appearance. Nowadays, many otolaryngologists feel the need, in order to improve on patients' satisfaction, to expand their technical

expertise so they can address functional and aesthetic aspects as well.

The aim of the present study is precisely to shed some light on this specific set-up associated to ENT surgery on patients in which nasal function and nasal aesthetics entwine, which has so far been scantily, if at all, investigated.

#### MATERIAL AND METHODS

Twenty-five patients, above 18 years of age, were enrolled in the study. They were consecutively selected for septorhinoplasty from an ENT outpatient clinic by several experienced surgeons, on the basis of chronic nasal obstruction complaints attributed to anterior septum deviations. Simultaneously, they displayed features of the external nose which the patients themselves considered objectionable.

Such abnormalities could be classified as: excessive (bony and cartilaginous) hump ( $n=13$ ); lateral deviations of the (bony and cartilaginous) pyramid ( $n=10$ ); and tip deformities ( $n=2$ ). Patients with craniofacial or congenital nasal deformities (i.e., "cleft palate nose") were excluded from the study, which dealt exclusively with post-traumatic and development-type nasal deformities in an adult (over 18 years of age) group of subjects. From the 25 patients enrolled, nine were female and 16 were male. The overall mean age was 28.9 years (range: 18-57 years), with a mean age of  $36.0 \pm 12.0$  years within the female group and  $24.9 \pm 7.1$  years within the male group. With the exception of one black male (aged 18 years) the vast majority of the patients were Caucasian.

Surgery proposal made clear that the main concern for the surgeon was solving functional problems, which supposedly were the reason for the initial ENT consultation request. However, seizing the opportunity it was felt, by both patient and surgeon, that additional surgical steps could be undertaken in order to improve the external appearance of the nose as well. Care was taken not to point out abnormalities or suggest unnecessary aesthetic corrections, however evident they may have been to the surgeon, addressing only the deformities put forward by the patient. No extra hospital fees were charged for the aesthetic procedures.

Study purpose was explained as an evaluation of patient's state of mind by a psychiatrist at two separate moments, pre- and post-operatively. It was specifically stressed that study enrolment would not interfere with or influence the surgeon's decisions in any way. Refusal to participate would not put the acceptance for surgery at risk, and the individual results of the psychological evaluation were not to be known beforehand by the surgeon. The surgical techniques employed were deemed irrelevant to the study purposes and will not be discussed here.

#### Pre-operative evaluation

The pre-operative evaluation was done the day before surgery. Conducted in all cases by the same psychiatrist (M.D.), it included: (1) *Psychiatric interview* which specifically addressed: subject's mental state; psychiatric personal and family history; social, family and personal/intimate relationships; preconceptions, fantasies and general ideas about the surgery; and expectations

about the results. DSM-IV criteria (American Psychiatric Association, 1994) were used to classify psychopathology diagnosed during the interview.

(2) *Psychological tests*. Beck's inventory for measuring depression (Beck et al., 1961), and the SCL-90 (Derogatis et al., 1976), a checklist which detects, grades and discriminates psychological symptoms, were employed.

#### Control groups

Two control groups were assigned, all ambulatory patients from the same ENT department. One group (A) consisted of 25 subjects, matched for age and sex with the septorhinoplasty patients, who were being treated as outpatients with diverse otolaryngologic complaints but in whom no impending nasal surgery of any kind was under consideration at the time of the study enrolment. A second group (B) consisted of 18 patients, not age- or sex-matched with the study population, from a waiting list for another type of nasal surgery – functional endoscopic sinus surgery (FESS) – from which no change in appearance of the nose is expected. It included 9 males and 9 females, all Caucasian, with a mean age of  $37.8 \pm 12.1$  years.

The subjects in both control groups were submitted to the same psychologic test battery as the septorhinoplasty patients under investigation.

#### Post-operative evaluation

The study population undergoing septorhinoplasty was post-operatively evaluated by the same psychiatrist, 4-7 months after surgery (mean: 4.6 months). This interval was considered the most likely to bring forward the psychosocial consequences of the surgery at, what was perceived, a critical point of the early post-operative phase when post-operative soft-tissue facial oedema had for the most part subsided, and sufficient time-span had elapsed for the psychosocial adjustments to the aesthetic change produced to eventually emerge. It included:

(1) *Psychiatric interview*. Not only the repercussions of the surgery on the psychopathology diagnosed pre-operatively were evaluated but also the following issues were specifically addressed: degree of personal satisfaction with the surgical result; awareness of social perception of the cosmetic change; repercussions on self-concept, self-confidence and self-esteem; personal behaviour pattern changes; and life-events related directly to the surgery.

(2) *Psychological tests*. Same tests the patients were pre-operatively submitted to.

(3) *Questionnaire grading satisfaction with the surgical results*.

It required the patients to directly express degrees of satisfaction with specific aspects of the outcome of the surgery, from functional results (three options were given: "very good/good", "average" and "mediocre/bad") to aesthetic results (the same three options: "very good/good", "average" and "mediocre/bad"), and finally degree of global satisfaction with the overall functional and aesthetic results ("total satisfaction", "partial satisfaction" and "dissatisfaction").

(4) *Life-events list*. A list discriminating several possible occurrences in the patient's life (Holmes and Rahe, 1967) between time of surgery and the post-operative evaluation.

(5) *Rhinomanometry*. Anterior active rhinomanometry was employed to assess nasal resistance post-operatively. Broms' modified reference values for individual nasal cavity resistances after decongestion (Jessen and Malm, 1988) were used as normative criteria. Results were considered abnormal whenever an increased (above reference values) nasal resistance after decongestion was found, in one or both nasal cavities.

#### *Statistical analysis*

The Chi-square and the Fischer exact test were used in the analysis of variables. For analysis of the psychological test results, the Wilcoxon test, the Kruskal-Wallis variance analysis and the Mann-Wittney U-test were employed as required.

## RESULTS

### *Pre-operative evaluation*

*Psychiatric interview*: Some type of psychiatric disturbance was found to be present in 10 out of 25 patients (40%). Five subjects were given a diagnosis of personality disorder, while a depressive-type adjustment reaction was recognised in six patients. In one of them, a reactive depression co-existed with a personality disorder. No statistical relation was found, however, between the variable (presence or absence of) psychopathology and the patients' sex or, for that matter, any other variable.

*Psychological tests*: No statistically significant differences were found in any items of all psychometric tests used between the study group and the two control groups.

### *Post-operative evaluation*

*Psychiatric interview*: Thirteen out of 25 study patients (52%: 8 females and 5 males) reported post-operatively that they became aware of being more socially desirable than before surgery. Seven of them (4 females and 3 males) further referred that improved appearance had significantly benefited their social inter-relationships. A highly significant statistical association ( $p < 0.008$ ) was found between the variables "improved social outcome" and "female sex". The former was also found to statistically correlate with the final statement of complete satisfaction with the surgical results (contingency coefficient: 0.54, with  $p = 0.05$ ). Simultaneously, a statistically significant association (Fischer exact test) and correlation ( $\phi = 0.45$  with  $p < 0.05$ ) was found with the "very good/good" aesthetic results statement.

Life-events, which the individuals themselves related in some way to the surgery and its results, were reported in the post-operative evaluation by five patients. However, no statistical relation was found between life-events and any variable considered.

The consequences of surgery upon the patients' previously diagnosed psychopathology were specifically investigated. The personality disorders were, as expected, unaltered in any way.

Surgery and its results were, however, found to be able to change reactive psychopathology in some patients. From the six patients pre-operatively diagnosed with depressive-type adjustment reactions, in three females an important improvement of that situation was post-operatively observed. It occurred simultaneously

with reports of improved social desirability, leading to the conclusion that the nasal deformity was somehow related to their depression. Inversely, two other female patients also satisfied with the surgical results and improved social desirability, did not see their depressive disorders significantly altered, thus allowing the conclusion that the nasal deformity was probably unrelated to it. Only in one patient was the pre-operative depression found to be worse after surgery as the consequence of a non-satisfactory surgical result, suggesting also a connection between the nasal deformity and the depressive mood. A statistically significant association was found between the variables "improvement of reactive psychopathology" and "female sex".

*Psychological tests*: Only one parameter showed statistically significant differences between the pre- and the post-operation period ( $p < 0.05$ ): the IMSP item from the SCL-90, which relates to the mean level of intensity of the symptoms the patient reports as being disturbing/distressing, becoming evident as a significant post-operation reduction of those mean levels.

*Questionnaire on patient's satisfaction rating of the surgical results*: When patients were requested to express their feelings towards post-operative functional results (nasal obstruction resolution), 84% admitted "very good/good" results, 16% an "average" degree of satisfaction, and none expressed a "mediocre/bad" functional rating. When specifically addressing aesthetic results, also 84% reported a "very good/good" result and 16% an "average" result, with no cases of "mediocre/bad" aesthetic results. In order to facilitate statistical treatment, and since no patient reported a "mediocre/bad" result, only the two options "very good/good" and "average" were considered, thus allowing a dichotomy of the grading of the patient's expression of functional and aesthetic results. The patients were finally asked to rate the degree of satisfaction with the global (functional plus aesthetic) results: 16% expressed dissatisfaction, 12% partial satisfaction and 72% total satisfaction with the final surgical results.

Total satisfaction showed a high statistical correlation with the report of "very good/good" aesthetic results ( $\phi = 0.70$  with  $p = 0.0005$ ). However, no relation was statistically found to exist either between total satisfaction and functional results, or between aesthetic results and functional results ratings. At the same time, no statistical relation was found between either presence or absence of psychopathology, or even specific psychiatric diagnosis, and total satisfaction. Relation of total satisfaction with other variables was also attempted, albeit unsuccessfully.

*Rhinomanometry*: Nasal resistance assessment concluded that 7 out of 25 study-group patients concluded post-operatively with unsuccessful functional results (increased nasal resistance in at least one nasal cavity). Therefore, the functional success rate, as assessed by rhinomanometry, was 72%. Functional success, however, was not found to relate either with the expressed global total satisfaction or the subjective rating of the functional result itself. In five patients clearly abnormal nasal resistance values, necessarily causing chronic nasal obstruction complaints, were detected. In spite of this, all of them referred being totally satisfied with the overall surgical results, while expres-

sing a "very good/good" rating for the aesthetic results. So far, none of these five patients have requested surgical revision to improve functional results.

#### DISCUSSION

Several aspects investigated in this study have not been previously addressed in the published literature. To our knowledge, the investigation of the psychological and psychosocial aspects involved in ENT-performed aesthetic nasal surgery has not been explored before. Although nasal obstruction was investigated in at least one study by plastic surgeons (Meyer and Jacobsson, 1987), its approach was less than optimal as no objective assessment methodology, such as the one employed in the present study (rhinomanometry), was used.

On the other hand, psychiatric investigation in this specific research area, which dates as far back as the 1930s and 1940s, is largely plagued by outdated terminology and concepts of mental disorder, for the most part presently unacceptable. To the best of our knowledge, no other study has employed DSM-IV criteria with current nomenclature and concepts of psychopathology. Also, pertinent criticism has been put forward to the psychological tests occasionally employed, since most of these instruments have not been validated (Wengle, 1986). That criticism certainly does not apply to the tests selected for this study (the SCL-90 and Beck's Depression Inventory) both enjoying international acceptance and unblemished reputation.

Control group selection in this study can also claim unprecedented status in a research area in which controlled studies are few. Alternatively to non-clinical control groups (Hay, 1970) or clinical populations employing non-cosmetic surgery candidates waiting for operations on body areas other than the nose (Wright and Wright, 1975; Marcus, 1984), it was deliberately decided to select two control groups from the same ENT outpatient clinic from which the study population was also selected. The comparison with the age- and sex-matched first control group intends to outline differences and similarities to a psychologically "normal" group of individuals, representative of the general population; they may require outpatient-clinic ENT care, but no nasal surgery of any kind is being considered for the time being. With the second control group, representative of the candidates to another type of nasal surgery, this time with no aesthetic repercussions, a comparison is intended of the intrinsic characteristics of two surgical groups waiting for surgery on the same organ, the nose, some anticipating its aesthetic change, others not.

From the present study the following conclusions can be drawn: (1) The pre-operative psychiatric interview revealed that most patients were either psychologically "normal" or had only mild to moderate adjustment-type pathology (anxiety, depressive adjustment disorders). Only five cases with personality disorders were found, and there were no psychotic patients in the group. These conclusions agree with what has been increasingly reported in plastic surgery settings for rhinoplasty candidates, found also to be mostly a psychologically "normal" population showing only adjustment-type pathology, possibly as a consequence of their nasal deformity (Wright and Wright, 1975; Burk

et al., 1985; Goin and Rees, 1991). No statistical relation was possible between the variables "diagnosed psychopathology" and "patients' sex". This conclusion is in agreement with recent research which refutes the classical psychoanalytic theory associating higher incidence of more severe psychopathology to the male rhinoplasty candidate population (Jacobson et al., 1960) than to the female counterpart.

(2) No statistically significant differences were found in the psychological test results between the study population and both control groups. This conclusion reinforces the psychiatric interview conclusions that the study population was, for the most part, a psychologically well-balanced group of individuals.

(3) In consequence of the surgical results, more than half of the study population reported that they became aware of being more socially desirable after surgery. A highly significant statistic association was found between this variable and the female sex, allowing the conclusion that women in general are probably more capable than men of becoming aware of the social benefits of a surgically-produced physical improvement. The possibility that women could benefit beforehand of a greater potential for the produced aesthetic change to have a more significant social impact should, however, be kept in mind.

(4) Five patients reported post-operatively life-events that, according to them, were a direct consequence of the surgery itself or its results. No statistical relation was found, however, between that variable and any other, including patients' personality and diagnosis of psychopathology. This conclusion fails to support some authors' theory that specific personality characteristics were behind radical, life-changing events in patients' lives induced by cosmetic surgery (Belfer et al., 1979).

(5) Clinical evidence, in some patients, that the surgery and its results can have a significant effect on reactive psychopathology, namely depressive-type adjustment disorders, either improving after a satisfactory result or making them worse after dissatisfaction. Improvement of reactive depression was found to be statistically associated with the female sex, implying that women pre-operatively with that specific pathology were more likely to psychologically benefit, after a satisfactory surgical result, than men were. Personality disorders were not, as expected, subject to change as a consequence of the surgery.

(6) The post-operative/pre-operative longitudinal comparison of the scores of all the items of the psychological tests revealed significant differences in only one parameter: the SCL-90 IMSP, with a decreased score after surgery, suggesting that the intensity of the symptoms the patients admit as being disturbing to them diminishes. Overall, these results agree with the conclusions of other studies (Wright and Wright, 1975; Marcus, 1984; Burk et al., 1985; Robin et al., 1988; Goin and Rees, 1991), which employed diverse psychological testing methodology to demonstrate some type of beneficial psychological changes occurring after rhinoplasty.

(7) A high percentage of patients admitting total satisfaction with the global final results, with an equally high percentage of reports of "very good/good" aesthetic and functional results. Those values compare favourably to satisfaction ratings published in the literature referring to rhinoplasty patients operated on

by plastic surgeons (Klabunde and Falces, 1964). Statistically, the only parameter found to correlate with total satisfaction was the statement of "very good/good" aesthetic result. Functional satisfaction was definitely not found to relate with total satisfaction. It could, therefore, be concluded that in this population, and in spite of patients' pre-operative emphasis on functional complaints, the meeting of aesthetic goals was the only factor which was shown to be critical for patients' complete satisfaction with the final surgical result. Certainly this conclusion does not disagree with the previous report that the patients' benefit from septorhinoplasty is related to the patients' perception of surgical success (Stewart et al., 1996). But, as we have to admit, the way patients perceive surgical success is an extremely intricate process, the meeting of functional goals being only one of the vectors at stake, and not necessarily the most important, as judging by our results in this population.

(8) Post-operative function assessed by rhinomanometry showed a 72% objective functional success rate. However, no statistical relation was possible between rhinomanometric definition of functional success and patients' rating of either global satisfaction or even subjective assessment of the functional results. In fact, in a few patients, who ended up with unquestionably "pathological" resistance values, there was clear evidence that they would willingly conform to a less than good functional result once the final aesthetic result satisfied their expectations (a "trade-off" phenomenon) (Pruzinsky and Edgerton, 1990). All this serves to further emphasize what was previously concluded: that satisfaction of aesthetic requirements is the single most important factor for patient's satisfaction with the surgical results in this study population.

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