Results of Primary Open Structure Rhinoplasty

Objectives: To share our experience with open structure rhinoplasty and to evaluate its aesthetic results subjectively as well as objectively

Study design: Quasi experimental study

Place and duration of study: This study was conducted at Department of Otorhinolaryngology and Head & Neck Surgery, Islamic International Medical College Trust Hospital, Rawalpindi from October 2007 to October 2009.

Materials and Methods: A total of 31 patients underwent open structure rhinoplasty with or without septoplasty under general anesthesia. Patients were followed up for a minimum period of 8 months. Cosmetic results of rhinoplasty were evaluated subjectively and objectively both by the patient and the surgeon considering pre and postoperative standard photographs. Cosmetics results were categorized as appreciably good, fair or worse according to the surgeon’s evaluation and patient’s point of view.

Results: Out of 31 patients, 23 (74%) were male and 8 (26%) were female. The age range was 14 to 45 years. Open structure rhinoplasty combined with septoplasty was performed in 21 (68%) patients whereas 10 (32%) patients had only rhinoplasty. Autologous cartilage grafts were used in 22 (71%) patients. Among them nasal septal cartilage was the commonest donor site used in 19 (86.3%) patients. The postoperative period was uneventful, painless and without postoperative bleeding in all the patients. Cosmetic results were shown to be appreciable good in 24 (77.4%) patients by objective evaluation and in 20 (64.5%) by subjective evaluation. Improvement in nasal airway after septorhinoplasty was noted in 17 (81%) patients.

Conclusion: Open structure rhinoplasty provides excellent exposure of osteocartilagenous nasal framework providing the opportunity to perform wide variety of modern rhinoplasty techniques resulting in superb aesthetic results both subjectively as well as objectively.

Key words: Rhinoplasty, open approach, Aesthetic surgery

Introduction

Open structure rhinoplasty was popularized by Goodman and Charles in the 1970s when they introduced the modified transcolumellar incision, make which excellent exposure of nasal osteocartilagenous framework was made possible.1 This approach has becomes increasingly popular during the last decade and now considered a firmly established and important technique in rhinoplasty surgery.2

Open structure rhinoplasty has numerous advantages. It provides an unobstructed view of nasal cartilaginous and bony framework thus enhancing the ability to access and manage structural deformities by direct inspection. This aspect is especially beneficial in teaching rhinoplasty to the junior surgeons, which is considered to be one of the most difficult of plastic surgical procedure. However, open rhinoplasty has some disadvantages especially increased operative time, more profound scar contracture, prolonged postoperative swelling, visibility of columellar scar and loss of nasal tip support if compensatory measures are not adopted during the procedure.3

The purpose of the present study is to share our experience with this technique and to access the aesthetic results of it from both surgeon’s and patient’s point of view.

Materials and Methods

This study was conducted at the Department of Otolaryngology and Head & Neck Surgery of Islamic International Medical College Trust Hospital, Rawalpindi.
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over a period of two years i.e. from October 2007 to October 2009. All those patients who presented to outpatient clinics of our department with complaints of nasal deformity with or without nasal obstruction were included in the study. We excluded the patients less than 14 years of age from our study as well as those patients who had previous rhinoplasty or those in which nasal deformity was persisted after cleft lip or palate surgery. All patients were evaluated with detailed history, clinical examination and standard preoperative photographs. These findings were recorded in special preoperative proforma in each case. Open structure rhinoplasty with or without septoplasty was done under general anesthesia in all the cases. All patients were given intraoperative dose of steroids (8mg Dexamethasone IV) at the start of operation and repeated 24 hours after the operation. Postoperatively nasal packs were removed after 24hrs. All patients were prescribed antibiotics and analgesics for five days on discharge. Patients were evaluated in outpatient clinic on 7th postoperative day. They were again evaluated after one, three and eight months after the operation and standard photographs taken. Results were evaluated as regards the aesthetic outcome, change in nasal airway and any complications. Cosmetic results of rhinoplasty were evaluated subjectively and objectively. Evaluation of aesthetic outcome is based on comparison of four standard pre and postoperative photographic views. These were frontal, lateral, oblique and basal views. Each postoperative view was compared with corresponding preoperative view by the two primary surgeons independently and results were categorized as appreciably good, fair or worse. Subjective evaluation of cosmetic results was based on patient’s assessment i.e., how he/she perceive the final aesthetic outcome of operation and categorized separately as good, fair or worse.

Results

A total of 31 patients were included in this study. Among them 23 (74%) were male and 8 (26%) were female. The male to female ratio was 2.8:1. The patients ranged in age from 14 to 45 years with mean age of 19.58 years. Majority (68%) were between the ages of 16 and 20 years.

The indication of rhinoplasty was nasal deformity along with nasal obstruction in 21 (68%) patients whereas 10 (32%) patients requested the operation due to cosmetic reasons only. The duration of nasal deformity was between 6 months to 13 years with average duration of 7.35 years. The etiology of nasal deformity in these patients is shown in Table I.

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Number of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital/Developmental</td>
<td>16</td>
<td>51.6 %</td>
</tr>
<tr>
<td>Trauma</td>
<td>12</td>
<td>38.7 %</td>
</tr>
<tr>
<td>Previous septal surgery</td>
<td>2</td>
<td>6.45 %</td>
</tr>
<tr>
<td>Infection</td>
<td>1</td>
<td>3.22 %</td>
</tr>
<tr>
<td>TOTAL</td>
<td>31</td>
<td>100 %</td>
</tr>
</tbody>
</table>

Analysis of types of nasal deformity (Figure I & II) showed that majority (42%) of the patients had nasal tip deformity along with deviated bridge. Evaluation of nasal tip deformities revealed that 8 (25.8%) patients had under projected tips, 1 (3.2%) had over projected, 4 (13%) had deviated and in 2 (6.4%) patients, nasal tips were bulbous.

![Figure I: Types of Nasal Deformity in patients](image)

![Figure II: Pre and postoperative views of patients with various types of nasal deformities](image)
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Open structure rhinoplasty combined with septoplasty was performed in 21 (68%) patients whereas 10 (32%) patients underwent rhinoplasty. Autologous cartilage grafts were used in 22 (71%) patients. Among them nasal septal cartilage were the commonest donor site used in 19 (86.3%) patients followed by auricular cartilage in 2 (9%) and costal cartilage in only 1 (4.5%) patient. Figure III shows how these cartilage grafts were used to correct various deformities. Medial and lateral osteotomies were required in 22 (71%) patients.

![Image](Saddle Nose (Lateral View))

![Image](Hump Nose (Lateral View))

Figure III: Types of Cartilage Grafts Used

Table II: Cosmetic Evaluation of Results

<table>
<thead>
<tr>
<th></th>
<th>Appreciably Good</th>
<th>Fair</th>
<th>Worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgeon’s Evaluation</td>
<td>24(77.4%)</td>
<td>7(22.6%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td>Patient’s Evaluation</td>
<td>20(64.5%)</td>
<td>10(33.3%)</td>
<td>1(3.2%)</td>
</tr>
</tbody>
</table>

Table III: Improvement in Nasal Airway

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Number of Patients</th>
<th>Better</th>
<th>Same</th>
<th>Worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhinoplasty with Septoplasty</td>
<td>21</td>
<td>17</td>
<td>4</td>
<td>0(0%)</td>
</tr>
<tr>
<td>Rhinoplasty only</td>
<td>10</td>
<td>2</td>
<td>7</td>
<td>1(10%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>31</td>
<td>19</td>
<td>11</td>
<td>1(3.2%)</td>
</tr>
</tbody>
</table>

Discussion

Open structure rhinoplasty is a well established technique in rhinoplasty surgery as it provides excellent exposure allowing direct inspection, diagnosis and management of various deformities of nasal framework. Numerous publications have appeared in international medical literature utilizing this technique in various ethnic populations especially in the last decade.4-7 In spite of world wide popularity of this technique among rhinoplasty surgeons, we could not find any original or review article/report in Pakistani medical journals on open structure rhinoplasty and its results in Pakistani population when searched on Pakmedinet.

The demographic analysis of our study population showed that majority of our patients were males (74%) and most of them were (68%) between the ages of 16 and 20 years. This might be due to the fact that concerns regarding cosmetic appearance of face are more pronounced in this age group. In adolescent population, there is complex interplay of psychological, social and physiological factors that should be given due importance to avoid conflicts over the postoperative aesthetic results of rhinoplasty.8 Due to our specific cultural and socioeconomic setup, females especially those belonging to lower and middle class, have lesser opportunities of healthcare. This aspect is more pronounced when it involves undergoing a surgical procedure.

The postoperative period was uneventful. Average follow up duration was 10.5 months (range was 8 months to 17 months). At the end of eight months of follow up, cosmetic evaluation of the outcome was done both by the surgeon and the patient (Table II) and were shown to be appreciable good in 24 (77.4%) patients by objective evaluation and in 20 (64.5%) by subjective evaluation. Improvement in nasal airway after septorhinoplasty was noted in 17(81%) patients (Table III).
procedure solely for cosmetic reasons. This feature is reflected in our study as only 26% of our patients were female.

We did not offer open rhinoplasty to patients less than 14 years of age due to the concerns that septorhinoplasty at a younger age carries the risk of growth disturbances of nose and premaxilla. Majority (68%) of our patients presented with complaints of not only cosmetic deformity of nose but also of nasal obstruction requiring septorhinoplasty. This feature was also observed in other studies. The nasal septum plays a pivotal role in normal growth of external nasal osteocartilagenous framework, as summarized in the age old dictum "as the septum goes, so goes the nose". Therefore recognition and correction of septal abnormalities is the basic principle in the correction of deviated or twisted nose.

Various factors are considered to be the cause of external nasal deformity. They include trauma, congenital or developmental factors, previous septal surgery, septal infections and various granulomatous diseases. Saeed M and Mian FA, in a study conducted on thirty patients undergoing augmentation rhinoplasty, found trauma to be the commonest etiological factor responsible for saddle deformity of nose in 67% of patients. Although nasal trauma is considered to be the commonest predisposing factor for deviated nose, we observed that in almost half (51.6%) of our patients, congenital or developmental factors were found to be the commonest etiological factor followed by trauma. A possible reason for this difference might be the fact that most of the childhood nasal trauma, which usually occurs during play or due to falls, are either not recognized or forgotten.

Tip deformity and deviated nose was the commonest feature noted in 42% of our patients undergoing open rhinoplasty. This finding is also shared by other studies.

Recent trends shows increase in the use of autogenous cartilage grafts in primary rhinoplasty ranging from 40% to 100% especially in Asian patients who require dorsal augmentation in majority of cases. We used autologous cartilage grafts in majority (71%) of our patients. These grafts are superior to other autografts in number of ways. They are easy to obtain and carve and do not resorb unless the procedure is complicated by infection. They can be positioned in precise pockets for contouring and give a more natural ‘feet’. Among the autologous cartilage donor sites, nasal septum was the commonest site used in 86.3% of our patients followed by auricular cartilage. Neither of these donor sites is associated with significant morbidity. Nasal septum is the cartilage graft donor site of choice, because it is available in the same operative field. This view is shared by another study in which authors utilized nasal septal cartilage graft as the commonest autograft while doing primary open rhinoplasty in non-Caucasian patients. In saddle deformity of nose, nasal septal cartilage is usually absorbed or not available in sufficient amount. In these cases alternative autologous cartilage donor sites are conchal cartilage or costal cartilage. We utilized these graft in two cases of saddle deformity in our series.

Autologous cartilage grafts are utilized in various ways to correct deformities of tip, dorsum and columella. In our series, we mostly utilized autologous cartilage (in 52% of our patients) in the form of columellar strut and tip graft. This trend is seen in many other studies done on Asian population. In open structure rhinoplasty, it is essential to reconstruct or augment the tip support mechanisms. The placement of columellar strut gives increase strength in the projection of nose. Tip graft provide projection and contour to the nasal tip. Together, the two above mentioned grafts play an important role in maintaining tip support mechanism.

Deviated nose was the second commonest (74%) nasal deformity in our series of patients. Medial and lateral osteotomies were required to mobilize the bony pyramid for infracture, out fracture or realignment in 71% of our patients. Osteotomies are associated with postoperative edema and ecchymosis but we did not notice these complications in our patients. This may be due to the fact that we routinely gave intra and postoperative steroids in our rhinoplasty patients. We found supportive evidence for this practice in literature.

Open structure rhinoplasty is a challenging procedure and complications can arise due to inappropriate patient selection, inadequate diagnosis, errors in surgical technique, and variations in patient’s anatomy or healing response. We did not encounter any significant complications like extrusion or absorption of graft, postoperative infection, bleeding, ecchymosis, edema or pain. This may be due to our practice of using autologous cartilage grafts, meticulous surgical technique, keeping nasal packs for 24hrs, using intra and postoperative steroids and routinely prescribing antibiotics and analgesics in the post operative period.

Assessing cosmetic outcome of rhinoplasty is a complex issue involving many factors and different standards of aesthetic values. Aesthetic results of rhinoplasty are usually judged by the surgeon who evaluates the results according to his aesthetic standards. Very few examples are available in literature where cosmetic outcome of rhinoplasty was evaluated from the patient’s perspective. In the present study we evaluated cosmetic results for rhinoplasty taking into consideration both surgeon’s and patient’s point of view. Our results were categorized as appreciably good in 77.4% of cases according to surgeon’s evaluation standards and 64.5% according to patient’s point of view. None of the case had been labeled as worse.
Results of Primary Open Structure Rhinoplasty according to the surgeon evaluation whereas only one case (3.2%) was considered worse on patient’s evaluation. We evaluated the results at the end of 8 months of follow up although long term follow up is required to judge cosmetic results of rhinoplasty. Open structure rhinoplasty provides wide exposure to nasal framework and any deformity of nasal septum can be corrected at the same time resulting in improvement of nasal airway and appearance simultaneously. Improvement in nasal airway was noticed in 81% of our patients who presented with complaints of external nasal deformity and nasal obstruction. In all these cases rhinoplasty was combined with septoplasty as a single stage procedure. Other studies in which septoplasty were combined with rhinoplasty produced similar improvement in nasal airway and good aesthetic results.20,21

Conclusion

Open structure rhinoplasty approach provides excellent exposure of nasal osteocartilagenous framework thus providing direct inspection and management of any structural deformity. Due to wide exposure, a wide variety of rhinoplastic techniques can be performed and deformities corrected resulting in superior aesthetic outcome both subjectively as well as objectively.

References