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Original Research Article

Analysis of revision rhinoplasty; what is the problem and the management?

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ABSTRACT

Background: Revision rhinoplasty is reported to occur in 8% to 15%. Reoperation should be performed to correct deformities that were not diagnosed or addressed in previous surgeries, such as those from poor planning, performance and poor surgical healing. The aim of the study was to evaluate the problem of each case seeking revision rhinoplasty and different modalities for management to reach satisfactory results.
Methods: This is a prospective study which was done in plastic surgery department, Menoufia University Hospitals over the period from December 2017 to December 2019. The study included 31 patients underwent previous rhinoplasty.
Results: Patients were selected from the outpatient clinic, 31 patients who had varieties of nasal deformities. Mean age of the patients was 31.7 years. Female represent the majority of patients by 80.60% and males were 19.40% with significant difference in satisfaction (p=0.05). Patient satisfaction after surgery and it was excellent for 14 cases (45.20%), good for 9 cases (29 %) and it was fair in 8 cases (25.8%). Rhinoplasty outcome evaluation (ROE) score was correlated with patient satisfaction grades as mean of ROE score in excellent group was 67.5; in good group was 58.3; while in fair group was 38.8 with significant p value (0.001).
Conclusions: Excellent patient satisfaction is related good planning, close follow up time, and less complication. Cartilage grafts especially rib cartilage is considered a lifeboat for revision rhinoplasty. We can link grades of patient satisfaction to ROE score.

Keywords: Patient satisfaction, Revision rhinoplasty, ROE score

INTRODUCTION

Nasal surgery is extremely difficult for the surgeon to master, because of the complex three-dimensional anatomy and a relationship of hard and soft tissue, healing, scar contracture, surgical access, and manipulation. Therefore, it is also difficult for patients to understand and conceptualize the limitations of their own surgery.[1]

Most often, reoperation of the nose is because of patient dissatisfaction, resulting from poor diagnosis, poor explanation, poor planning, and poor execution by the surgeon. Inexperienced surgeons do not know what they can or cannot achieve and tend to oversell the procedure. It is only through poor results that surgeons gain experience.[2]

Revision rhinoplasty of the nose is reported to be 8% to 15%. Re-operation should be performed to correct deformities that were not diagnosed or addressed in previous surgeries, such as those from poor planning and/or performance and poor surgical healing. Disturbance of the skin and subcutaneous tissues during primary surgery may lead to postoperative scarring and a late onset deformity or asymmetry.[3]

Postoperative results take months to years before becoming fully apparent, and the novice surgeon is unable to reliably predict the outcome. There are multiple pitfalls that must be addressed and avoided by the nasal surgeon; Pitfalls in nasal surgery can easily result in complications.[4]

The experienced nasal surgeon learns to anticipate the pitfalls and navigate between the hazards. Most surgeons learn when to operate, but it takes time and complications to learn when to stop. Over operation of the nose often results in a poor result. Nowhere is this truer than in cosmetic nasal surgery; the enemy of good is better.[5]

Lack of planning, individualizing the operation, over operation and aggressive surgery often result in asymmetric volume reduction of the tip, asymmetry, loss of tip support, excessive scarring, and cephalic alar retraction. Overaggressive surgery and technical errors can result from poor scars, especially in external rhinoplasty, perforations, cartilage displacement, incorrect suture placement, and supratip scarring.[6]

Revision rhinoplasty adds another layer of complexity to an already challenging operation - this challenge increases exponentially with each additional revision procedure. One method to classify post rhinoplasty deformities is anatomically by upper third, middle third, and lower third.[7]

Revision rhinoplasty is generally more complex procedure than primary rhinoplasty because the tissues have scarred and been disrupted from the previous surgery. In addition, revision patients are generally stressed and traumatized from the previous surgery, which aids in complicating the psychological sides of an already complex task.[8]

Because traditional metrics such as mortality and morbidity mean very little in rhinoplasty, there is a need for evidence-based conclusions in order to assess the actual outcome. An important way to achieve progress in this gap lies in determining the degree of patient satisfaction after the surgery. In this context, many studies have been conducted to validate a questionnaire that evaluates patient satisfaction after rhinoplasty by assessing self-image and quality of life.[9]

We aim to evaluate the patient satisfaction regarding revision rhinoplasty using rhinoplasty outcome evaluation (ROE) score and factors affecting patient satisfaction.

METHODS

We undergo through a prospective study which was done in the plastic surgery department, Menoufia University Hospitals over the period from December 2017 to December 2019. The study included 31 patients underwent previous rhinoplasty.

We developed clear inclusion and exclusion criteria should reached as careful patient selection will greatly diminish reoperation of the nose.

Inclusion criteria

Nasal deformities after primary rhinoplasty, post-traumatic nasal deformities after rhinoplasty, good general condition of the patient, age range from 18 to 50 years those with reasonable expectations, who seem to understand the goals and objectives of the treatment plan were included.

Exclusion criteria

Patients with post-burn nasal deformity, congenital nasal deformity, age less than 18 years and more than 50 years, poor general condition of the patient and psychologically unstable patients with unrealistic expectations were excluded from the study.

Patients were subjected with full history taking as regards: age, sex, marital status, special habits of medical importance (such as smoking) or any other medical problems, history of nasal functional problems and treatment and history of previous surgery and nasal surgery.

A detailed physical examination was conducted to evaluate the aesthetic and functional elements that comprise the deformity. The external nasal deformity was evaluated and nasal analysis. This will include: limiting physical factors such as extensive septal deformities, thick sebaceous skin, flaccid nasal cartilages, excessive size, abnormal width and tip projection, extremely small nasal anatomy, and lack of nasal seal or alar base and presence of external scarring.

Intranasal evaluation with nasal speculum and adequate lighting was performed in every patient. All intranasal abnormalities also identified and recorded.

Preoperative investigations included radiography and other imaging techniques: Patients with functional complaints were subjected to computerized tomography with 3D of the facial skeleton to evaluate septal deviation, turbinate hypertrophy, and nasal sinuses problems.

Outcome measures

Patient satisfaction is classified as fair when they are not happy with the results; good, when the patient had reached a desired goal; and excellent, when the patient had a perfect match with the desired plan.

They are assisted by ROE scale scoring. The ROE scale consists of 6 questions, 5 of which evaluate nasal shape and the patient's perception of nasal appearance

(physical, emotional, and social) and 1 evaluates breathing ability.

In the ROE questionnaire, patients were asked 6 questions about the degree of their satisfaction. Each question was answered on a scale ranging from 0 (the lowest satisfaction) to 4 (the higher satisfaction). The sum of the scores was divided by 24 and multiplied by 100, which leads to the final score.[10,11]

Study procedures

Preoperative markings of the nose were done (dorsal aesthetic lines, osteotomies and trans-columellar incision). The patient was in a supine position (anti-trendelenburg) with a head ring. All our operations were done under general anaesthesia with endotracheal intubation, and the tube was central oral down.

Scrubbing of nose and face with betadine solution and patient draping. Infiltration with vasoconstriction agent (adrenaline 1/200.000) and 2% lidocaine was done for the nasal tip, septum, incision sites, osteotomies site and alar base and columella

The open approach was used in 20 patients. Infra-cartilaginous (rim) incision in plus transcolumellar incision (stair step design or VY design in tertiary rhinoplasty), and closed approach was used in 11 patients. Dissection in supraperichondrial and subperiosteal level and creation of pockets for grafts insertion, without any excessive sharp dissection on the overlying skin and soft tissue, had been done. Exposure of the LLC, ULC and nasal dorsum up to the nasofrontal angle was done if it's required in the case.

Dissection of the interdomal area, the release of the fibrous tissues from previous operations was done. Exposure of the nasal septum bilaterally and septal cartilage graft was harvested (quadrangular graft with 8-10 ml dorsal and caudal L- strut was left in place attached to the nasal spine) if it's not violated by previous surgery.

Costal cartilage harvest

Infiltration of the incision with (1:200000) saline adrenalin solution and 2% lidocaine was done.

The incision along the infra-mammary line was done. Then, we undergo exposure of the ribs. The anterior perichondrium was incised, and then performs subperichondrial dissection all around the rib cartilage. A section of the rib cartilage was freed by full-thickness incision. After graft was harvested, it is mandatory to test the presence of a pneumothorax by a sustained positive pressure breath while the wound was filled with saline. Then, drain was inserted for two days.

However, it is very important to assess the availability of septal cartilage when simultaneously reducing the cartilaginous dorsum. Septal fracturing and collapse can occur if the septum was weakened in the primary operation

Statistical analysis

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 21, SPSS Inc. USA). Data were described using mean and standard deviation (SD) and frequencies according to the type of the data (quantitively or categorical respectively). Chi-square and fisher exact test were used for comparison of qualitative variables. We used one-way ANOVA test to compare between means of categorical and numerical data. Significance level (P-value) was adopted, i.e. $p<0.05$ for interpretation of results of tests of significance.

RESULTS

This is a prospective study which was done in the plastic surgery department, Menoufia University Hospitals. The study included 31 patients with nasal deformity and underwent previous rhinoplasty prepared to revision rhinoplasty over the period from December 2017 to December 2019.

Patients were randomly selected from the outpatient clinic, thirty-one patients who had varieties of nasal deformities. Mean age of patients 31.7 year.

Table 1: Sociodemographic data of the patients.

Characteristics	Number	%
Age (mean±SD)	31.7±9.4	
Sex		
Male	6	19.40
Female	25	80.60
Diabetes		
Yes	2	6.50
No	29	93.50
Hypertension		
Yes	0	0
No	31	100
Smoking		
Yes	6	19.40
No	25	80.60
Marital Status		
Divorced	5	16.10
Married	12	38.70
Single	13	41.90
Widow	1	3.20
Psychatric history		
Yes	0	0
No	31	100

Table 2: Surgical procedures and correlation with patient satisfaction.

Characteristics	Number	%
Reason of revision		
Aethetic	22	71
Functional	4	12.90
Both	5	16.10
Time of last surgery		
6-12 months	11	35.50
>1 year	20	64.50
Surgical incision		
Closed	11	35.50
Open	20	64.50
Anasthesia		
General	31	100
Graft used		
Auricle	9	29.03
Rib cartilage	13	41.93
No graft and septum used	9	29.03
Osteotomies	25	80.60
Operative time (mean±SD)	96.1±17.8	
Follow up time in months (mean±SD)	9.8±3.2	

Female represent the majority of patients by 80.60% and males were 19.40% with significant difference in satisfaction (p=0.05) and associated morbidities as diabetes were 2 patients with 6.5% of total and none of them had hypertension, six patients were smokers with percentage 19.40% and no patients gave a history of psychological diseases and for marital status the majority were single by 41.90% of the total, 38.70% were married, 16.10%were divorced and only one patient was widow with no significant affection of patient satisfaction.

Reason of revision were due to aesthetic cause in 22 patients by 71%, functional cause in 4 patients by 12.90% and 5 patients by 16.10% had both causes. Time of last surgery was 6 months to 12 months in 11 patients; and 20 patients more than year.

The cause of the revision surgery after analysis was Tip problems was in 10 patients, dorsum problem was in 23 patients, septum problem was in 10 patients, thick skin problem was in 11 patients and 7 patients had thick skin. Interestingly, 4 of the cases had single diagnosed problem, 13 of them had two problems, 9 of them had three problems, 4 of them had four problems and only one case had all five key area problems. 4 of the cases had single diagnosed problem, 13 of them had two problems, 9 of them had three problems, 4 of them had four problems and only one case had all five key area problems.

Table 3: Post-operative complication and correlation with patient satisfaction.

Post-operative complication	Excellent (n=14)		Good (n=9)		Fair (n=8)		P value
	Number	%	Number	%	Number	%	
Persistent edema	2	14	6	66.60	3	37.50	0.037
Collemelar necrosis	0	0	0	0	0	0	1
Bleeding	0	0	1	11.20	2	25	0.04
Infection	0	0	0	0.00	0	0.00	1
Deviation	0	0	2	22.30	4	50	0.01
Skin alteration	0	0	0	0.00	0	0.00	1
Nasal obstruction	0	0	0	0.00	1	12.50	1

Table 4: Correlation between grades of patient satisfaction and ROE scores.

Patient satisfaction	Number	Percentage (%)	ROE scores
Excellent	14	45.20	67.5
Good	9	29	58.3
Fair	8	25.8	38.3

Surgical incision was closed in 11 patients by 35.50% and open in 20 patients (64.50%). General anaesthesia was used to all patients. Grafts used in 9 cases as auricular grafts, 13 rib cartilages and no graft used in 9 cases with high patient satisfaction and ROE score with Rib cartilage (p=0.016). Osteotomy was done in 25 cases. The mean time of surgery was 96.1 minutes; mean time of surgery in excellent group was 93.5 min while in fair group 107.2 with significant p value (0.001). Cases were followed for a mean of 9.8 months.

Persistent oedema was developed in 11 patients (35.50%), no one developed collemelar necrosis, and 4 patients had bleeding (12.90%) and no one had postoperative infection or skin alteration, 6 patients with nasal deviation only one case had nasal obstruction with 3.20%. Patients with excellent Satisfaction and high ROE

score (67.5) have less oedema and bleeding, and deviation compared with patients with fair satisfaction and low ROE score (38.8) have high persistent, bleeding, and nasal rates with significant p value (0.03, 0.04, and 0.01 respectively).

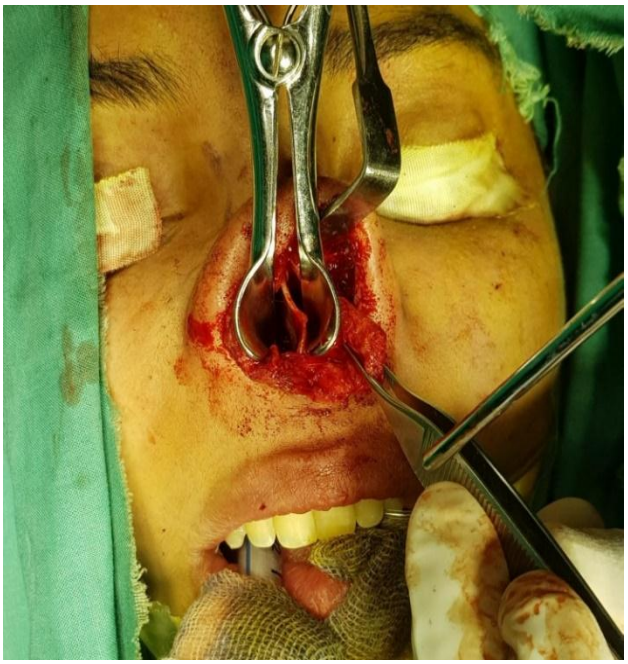

Figure 1: Remnant of septum cartilage.

Figure 2: Costal cartilage harvest.

Patient satisfaction after surgery was excellent for 14 cases (45.20%), good for 9 cases (29 %) and it was fair in 8 cases (25.8%). ROE score was correlated with patient satisfaction grades as mean of ROE score in excellent group was 67.5; in good group was 58.3; while in fair group was 38.8 with significant p value (0.001).

Figure 3: (A-C) frontal, lateral, basal view of patient seeking revision after 15 months of primary rhinoplasty, (D-F) frontal, lateral, basal view 6 months after revision rhinoplasty.

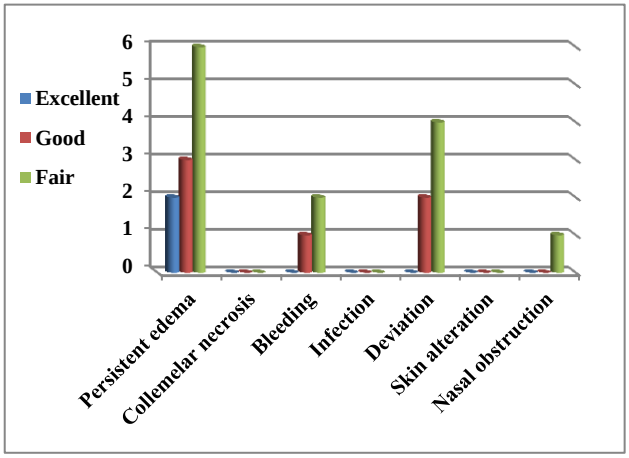

Figure 4: Complication rates between different grades of patient satisfaction.

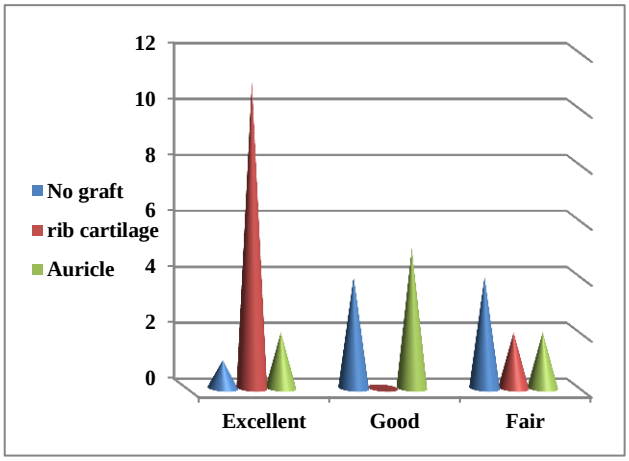

Figure 5: Grafts used and correlation with grades of patient satisfaction.

DISCUSSION

A precise operating plan is mandatory, we believe that providing patients with a satisfactory degree of information about the goals, limitations and possible complications of the surgery is fundamental for the exploration of expectations, motivations and perceptions. This is an important function in identifying patients who would benefit from the revision.

In our study we recruited 31 patients whom went previous surgery for their nose either for functional or aesthetic purposes or for both the majority of them were female by 22 patients and 9 males, and age ranged from 18 to 44 years old. The reasons for undergoing revision rhinoplasty were aesthetic in 71% of patients, functional in 12.9%, and a combination of both aesthetic and functional in 16.1%

While Ozan et al, study had the median average age at the time of revision surgery was 34 years, reasons for undergoing revision rhinoplasty were aesthetic in 55% of patients, functional in 15%, and a combination of both aesthetic and functional in 30%.[12]

Regarding Sociodemographic data; the majority were single by 41.90% of the total, 38.70% were married, 16.10% were divorced and only one patient was widow, while Vuyk et al, had revision rhinoplasty study, 32 patients (59%) were married, 3 (6%) were divorced and 19 (35%) had never been married.[13] According to our results, all three groups experienced significant improvements in satisfaction after revision rhinoplasty, In his study had Three patients gave a history of psychiatric diseases by 6% percentage and these patients went through a more detailed session of analysis to reach a common ground about the previous problem and the required results which make selection bias in the study. While in our study, we did not have any of our patients with psychiatric disorders.

We had 18 patients who did a single previous surgery, 8 patients went through two times rhinoplasty and 5 patients did rhinoplasty three times prior to our operation. While Yu et al, showed 88.4%, 38 patients had been submitted to only one previous rhinoplasty. Only 3 patients (7%) had undergone 2 previous surgeries and 2 patients (4.6%) had been submitted to more than 3 previous rhinoplasties.[14]

There was an inverse correlation between patient satisfaction scores and ROE score and number of revisions. The first revision rhinoplasty led to a significant increase in ROE scores, whereas trends of improvement of ROE scores were found less after two and three to six revision rhinoplasties.

We had the time interval between the last surgery and our surgery was less than 6 months in 8 patients, from 6 months to 12 months in 3 patients and more than a year in 20 patients Most patients (64.5%) reported that the last surgery had been performed more than 12 months before. while in Ozan et al, study This period ranged from 13 months to 16 years, with a mean of 4.6 years. Only two patients had undergone surgery less than 6 months before the last procedure.[12]

During preoperative analysis we determined the problem the patients seeking rhinoplasty for in this time to find The cause of the revision surgery after analysis was Tip problems was in 10 patients, Dorsum problem was in 23 patients, septum problem was in 10 patients, thick skin problem was in 11 patients and 7 patients had alar problem. With dorsum 74.20% of main complains. In Charles et al, study they show that 4 of the cases had single diagnosed problem, 13 of them had two problems, 9 of them had three problems, 4 of them had four problems and only one case had all five key area problems, The nasal dorsum was the most frequent key area of concern in revision surgery (77%), which coincides with our results.[15]

In 11 patient we used the closed incision to do the revision rhinoplasty which gave us a limited access yet a better fixation of grafts and shorter postoperative recovery while in 20 we used open technique for better visualization and dissection Such findings contrast with the results of other studies such as Pearlman et al, where the closed technique was predominant and used in 68.4% of rhinoplasties. In our study, both closed and open rhinoplasties were equivalent in generating patient satisfaction in the long term with no significant difference as among 14 cases with excellent satisfaction 7 was done by open technique and 7 was done by closed technique.[16]

In revision rhinoplasty, the use of grafts is indispensable when large amounts of tissue are required. Auricular or costal cartilage grafts had been used in nearly one-third of their revision patients. Considering that grafting is generally needed in severe nasal deformities, For this reason, surgeons should not hesitate to use grafts if We used rib cartilage grafts to 13 patients and auricular cartilage in 9 patients as to make the grafts that support the nose in case of deviancy of the nasal septum cartilage peter et al, did in his research. In 19 of the 46 patients, grafting material had been used for revision rhinoplasty, 6 cases with auricular concha graft, and allogenic rib cartilage in 13 case had been used for the revision procedure.

As for the satisfaction of patients through our study 54.83% of them were satisfied in excellent way, 22.58% of them had good satisfaction and 22.58% were fairly satisfied, that correlate with ROE score. According to our literature review, we are considered the first study that held a correlation between grades of patient satisfaction (excellent, good and fair) and ROE score.

We found that male rhinoplasty patients were significantly more likely to be dissatisfied than female

patients. This is in agreement with prior studies. Sarwer et al, found that male rhinoplasty patients were more likely to be depressed and dissatisfied than female counterparts.[18]

We followed up our patients for more than a year in 12 patients, for 6 to 12 months in 13 patients and 6 of our patients were followed for a period less than 6 months in order to follow up the satisfaction of the patients and incidence of complication. Peter et al, thinks that the biggest differences between the preoperative and postoperative scores in their study are associated with the shorter mean follow up time (13 months). Longer follow-up periods may be associated with late complications; however, we found no relationship between the follow up time and the satisfaction of the patient.[19]

Throughout our work we encountered some complication in some of our patients in the form of persistent oedema in 10 patients, bleeding in 4 patients, deviation in 6 patient, and one patient with nasal obstruction no infection, and no skin colour alteration While Hellings and Nolst Trenite studies patients reported skin changes with changes to dry and oily skin and depigmentation in the bridge area. A complaint reported by one patient was permanent pain in the columella due to the reaction to a nylon suture.[20,21]

At the end of the discussion, it is important to remember that we have the ultimate decision-making power when it comes to accepting a patient as a surgical candidate. Rhinoplasty is not cancer surgery. It is at its essence an elective procedure. With that in mind, we must carefully balance the following factors: Are the patient's expectations reasonable, Are their goals achievable in our hands? Is the patient emotionally ready to proceed with revision surgery? Is the patient a good "fit" for our practice and style of care? If we can say yes to the criteria above, we have a high likelihood of being able to help the patient and form a healthy doctor–patient relationship. There are few joys as great as achieving a good result for a revision rhinoplasty patient. By restoring form and function, we not only rehabilitate the nose but the patient and their well-being as well.

CONCLUSION

Patient satisfaction is required to be assessed after revision rhinoplasty. Excellent patient satisfaction is related good planning, close follow up time, and less complication. Cartilage grafts especially rib cartilage is considered a lifeboat for revision rhinoplasty. We can link grades of patient satisfaction to ROE score.

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