Closed Septorhinoplasty: Personal Experience and Tips

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ABSTRACT

Introduction: Rhinoplasty is a surgery to re-shape the nose. The goal of the surgery is to fashion a natural nose that is in harmony with its surrounding facial features.

Objective: Because by the end of the 20th century it became apparent that the pendulum had swung too far in favor of the external approach, the role of endonasal approach is verified in this study.

Patients and Methods: It is a retrospective study in which 165 patients who underwent closed septorhinoplasty or rhinoplasty alone in the period from 2007 up to 2011 were studied and their charts were reviewed. They were mainly reduction surgeries which consisted of: Intercartilagenous incision, dorsal hump removal, separation of the upper lateral cartilage from the nasal septum, medial and lateral osteotomies. The only tip procedures were cephalic excision of the lower lateral cartilage for tip bulbosity, and alar base reduction for excessive flaring.

Results: Patients’ ages ranged from 17-45 with a mean of (23.26) years. The majority of patients (156) who underwent septorhinoplasty or rhinoplasty alone in the period from 2007 up to 2011 were studied and their charts were reviewed. They were mainly reduction surgeries which consisted of: Intercartilagenous incision, dorsal hump removal, separation of the upper lateral cartilage from the nasal septum, medial and lateral osteotomies. The only tip procedures were cephalic excision of the lower lateral cartilage for tip bulbosity, and alar base reduction for excessive flaring.

Conclusion: The author puts a number of tips and recommendations based on his own experience in closed rhinoplasty with a conclusion that quite good results could be achieved with this approach.

INTRODUCTION

The most common indication for rhinoplasty is cosmetic improvement. The goal of the surgery is to fashion a natural nose that is in harmony with its surrounding facial features. Cosmetic deformities can be classified into nasal pyramid problems and nasal tip problems. Abnormalities of the nasal pyramid are simpler to deal with than those of the tip. The over projected nasal dorsum or dorsal hump is the most common reason patients present for cosmetic alteration of nontraumatic nose. A second indication for rhinoplasty is to improve nasal breathing. The septorhinoplasty is indicated for nasal obstruction when the deformity is such that correction of the dorsal deformity is necessary to straighten the septum [1-4].

Most corrections of the long nose associated with a hump or dorsal deformities follow the basic principles formulated by Jacques Joseph in the first half of the 20th century [5,6]. The classic Joseph rhinoplasty is preformed through intercartilagenous and full length transfixion incision and consists of: Hump reduction, lowering of the cartilaginous dorsum, triangular shortening of the caudal edge of the nasal septum, lateral osteotomies with infracture and alar cartilage cephalic rim excision [7-11].

Goodman and Charles popularized open rhinoplasty in the 1970s with the introduction of a columellar incision to produce unparalleled exposure [12]. By the end of the 20th century it became apparent that the pendulum had swung too far in favor of the external approach and that most patients would benefit from endonasal surgery.

In the present paper, the author reports his own experience with a retrospective review of 165 patients who underwent septorhinoplasty or rhinoplasty alone by the closed endonasal approach.

PATIENTS AND METHODS

It is a retrospective study in which patients who underwent septorhinoplasty or rhinoplasty alone in the last 4 years were studied and their charts were reviewed. The study included 165 patients who had predominantly septorhinoplasty by the closed endonasal approach, and all surgeries were performed by the author. The surgeries were done in the teaching and the private hospitals in Mosul City, Iraq in the period from 2007 up to 2011. The patients’ ages ranged from 17-45 with a mean of (23.26) years. There were (75) males and (90)
females and the follow-up period ranged from 1-3 years.

All patients had preoperative photographs in the following positions: Frontal, basal, right and left lateral, and right and left oblique.

The majority of patients (156) had septorhinoplasty, only (9) had rhinoplasty alone.

The surgical technique:

All patients had the surgery done under general endotracheal anæsthesia with supine position and 30 degrees head elevation.

1- Septoplasty:

It aims at a conservative resection of the septal cartilage, reinsertion of the regular pieces of excised cartilage into the septum and reconstruction of the caudal septum and columella. Sometimes it needed removal of a big piece or the whole of septal cartilage, re-fashioned and inserted as a free graft into a tunnel in the columella and fixing the graft in place by 3/0 vicryl suture (Fig. 1).

After completion of septoplasty, the hemitransfixion incision was partially closed using a single 3/0 vicryl stitch in the posterior half of the incision. Intranasal silastic splints were inserted and suture fixed using No. zero cutting silk suture, and assuring that the anterior edge of the silastic was situated behind the site of hemi or transfixion incisions.

2- Dorsal hump removal:

Rhinoplasty was commenced with bilateral intercartilagenous incisions and transfixon incision which extends to less than the columellar half length. Elevation of the musculo-aponeurotic layer is limited laterally to the lateral extents of the hump. The cartilaginous and bony parts of the hump were removed in one piece in the majority of cases (in block resection) using the knife and a 10mm osteotome (Fig. 2).

Hump removal was followed by rasping of the bony dorsum to smooth the bony edges. During this step the author found that after personal satisfaction with the dorsal profile, further lowering of the dorsum about 1mm is needed to avoid reformation of a hump, either immediately after lateral osteotomies or later in the ensuing few weeks or months.

3- Separation of the ULC from the septum:

In the majority of patients the upper lateral cartilages were separated extramucosally from the septum using a scissor cutting the medial edge of the ULC flush with the septum, and its medial border sometimes lowered to be at the same level with the bony nasal dorsum. A triangular piece of the lower medial edge of ULC might need excision to prevent its protrusion into the nasal vestibule (Fig. 3). The nasal septum was checked for its height and irregularities by palpation and exposure. Sometimes the knife was used to remove dorsal cartilaginous irregularities by moving the knife blindly cephalocaudally.

4- Osteotomies:

Medial osteotomies are done by using a 10mm osteotome which was inserted between the nasal septum and the nasal bone. Just below the intercanthal line, it is angulated 20 degrees laterally and a dehiscence was created in the anterosuperior part with the aid of a hammer (Fig. 4-A). This step was done in most patients with humps and in all patients with dorsal bony deviation. Lateral osteotomies are done by using a 2mm osteotome by percutaneous approach in all patients. Multiple fractures are done starting from bellow upwards and in an oblique fashion in a way that it meets the superomedial dehiscence (Fig. 4). Manual pressure was applied on the nasal side walls to get infracture. In our series, intermediate osteotomies were not done as the need for such step was judged unnecessary during surgery.

5- Tip modification:

For bulbous tip, cephalic excision of a strip of the lower lateral cartilage was done by retrograde dissection of the LLC from the intercartilagenous incision, thus preserving the skin without the need for another skin incision (Fig. 3-D). When excessive alar flaring was present, alar base reduction was done and the wound was closed using 6/0 nylon suture.

6- Final adjustment of the dorsal profile:

Assessment of the profile was needed to find any irregularity or supratip depression. In such case a dorsal cartilaginous graft was inserted. The graft is taken either from the sepal cartilage or from the excised alar cartilage. A vicryl 3/0 was passed into the graft, and the free end of the suture is knotted behind the graft. The needle is passed from inside to outside holding the graft which is positioned in the desired place. The suture is cut about 2cm from the skin and it is taped to the skin (Fig. 5).

7- Nasal packing and external splint application:

Broad spectrum antibiotics were given for 10 days, especially when grafts were inserted.
Fig. (1): (A) Septal cartilage preparation, (B) Dissection of columellar tunnel. (C,D) Insertion of the cartilage into the pocket.

Fig. (2): Steps of rhinoplasty, (A) Intercartilagenous incision, (B) Elevation of musculo-aponeurotic layer, (C,D) Hump removal by 10mm osteotome.
Fig. (3): (A,B) Separation of the ULC from the septum, (C) lowering and trimming of the ULC, (D) Retrograde dissection of the LLC.

Fig. (4): (A) Medial osteotomy, (B,C&D) Lateral osteotomies.
The external nasal splints as well as the intra-nasal silastics were usually removed one week after the surgery. Sutures of the dorsal grafts were cut flush with the skin at the time of splint removal, while the sutures of alar base excision were left to be removed 3 days later. The patient is seen 1-2 weeks later to make assessment of the results of surgery and the first postoperative photos were taken. The majority of patients had their ecchymosis subsided at that time. The next assessment was done a month later. The second postoperative photos were usually taken 6 months after surgery, by that time decisions of revision surgery may be taken.

Follow-up period was about 1-3 years, and in each visit, a good time was spent on listening to the patient’s notes about the nose shape, complaints of nasal block and if needed detailed examination including endoscopy may be needed. Investigations like CT scan of paranasal sinuses were requested if there is suspicion of sinusitis.

RESULTS

Rhinoplasty was performed by closed (endonasal approach) in 165 patients over the last 4 years. There was [75 (45%)] males, and [90 (55%)] females. The age range was from (17-45) with a mean of (23.26) year. In 9 patients (5.5%) rhinoplasty was done without concomitant septal surgery because either the septum is not deviated or it has been previously operated on. In patients who had septoplasty, 6 patients (3.63%) had revision surgeries and in 16 patients (10%) there was a need, at the time of surgery, for cartilage removal and reinsertion in the columella. Table (1) demonstrates the demographics of patients and the surgical procedures.

The cosmetic problems were:

1- Dorsal humps were present in 154 patients (93%).
2- Bony dorsal deviation was present in 81 patients (49%) with or without humps.
3- Cartilaginous deviation was present in about 55 patients (33.3%), either alone or associated with bony deviation.
4- Tip bulbosity was present in about 30 patients (18.8%). They underwent cephalic excision of the lower lateral cartilage by retrograde dissection from the intercartilagenous incision (Fig. 6).
5- Alar base reduction was done in 18 patients (11%) with excessive alar flaring (Fig. 7).

During the course of surgery, supratip saddle mainly followed hump excision because of excessive removal of its cartilaginous component, and this was treated with dorsal cartilaginous graft in 18 patients (11%).

The results were assessed when the splints were removed and postoperative photographs were taken about 2-3 weeks postoperatively. The photographs were repeated 6 months later. Table II demonstrates the surgical functional and cosmetic problems in the patients.

The success of surgery was assessed by, first the relief of nasal block, and second by the patient satisfaction with the new nose shape. In 20 patients (12.12%) there was postoperative nasal block which was assessed for other concomitant problems like allergic or non allergic rhinitis. Fifteen patients (9%) had improvement in their nasal breathing by medical treatment with nasal steroids. Residual septal deviation was found in 3 patients (1.8%). Revision septoplasty was needed to improve the nasal breathing with or without submucosal diathermy of the inferior turbinates. In 2 patients (1.2%) submucosal diathermy alone was needed for improving the nasal breathing (Table 3). There is no rhinomanometry facility in our centers so the assessment was done based on clinical grounds.

Regarding the cosmetic results, in our series, revision surgeries were done in about 16 patients (10%). Residual humps and dorsal irregularities were present in 7 patients (4.2%) and pollybeak deformity in 3 patients (1.8%). Deviation in the cartilaginous part was present in 3 patients (1.8%) owing to septal deviation, while deviation in the bony dorsum was found in 2 patients (1.2%). In one patient (0.6%), supratip saddle was present.

In all but one patient, the revision surgery solved the cosmetic problems. One patient with residual hump needed a second revision for residual dorsal irregularity. Patients with cartilaginous deviation underwent revision septoplasty with removal of the septal cartilage and reinserting it as a free graft in a tunnel in the columella, and it was enough for correction of the deviation, while in those with bony deviation osteotomies were needed for correction. The patient with supratip saddle had a combination of rasping and dorsal cartilage graft taken from the septum to get the acceptable profile alignment.

In 12 patients (7.2%), the results were unappealing to the author. In 5 patients there was residual deviation in the bony dorsum, in 4 patients residual humps were present, and slight cartilaginous deviations were present in 3 patients. Those patients were satisfied with the nose shape and did not request revision surgery (Table 4).
Fig. (6): Preoperative (above), postoperative (below) photos of a patient who had septrhinoplasty: Hump removal, straightening of deviated dorsum and cephalic excision of LLC.

Fig. (7): Alar base excision for alar flaring, preoperative (left), and the postoperative (right).

DISCUSSION

Because the external approach became increasingly used in rhinoplasty, we tried to study the outcome of closed approach in our series and to clarify their results.

The endonasal approach is indicated in patients with excess dorsal convexity relative to ideal height and position of the nasion. Normal or slightly increased nasal length and tip projection should be present prior to surgery [11].

Because most of our patients were candidates for reduction rhinoplasty, even mild degree of septal deviation which did not cause nasal block, were considered for septoplasty to avoid postoperative nasal block [13].
In our series, the intercartilagenous approach is used for dorsal deformity or hump.

1- Dorsal humps and lateral profile management:
   a- In bony hump removal, after the bone is removed by an osteotome, rasping is usually needed to smooth the edges. During this step the author found that after personal satisfaction with the dorsal profile, further lowering of the dorsum about 1mm is needed to avoid reformation of a hump, either immediately after lateral osteotomies or later in the ensuing few weeks or months. This agrees with what other authors suggested in hump removal, and the late hump formation is usually the result of periosteal tissue reaction [4].

   b- Regarding the ULC, there is great concern about leaving a mucosal contact with the septum to avoid nasal valve collapse [14]. Some studies advocated partial resection of the ULC to reduce the width of middle third of the nose [15,16]. In our series, in the majority of cases the ULC was separated from the nasal septum with excision of a triangular piece from its lower medial edge while keeping the mucosa intact. The majority of patients did not have nasal block, and in addition it adds the benefit of avoiding the pollybeak deformity which usually results from under resection of the ULC and the septum. Otherwise in patients in whom the middle third was already narrow, such resection was kept to minimum to avoid postoperative nasal valve collapse [17,18].

c- The lateral osteotomy has received attention because of the many challenges this maneuver presents. Tardy and Denney helped popularize the use of micro-osteotome to more precisely perform osteotomies as well as to minimize the damage to both the supportive periostium and the intranasal mucosa [19]. The perforating technique has been noted to provide better preservation of the periosteal attachments laterally [20].

   d- Dorsal grafts were needed in about (11%) of patients, and these grafts were taken from the nasal septal cartilage, or from the excised alar cartilage. Theses grafts were sculptured and suture fixed to the overlying skin.

In an endonasal rhinoplasty approach, a precise pocket is usually created to house the graft. The skilled rhinoplasty surgeon relies on an exact fit and external splinting to prevent graft migration [21-24]. There were very satisfying results with the dorsal graft regarding the cosmetic outcome and the graft viability.

2- Tip modification:
   a- Cephalic excision of the LLC was done by retrograde dissection from the intercartilagenous incision, and thus avoiding another incision in the vestibule. Other procedures to modify the tip are the transcortilagenous and the delivery approaches, and they were not applied. The author found that practicing this approach is an easy and with acceptable results (Fig. 6).

   b- Alar base reduction is an integral part of rhinoplasty, and is considered when the interalar distance exceeds the intercanthal distance. Classically described by Weir, with subsequent modification by Joseph and Aufricht, the modified Weir incision is the technique of choice for excessive flaring of the ala for the frontal appearance of a wide nasal base.

3- The outcome:
   Approximately 10-20% of patients undergoing primary rhinoplasty are dissatisfied with the result of surgery and request revision [4]. Factors predisposing to revision are thin skin, a low radix, the narrow middle vault and reduced tip projection. The most frequent are the pollybeak deformity, irregularities of the nasal dorsum, cartilaginous saddle nose with decreased tip projection and retracted columella [26].

   In our series 16 patients (10%) required revision surgeries for: residual humps in (4.2%), pollybeak deformity in (1.8%), bony deviation in (1.2%), cartilaginous deviation in (1.8%), and saddle nose in (0.6%). In addition the results in 12 patients were not ideal for the author, and those patients might be candidates for revision surgery, yet they did not request it, so making the unacceptable results 17%. Revision surgery improved the outcome in the operated patients.

Traditional endonasal rhinoplasty: Is a classic reductive operation, fraught with a steep learning curve, severe functional repercussions, and difficulty in achieving natural symmetric results. One of the most difficult aspects of endonasal surgery is predicting postoperative tip position and it is contraindicated in patients with an underprojected tip, because this approach disrupts the three major
tip support mechanisms [9,13]. The advantages of the endonasal approach include decreased operative times, rapid recovery, and less significant scar contracture. Profile adjustments are typically easier to judge in an endonasal approach because of having the soft tissue envelope remain undisturbed [7,10,11].

The unobstructed view afforded by open rhinoplasty has decreased the learning curve of surgeons in the most difficult of plastic surgical procedures to achieve commendable results. It provides unparalleled exposure of all parts of the nasal skeleton. It is of particular value in tip surgery and for precise placement of grafts and sutures like shield graft and columellar strut. Revision septrhinoplasty, severe trauma and the cleft lip nasal correction are specific indications [12]. However, open rhinoplasty has the disadvantage of increased operative time, prolonged postoperative swelling, and loss of nasal tip support if compensatory measures are not performed. In addition, open rhinoplasty patients may have more profound scar contracture from complete degloving of the soft tissue of the nose, resulting in asymmetries revealed after long healing periods [27].

In reality, most patients do not seek to undergo major structural changes in their nose. Furthermore, even the most complex nasal deformities can be approached endonasally, with the supplement of grafting and suturing procedures [28-30].

Conclusions:
The endonasal technique provides an excellent alternative to the more radical external approach. The endonasal technique is an adequate method of dealing with even the most complex of cases.

The tips are:
1- In septal surgery, the cartilage may need to be removed and inserted as a free graft to achieve the midline placement of the nasal septum. Before starting rhinoplasty, silastic splints are inserted and suture fixed into the septum, and the anterior edge of the silastic is just behind the site of hemi or transfixion incision. In this way, the septum and its elevated flaps will not interfere with rhinoplasty procedure.

2- In hump removal, if you are satisfied with the level reached, you better try to lower the hump one more millimeter, especially in females to avoid the reformation of a small hump after lateral osteotomies or later in the course of healing.

3- The upper lateral cartilages can be separated from the septum extramucosally, and be cautious in patients with narrow middle vault to avoid possible internal valve collapse.

4- Lateral osteotomies are better done using percutaneous 2mm osteotome to avoid excessive postoperative ecchymosis and edema.

5- Cephalic excision of lower lateral cartilage can be done without the need for another incision, because it can be reached by retrograde dissection from the intercartilagenous incision.

6- Dorsal grafts are easy to manipulate and can be inserted into the proper site with suture fixation into the overlying skin to overcome certain deformities especially supratip saddle.

7- The sutures of alar base excision are better removed several days after splint removal to avoid wound breakdown during nasal manipulation.

8- Pre and postoperative photographs are better given to the patient in form of CD, so the patient makes his own judgments regarding the outcome of surgery.

Acknowledgments:
There is no conflict of interest regarding the manuscript, no financial relationships with any organization.

REFERENCES


