

# Risks and Complications in Aesthetic and Functional Septorhinoplasty

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## Abstract

**Citation:** Kopacheva-Barsova G, Nikolovski N, Netkovski J, Shirgoska B, Avramovski A. Risks and Complications in Aesthetic and Functional Septorhinoplasty. *Maced J Med Sci.* 2013 Sep 15; 6(3):238-243. <http://dx.doi.org/10.3889/MJMS.1857-5773.2013.0283>.

**Key words:** rhinoseptoplasty; complications; postoperative deformities; postoperative psychological risks.

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**Received:** 23-Feb-2013; **Revised:** 26-Mar-2013; **Accepted:** 03-Apr-2013; **Online first:** 10-Apr-2013

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**Competing Interests:** The author have declared that no competing interests exist.

**Background:** Rhinoseptoplasty (RSP) is regarded to be associated with many risks. The expectations of patient and physician are not always corresponding. Besides of postoperative deformities many other risks and complications have to be considered.

**Aim:** The aim of the study was to precede the frequency of complications in rhinoseptoplasty.

**Methods:** Early and late post RSP complications in 120 patients admitted and operated at ENT Clinic, University Hospital, Skopje in the period of 2005-2012 has been observed. In the patients who wanted to fill the psychological questioner their psychological reactions were taken in consideration.

**Results:** RSP for the first time were prepared in 98 (81.3%) patients. In 22 (18.7%) patients revision RSP has been made, because complications after previous RSP has been occurred. Early postoperative complications (in the first 6 weeks) have been observed in 22 (56.4%) patients. Late post-operative complications (after 6 months-1 year) have been observed in 17 (43.5%) patients. 108 patients, candidates for RSP filled "the Patients selection for septorhinoplasty and their psychological abilities -"Self-body image" questioner.

**Conclusion:** An analysis of revision surgeries can provide information on frequency and types of postoperative deformities. Reports in the literature are based on different parameters what makes comparison difficult. This is why evidence is only based on description and comparison. Inadequate operative technique can make complications and bad results.

## Introduction

Rhinoplasty (Greek: Rhinos (nose) +Septum + Plassein (remodelling) is surgical procedure used for correcting structural deformities of the nose. It involves redesigning the nose by means removing excess bone and cartilage or correcting insufficiencies to make the nose harmonious with the total facial structure.

Complication after rhinoseptoplasty (RSP) may be defined as an unexpected occurrence of an adverse medical or surgical condition. It's requiring separate attention during or following an operation. The patient very often blames the surgeon for this result while the surgeon tends to call it a complication.

In fact, both are possible and cannot be definitely distinguished in many situations. Some

"complications" however are in fact a mistake in preoperative analysis or surgical planning, in applying an inadequate technique or in postoperative care [1, 2].

Rhinoplasty is regarded to be associated with many risks and the expectations of patient and physician are not always corresponding. Aim of this study shows that, besides of postoperative deformities many other risks and complications have to be considered, and an earliest analysis is essential for prevention. In our study we focused to present postoperative deformities, their frequency and possible factors. We were not pointed of numerous techniques for revision surgery but with the types of deformities and their prevention.

Most of the risks and complications have been addressed on the role of the nasal septum as an essential part of the deformity. Besides these deformities we are also suggested of the other risks and complications.

Rhinoseptoplasty is considered to be an operation with high risks, primarily because of the limited predictability of the aesthetic result. The reasons are many: a perfect result immediately after surgery may be totally different one year later, reports on long term results of rhinoseptoplasty are rare, different types of tissues are involved and their individual reactions are not always under the control of the surgeon. This is especially true for cartilage, the main supporting structure of the nose. Limited predictability is mainly due to the dynamics of the healing process [3-5].

According to the literature, the complication for nasal surgery rate varies from 4-18.8%. This rate generally falls as surgical experience accumulates.

Complications in rhinoseptoplasty may be divided into 4 basic categories:

1. Intraoperative complications
2. Immediate postoperative (in the recovery ward) complications
3. Early postoperative complications
4. Late postoperative complications

1. Intraoperative complications are occurring during the operative intervention. Most common are:

- Excessive bleeding (0.3-1%) can be caused by genetic or acquired coagulopathy, usually induced by some drugs. Consuming of those medicaments should be stopped at least 2 weeks before surgery.

- Primary fibrinolysis due to an abnormal activation of the fibrinolytic system leading. Consultation with a haematologist is advised when excessive bleeding occurs.

- Collapse of bony pyramid may occur during removal of a bony hump with an osteotomy, particularly when the patient has had previous nasal trauma or if the vomer or ethmoid have been weakened as a result of previous surgery

- Disarticulation of upper lateral cartilage may occur during rasping. Bilateral disarticulation produces an inverted V-deformity, and unilateral disarticulation produces asymmetry in the middle third of the nose. Spreader grafts may improve airway symptoms and aesthetics.

- Osteotomy complications are "Rocker" deformity: when the medial osteotomy creates a cephalic fracture higher in the thicker part of the frontonasal junction. Repositioning the cephalic fracture lower on the nasal bone rectifies this deformity. "Step"deformity: may result if a single lateral osteotomy is perform too far medial to the

nasofacial groove, with a visible ridge on the side of the nose. "Open roof" deformity may occur when the lateral segments fail to align with the septal dorsum following osteotomies, a gap, which may be visually and palpably obvious, results. If neglected, the intranasal mucous membrane adheres to the overlying soft tissue and may create a depression at the site. If alignment failure is unilateral, the nose appears asymmetric.

- Perinasal trauma occurs during osteotomy, particularly in noses that have previously been traumatized; there is a tendency to recreate preexisting fractures.

- Nasolacrimal apparatus injuries persistent with symptoms which may require fistulization of the sac into the nasal cavity.

- Infraorbital nerve injury has been reported too.

- Intracranial complications are rare [6, 7].

2. Immediate postoperative complications occur in in recovery ward. Some of them are:

- Post-extubation aspiration of blood may cause airway obstruction laryngospasm. Treatment with a muscle relaxant and reintubation are needed.

- Anaphylaxis of some antibiotic or other medications, nasal packing or latex has been reported too.

- Visual disturbances can be transitory or permanent. Reasons may be local anesthetic and vasoconstrictor injection. (8, 9, 10)

3. Early complications occur up to 6 weeks after septorhinoplasty. Most common are:

- Extensive oedema and ecchymosis can last 10 days. Ddifficult osteotomies use inadequate instruments, long operating times, excessive nasal packing, postoperative vomiting, or raised blood pressure can be the reasons.

- Hemorrhage is reported and prevalence varies from 2-4%.

- Septal hematoma may need daily aspiration until the return is free of blood or in other case need larger incision to aid drainage and subsequent packing for 48 hours.

- Skin necrosis can be appears by excessive undermining with instruments, or cautery use.

- Contact dermatitis caused by dressing in sensitive individuals.

- Wound infection appears in less than 2%. It can be manifested as localized cellulitis, abscesses, or granuloma. Antibiotics and drainage are necessary.

- Toxic shock syndrome is very rare complication, but it can be caused by supertoxin-1

(TSST1) produced by the *Staphylococcus aureus* [11, 12].

- Cerebrospinal fluid rhinorrhea may be provoked by previous trauma on that place, or presence of congenital osseous defects [13-17].

Special risks and complications in first 6 weeks after surgery can be manifested as:

Feeling of warm and cold air during respiration, the loss of sensitivity caused by surgical scars and hyposmia after rhinoplasty is only temporarily in most cases because of mucosa swelling.

Early psychological complications are transient episodes of anxiety or depression [18-20].

4. Late postoperative complications appears six weeks to one year after septorhinoplasty. The symptoms and consequences can result as:

- Functional disturbances (breathing problems). In these cases, rhinoplasty is indicated to improve function. Revision rhinoplasty can reduce the cross sectional area of the nasal airways. As a result 10% of the patients after primary rhinoplasty complain about residual or new breathing problems [21, 22].

- Scar hypertrophy and keloids appears after external rhinoplasty in the area around vestibule nasi.

- Synechiae formation follows the creation of opposing raw surfaces.

- Septal perforation occurs in 3-24.5% of cases. Various techniques are described, and various success rates are quoted. If all else fails, a septal button is always available.

- Columella retraction can be caused after excessive resection during "open approach".

- "Polly beak" deformity appears in absence of the supratip dip and may present in degrees. The cause usually lies in under correction of the cartilaginous dorsum and the superior septal angle region (hard Polly beak), but it may result from excessive accumulation of soft tissue scarring or loss of tip support (soft Polly beak) [23-26].

- Saddle nose deformity appears when over section of the nasal dorsum has been made, especially in the cartilaginous area [27].

- Tip asymmetry (tip distortions) can be various. Destructive techniques may provoke nasal valve colaps, excessive removal of the lateral cure, causing alarm collapse and airway discordance. Reconstructive techniques with alar battens may be necessary in difficult cases. Nasal tip ptosis appears when the soft tissue of the nose lost its elasticity and over resection of the alar cartilage is present.

- Paranasal callus is caused when very high and and destructive osteomies were prepared or in

cases when postoperative paranasal haematoma has been occurred.

Other and rare late postoperative complications are:

- Oleogranuloma (lipogranuloma, paraffinoma, oil granuloma, sclerosing lipogranulomatosis, and myospherulosis are the same terms) is unabsorbable fatty material used on nasal packing which can provoke an inflammatory reaction [28].

- Graft/implant migration may comprise resorption, displacement, or extrusion and it may be provoked by trauma and infection.

- Gustatory rhinorrhea and lacrimal fistula appears when parasympathetic and sympathetic are cross-sectioned and as a result of misdirected regeneration of nerve.

Proximity of the lacrimal drainage system to the site of the lateral osteotomies, causes damage of the system and consequent lacrimal fistulisation.

Late psychological dysfunctions:

Recognizing obvious medical and surgical complications should present no difficulty; finer aesthetic complications are harder to define and are based on value judgments related to the aesthetic sense of the surgeon and the body-image demands of the patient.

Some individuals may attach little importance to their appearance, while some cosmetic surgery patients may derive a great deal of self-esteem from their appearance. The degree of dissatisfaction the individual has with his or her appearance: Displeasure with appearance ranges from minor dissatisfaction, causing mild concern, to body dysmorphic disorder, causing obsessive preoccupation to the point of interfering with normal function. Approximately 3% of cosmetic surgery patients have body dysmorphic disorder and may need psychiatric appraisal.

The aim of this study was to precede the frequency of complications in rhinoseptoplasty.

## Material and Methods

In this prospective, non-randomized study, 120 patients with nasal septal deviation (deviation septi nasi, DSN), alone or together with other nasal deformities such as: rhinokyphosis, rhinoskoliosis, rhinolordosis, saddle nose, functional tension nose were observed.

We have been observed early and late post RSP complications in 120 patients admitted and operated at ENT Clinic, University Hospital, Skopje in the period of 2005-2012.

From all patients 67 (55.5%) were women and 53 (44.4%) were men. Age was between 15-57 years, average  $31.6 \pm 5.8$ . By nationality, 43 (39.8%) were

Macedonian, 44 (40.75%) were Albanian, rest were Turkish and the other nationalities.

In the patients who wanted to fill the psychological questioner their psychological reactions were taken in consideration. 108 patients, candidates for RSP filled "the Patients selection for septorhinoplasty and their psychological abilities" - Self-body image questioner.

Brief Symptom Inventory (BSI) test - is a standardized psychological testing, which includes following of some psychological symptoms in patients such as: somatization, obsessive-compulsive reactions, interpersonal sensitivity, depression, anxiety, phobic anxiety, paranoid ideas, and those without symptoms have been evidenced.

We followed how RSP make influence in the relation of the patients with his/her family, environment where they work and live before and after surgery.

The periods of following the symptoms were before surgery, 1 month after and 6 month after surgery.

**Results**

Rhinoseptoplasty (RSP) for the first time was prepared in 98 (81.3%) patients. In 22 (18.7%) patients revision RSP has been made, because complications after previous RSP has been occurred. Early and late post RSP complications in 120 patients admitted and operated a ENT Clinic, University Hospital, Skopje in the period of 2005-2012 has been observed (Table 1).

**Table 1: Early and late post RSP complications in 120 patients admitted and operated a ENT Clinic, University Hospital, Skopje in the period of 2005-2012.**

Year	Number of patient	Total complication	Early complication	Late complication
2005	16	6 (37.5%)	3 (50%)	3 (50%)
2006	15	5 (33.3%)	3 (60%)	2 (40%)
2007	12	4 (33.3%)	3 (75%)	1 (25%)
2008	16	5 (31.2%)	3 (60%)	2 (40%)
2009	12	5 (41.6%)	3 (60%)	2 (40%)
2010	14	5 (35.7%)	2 (40%)	3 (60%)
2011	13	4 (30.7%)	2 (50%)	2 (50%)
2012	12	5 (41.6%)	4 (80%)	1 (20%)
<b>Total</b>	<b>120</b>	<b>39 (32.5%)</b>	<b>22 (56.4%)</b>	<b>17 (43.5%)</b>

Early postoperative complications have been observed in 22 (18.3%) patients: Oedema and ecchymosis in 17 (77.2%) patients, periorbital haematoma in 4 (18.1%), septal haematoma in 1 (5%) and infection and skin necrosis was not registries (Fig. 1).

Patients with late post-operative complications have been observed in 17 patients: nose breathing disorders in 5 patients (29%), nasal septal perforation in 2 (12%) patient, deviations and irregularities of the nasal dorsum in 2 (12%) patients, columella retraction in 2 (12%), patients with Polly

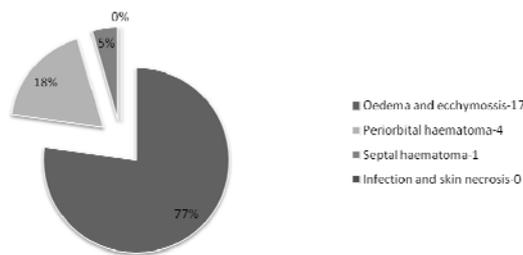


Figure 1: Patients with early postoperative complications (in the first 6 weeks).

back deformity were 3 (17%), nasal tip ptosis and tip distortions have been in 2 (12%) patients and paranasal callus in 1 (6%) (Fig. 2).

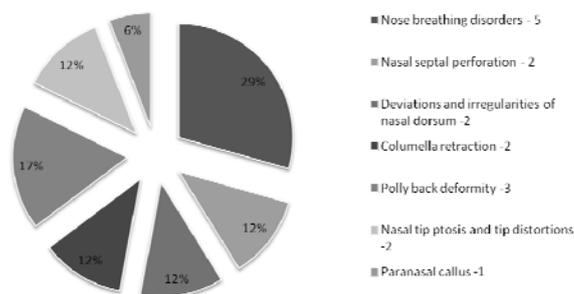


Figure 2. Patients with late post-operative complications.

We observed that the largest number of the patients thinks that realized operative intervention will bring back their self-confidence 43 (39.8%), will have influence of their profession 11 (10.18%), expect changes in their lives 32 (29.6%), social status will be better 13 (12.04%) and the people after RSP will behave different with them 9 (8.3%) These results are statistically significant (Table 2).

**Table 2: Patient's distribution according to their expectations from RSP.**

Patients expectations from RSP	N	%
Self-confidence will be back	43	39.81
Will have influence of their profession	11	10.18
Will change their lives	32	29.63
Their social status will be better	13	12.04
After RSP the other people will behave different with them	9	8.33
<b>Summary</b>	<b>108</b>	<b>100.00</b>

Chi-square=42.18; df=4; p=0,000000.

Also, we have been presented the average scores from different questions which are included in the Brief Symptom Inventory (BSI) test, analyzed in three periods of time: pre-operatively, 1 month post-operatively, 6 month and 1 year after operation. The statistical analyze showed that results with high significant scores (p = 0.02). The result scores after 6 months and 1 year after surgery has been not statistically significant (Table 3).

**Table 3: The Brief Symptom Inventory (BSI) (score from 1-10).**

	Pre-operative	1 month	6 month
Self-confidence	6.8	7.6	7.7
Will have influence of their profession	7.1	7.7	7.7
Will change their lives	8.4	8.6	8.7
Their social status will be better	7.2	7.8	7.7
After RSP the other people will behave different with them	8.5	8.2	8.8

Friedman ANOVA Chi Sqr. (N = 5, df = 2) = 7.89 p =0.0193; Preoperative/ 1 month Wilcoxon Matched Pairs, Z=2.02, p=0.043; Preoperative/ 6 months Wilcoxon Matched Pairs, Z=2.02, p=0.043; 1 months/ 6 months p>0.05.

## Discussion

In our study we presented, that besides of postoperative deformities a lot of other risks and complications have to be considered. An early analysis is essential for prevention severe systemic or life-threatening complications which are occurring in 1.7-5% of rhinoplasty cases. Intracranial complications are rare.

Frequency of complications in our study was 6.5% rate. This rate generally depends on surgeon's experience. Furthermore, skin and associated soft tissue complications occur in up to 5.5% of cases. Severe systemic or life-threatening complications occurred in 2% of rhinoplasty cases. In our experience only 1 intracranial complication was observed. Hemorrhage is reported and prevalence varies in 3, 5% which is similar to the results founded in the literature [30].

In our study special risks and complications in first 6 weeks after surgery were observed and they were the same as results according to the literature. Most of the patients (29%) were complained of nose breathing disorders. Early and late psychological complications and transient episodes of anxiety or depression were observed in only two cases that had serious psychological body dysmorphic disorder and needed psychiatric help.

According to the literature, the complication rate for nasal surgery varies from 4-18.8%. Skin and associated soft tissue complications occur in up to 10% of cases [31, 32].

We tried to make a "patient's profile" which will help us to choose which patients are "good" and which are "bad" candidates for operative intervention.

That will be useful for the surgeon to make a right decision about the operative course, especially in the post-operative course in making difference between surgeon's expectation and expectation of the patients [33, 34].

**Conclusion:** Rhinoseptoplasty is based on experience. Good postoperative results are not always guaranty for good final result; inadequate operative technique can make complications and bad results. Rhinoseptoplasty is associated with specific risks and complications. An analysis of revision

surgeries can provide information on frequency and types of postoperative deformities. Reports in the literature are based on different parameters which makes comparison difficult. There are much more papers on revision techniques than on analysis of deformities.

Our study is based on observation of early and late deformities in rhinoseptoplasty, their frequency and possible factors. Our goal was not to emphasise different techniques for revision surgery but to focus on the types of deformities and their prevention. The inhomogeneous patient's population is an additional problem too. This is why evidence is only based on description and comparison.

Considering the psychological risks after rhinoseptoplasty, our expectation were, through the testing of the psychological profile of the person, patient to recognize and to have a mature decision for eventual change on his nose, which change will make influence not only to the face but to the soul too.

Besides knowledge of literature and techniques a critical surgeon is a prerequisite for reliable results. Knowing the risks, mistakes should be identified and avoided in the future. A complication as cause of an undesirable result should only be assumed if there is no evidence of a mistake in patient selection, preoperative planning and operative technique.

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