Presenting Concerns and Surgical Management of Secondary Rhinoplasty

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Abstract
Background: Secondary rhinoplasty is a challenging surgical procedure, and patients seeking this procedure tend to be difficult to please. However, psychological and functional improvements in patients and high satisfaction rates are achievable with secondary rhinoplasty.
Objectives: The authors reviewed a series of secondary rhinoplasties and tabulated patient concerns, underlying deformities, and corrective surgical procedures.
Methods: The authors conducted a retrospective review of 109 patients for whom the senior author (B.M.) performed secondary rhinoplasty from 2009 to 2012. Concerns causing the patients to seek surgery and management of the secondary procedures were described.
Results: The mean patient age at time of surgery was 33.2 years (range, 18-61 years), and most patients (71.6%) were women. The mean number of previous procedures was 1.6 (range, 1-8). Chief presenting concerns were asymmetry (36.7%), large tip (24.8%), and breathing difficulties (22.0%). The most common clinical findings were nostril asymmetry (33.9%), septal deviation (32.1%), overresection (26.6%), and tip asymmetry (26.6%).
Conclusions: Patients seeking secondary rhinoplasty present with various concerns. Preoperative identification of the underlying problems and determination of the techniques required to correct them are important to successful secondary procedures.

Level of Evidence: 4

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Rhinoplasty is becoming more popular in the United Kingdom. According to the British Association of Aesthetic Plastic Surgeons, primary rhinoplasties increased by 168.6% from 2004 to 2011. With the spike in primary rhinoplasties, a concomitant increase in secondary procedures is expected.

Secondary rhinoplasty has long been considered a challenging procedure, and patient seeking this operation tend to be difficult to please. Nevertheless, authors have noted improvements in psychological and functional outcomes and high satisfaction rates among patients after secondary surgery.2,3

Numerous authors have explored the motives and concerns of patients seeking secondary rhinoplasty.3,4 In a retrospective study of 100 secondary rhinoplasty patients, Constantian4 found that the most common reasons for revisional surgery were correction of a new deformity after primary rhinoplasty and failure to correct the original deformity. In a prospective study, Daniel4 determined 5 primary reasons motivating Middle Eastern women to seek secondary rhinoplasty: (1) to achieve a smaller, more refined nose with a slight dorsal curve and a more defined tip, despite the achievement of an acceptable, natural-appearing result; (2) for correction of a deformity that was insufficiently corrected during the primary operation; (3) to eliminate visible stigmata of rhinoplasty; (4) to address major secondary deformities (ie, a persistent primary abnormality and surgical stigmata plus functional limitations); and (5) for aesthetic reconstruction after multiple aggressive procedures.

Secondary procedures may be necessary when surgeons fail to perform essential maneuvers or overlook key techniques.

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during the primary operation. Successful secondary rhinoplasty requires familiarity with commonly reported concerns after primary rhinoplasty as well as the identification and correction of underlying problems.

In this study, we reviewed secondary and revisional rhinoplasties performed by the senior author. We report our results in terms of “secondary rhinoplasty,” defined as rhinoplasty performed by the senior author after previous rhinoplasty by a different surgeon, or “revisional rhinoplasty,” defined as rhinoplasty in which the senior author performed the primary and secondary operations. The present study addresses presenting concerns of patients, their underlying nasal deformities, and the surgical maneuvers performed to correct them.

METHODS

The authors conducted a retrospective review of consecutive patients who underwent secondary or revisional rhinoplasty performed by the senior author (B.M.) in the United Kingdom from January 2009 to December 2011. Medical records were evaluated for demographic information, the number and timing of previous procedures, chief concerns of patients, and underlying deformities assessed by the senior author. Surgical records were reviewed, and the maneuvers performed to correct nasal deformities were noted.

RESULTS

During the study period, 100 patients (91.7%) underwent secondary rhinoplasty, and 9 patients (8.3%) underwent revisional rhinoplasty performed by the senior author. The mean age of the patients at time of surgery was 33.2 years (range, 18-61 years), and 78 of 109 patients (71.6%) were women. The mean number of previous procedures was 1.6 (range, 1-8; Figure 1), and the mean interval between the previous procedure and the secondary or revisional rhinoplasty was 4.4 years (range, 6 months to 20 years). All patients were monitored for at least 12 months postoperatively.

Presenting Concerns and Clinical Findings

The most common presenting concerns among the 109 study patients were asymmetry (36.7%), large tip (24.8%), and breathing difficulties (22.0%; Table 1). The most common clinical findings were nostril asymmetry (33.9%), septal deviation (32.1%), overresection (26.6%), and tip asymmetry (26.6%; Table 2). The subset of 9 patients who underwent revisional rhinoplasty included 4 patients who presented with tip asymmetries, 3 with residual dorsal humps, 1 with dorsal irregularities, 1 with alar retraction, and 1 with unsatisfactory scarring.

Surgical Maneuvers

Of 109 patients, 95 (87.2%) underwent open rhinoplasty, and 14 patients (12.8%) were treated by the closed approach. The subset of 9 patients who underwent revisional rhinoplasty included 6 who were treated by open rhinoplasty and 3 who underwent closed rhinoplasty.

Table 1. Presenting Concerns of Patients Undergoing Secondary or Revisional Rhinoplasty (N = 109)

<table>
<thead>
<tr>
<th>Presenting Concern</th>
<th>No. (%) of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymmetry</td>
<td>40 (36.7)</td>
</tr>
<tr>
<td>Tip too big</td>
<td>27 (24.8)</td>
</tr>
<tr>
<td>Difficulty breathing</td>
<td>24 (22.0)</td>
</tr>
<tr>
<td>Overdone or scooped nose</td>
<td>23 (21.1)</td>
</tr>
<tr>
<td>Droopy tip</td>
<td>23 (21.1)</td>
</tr>
<tr>
<td>Hump</td>
<td>13 (11.9)</td>
</tr>
<tr>
<td>Crooked nose</td>
<td>11 (10.1)</td>
</tr>
<tr>
<td>Tip too high</td>
<td>11 (10.1)</td>
</tr>
<tr>
<td>Irregularities</td>
<td>10 (9.2)</td>
</tr>
<tr>
<td>Nose too wide</td>
<td>10 (9.2)</td>
</tr>
<tr>
<td>Nostrils arched</td>
<td>9 (8.3)</td>
</tr>
<tr>
<td>Pinched tip</td>
<td>9 (8.3)</td>
</tr>
<tr>
<td>Nose too short</td>
<td>9 (8.3)</td>
</tr>
<tr>
<td>Nose too long</td>
<td>7 (6.4)</td>
</tr>
<tr>
<td>Nose too big</td>
<td>6 (5.5)</td>
</tr>
<tr>
<td>Nose too narrow</td>
<td>6 (5.5)</td>
</tr>
<tr>
<td>Scar</td>
<td>5 (4.6)</td>
</tr>
</tbody>
</table>

*Many patients presented with >1 concern.
rhinoplasty and 3 who underwent the closed approach. Septal cartilage was harvested from 87 of 109 patients (79.8%). Conchal cartilage was harvested from 41 patients (37.6%). Of these, 14 (34.1%) had insufficient septal cartilage remaining from the previous procedure. Rib cartilage was required in 3 of 109 patients (2.8%). Harvested cartilage grafts were utilized for a variety of purposes (Table 3).

Spread grafts were placed most frequently in patients undergoing secondary or revisional rhinoplasty (67 of 109 patients [61.5%]), followed by columellar struts (64 patients [58.7%]) and tip grafts (57 patients [52.3%]). Temporal fascia was harvested in 14 of 109 patients (12.8%) for dorsal augmentation and correction of irregularities. Diced cartilage wrapped in temporal fascia was applied for dorsal augmentation in 4 patients (3.7%). No patients received alloplastic implants.

Nostril asymmetry was noted in 37 of 109 patients (33.9%), and alar base resection was performed in approximately half of these patients. Thirty patients in our series (27.5%) required lateral osteotomies, whereas only 4 patients (3.7%) required medial osteotomies. In 48 patients (44.0%), suture techniques were performed to address issues with the nasal tip.

### DISCUSSION

The results of the present study highlight the nasal concerns leading to clinical presentation for secondary or revisional rhinoplasty and the surgical management of nasal deformities in a series of 109 patients. Our personal revision rate was 8.3%, that is 9 patients underwent subsequent surgery when the prior procedure was performed by the senior author. According to a survey of rhinoplasty surgeons in the United States, 58% had revisional rates < 5%, whereas 33% had rates from 6% to 10%.6 Guyuron and Bokhari5 suggested that low revisional rates may be attributable to open rhinoplasty, which enables better visualization. In our practice, the preferred method of primary or revisional rhinoplasty is using an open approach although a small number of cases would have a closed procedure.

Patients seeking secondary or revisional rhinoplasty present with a spectrum of aesthetic and/or functional concerns. In our series, 24 of 109 patients (22.0%) presented with some loss of function after their previous rhinoplasty. Other authors have reported variable rates of functional problems, from 15% to 68%, in patients who seek secondary rhinoplasty after 1 or more previous procedures.2,7-10 In their series of 47 patients who presented for revisional rhinoplasty, Hellings and Trenite2 determined that 26 patients (55%) presented with aesthetic concerns, 7 patients (15%) with functional concerns, and 14 patients (30%) with a combination of aesthetic and functional concerns. In a study of 100 patients who underwent secondary rhinoplasty, Lee et al7 found that 65% presented with some airflow obstruction.

Indications for secondary rhinoplasty vary by patient ethnicity, with Asian populations experiencing more alloplastic
Chauhan et al. found the crooked nose to be the most common presenting concern in their series (33 patients [32%]). In their review of 92 patients who underwent secondary rhinoplasty over a 9-year period, Won and Jin found that 33 patients (63.4%) experienced alloplastic implant-related problems, such as displacement, extrusion, or infection. In the present study, 1 patient (0.9%) underwent secondary surgery because of implant-related problems.

The most common presenting concern in our series was asymmetry (40 of 109 patients [36.7%]), similar to the findings of other series. In a retrospective review of 100 secondary rhinoplasty patients, Lee et al. noted significant asymmetries of the dorsum, nostrils, and alar base in 65%, 41%, and 27% of their patients, respectively. In the present study, 37 of 109 patients (33.9%) had some degree of nostril asymmetry on clinical examination. Alar base resection was performed in approximately half of these 37 patients (18 patients, 48.6%). In our experience, many surgeons are reluctant to undertake alar base resection during primary rhinoplasty. This may be due to inexperience of the surgeon or failure to recognise the need for alar base resection. The creation of additional scars can also deter some from committing to this. We have found that patients benefit from this and concerns about additional scars are not reported by patients postoperatively. In their series of 104 patients who underwent secondary rhinoplasty, Yu et al. found tip asymmetries to be the most frequent presenting concern, followed by a crooked middle third of the nose (33 patients [32%]). In their review of 92 patients who underwent secondary rhinoplasty over a 9-year period, Chauhan et al. found the crooked nose to be the most common presenting concern (35 patients [38.0%]). In our series, the crooked nose was a concern for a smaller proportion of patients (11 of 109 patients [10.1%]).

**Case Studies**

Numerous secondary deformities can occur after rhinoplasty. In the following sections, we present specific deformities and describe how they were addressed in representative patients from our series.

**Inverted V Deformity**

The inverted V deformity is common after dorsal hump reduction and may result from inadequate postoperative support of the upper lateral cartilages and their medial collapse or from inadequate medialization of the nasal bones. This deformity was found in 24 of 109 (22.0%) patients in the present study (Table 2). In a prospective study of 50 patients presenting for rhinoplasty after ≥2 previous rhinoplasty procedures, Foda noted open-root and inverted V deformities in up to 42% of patients. Rohrich et al. reported a technique for component dorsal hump reduction that avoids functional and aesthetic problems such as the inverted V deformity in patients undergoing primary rhinoplasty. Of 24 patients in our series who presented with the inverted V deformity, spreader grafts were placed in 20 patients (83.3%), and 10 (41.7%) underwent lateral osteotomies.

**Pollybeak Deformity**

A pollybeak deformity occurs when the area of the supratip break projects beyond the nasal tip, giving the appearance of a bulbous, ptotic tip (Figure 2). This defect can result from inadequate resection of the lower dorsal septum and upper lateral cartilages or from overresection of supratip structures with subsequent formation of scar tissue that creates dead space. This supratip deformity can be avoided by maintaining an appropriate relationship between the dorsal height and septal angle. Inadequate tip projection may be improved with columellar struts or tip grafts. If the caudal dorsum is overprojected, resection of the excessive cartilage may be required. In either case, corrective surgery should not be performed until 1 year after the initial operation. In our series, 93.3% of the 17 patients with a pollybeak deformity received columellar struts, and 80.0% required tip grafts and suture techniques. Therefore, inadequate tip support during the primary procedure was the main cause of pollybeak deformity in our patient series.

**Case of pollybeak deformity.** A 29-year-old woman sought secondary rhinoplasty 7 years after her primary procedure for correction of an overreduced nose with a full, upturned tip. Examination revealed overresection of the dorsum with an inverted V deformity and supratip fullness with overprojection of the nasal tip. The patient also had a hanging columella and retracted left alar margin (Figure 2A, C,E). Open rhinoplasty revealed extensive scarring at the dorsum. Septal cartilage was harvested for spreader grafts and for dorsal augmentation in conjunction with temporal fascia. The remaining septal cartilage was placed as a columellar strut to correct asymmetry of the medial crura. Interdomal sutures were placed, and the length of the nose was restored by means of conchal cartilage as a cap graft for the tip. The remaining conchal cartilage was grafted to the left lateral alar rim. Overprojection was corrected by shaving the caudal excess of the medial crus and subsequently releasing the lateral crus from the accessory cartilage. The hanging columella was addressed by reducing the membranous septum. At 15 months postoperatively, correction of the inverted V deformity, reduction of the pollybeak deformity, and less columellar show were noted (Figure 2B,D,F).

**Overresected Nose**

Of 109 patients in our study, 29 (26.6%) presented with overresection of the dorsum owing to aggressive hump reduction during previous procedure(s). Component hump reduction techniques may help avoid this deformity during
primary rhinoplasty. Of 29 patients who presented with overresected dorsa, 20 (69%) received dorsal cartilage grafts. For dorsal augmentation, temporal fascia grafts were placed in 12 of 29 patients (41.4%), and diced cartilage was utilized in 3 patients (10.3%).

Case of overresected nose. A 30-year-old woman presented with an overdone, upturned nose and nostril asymmetry approximately 2 years after primary rhinoplasty. She did not report any problems with breathing. Analysis revealed an asymmetric and overresected dorsum and a prominent nasal tip that tilted to the right (Supplemental Figure S1A, C,E; supplemental figures are available online at www.aestheticsurgeryjournal.com). Nostril asymmetry with a smaller right nostril was noted on basal view. Open rhinoplasty was performed through the existing columellar scar. Overresection and irregularity of the dorsum were noted during the operation. The medial crura had been sutured together, and there was no columellar strut. Extensive scarring was observed in the nasal tip. The septum was harvested along with cartilage from both ears, and a spreader graft was used to support the left middle third of the nose. To address the dorsum, a 3-layer stack of cartilage was sutured together and covered with a temporal fascia graft to conceal potential irregularities that could be visible under the patient’s thin skin. A columellar strut was inserted to support the medial crura. Alar base resections were performed bilaterally to address the nostril asymmetries, and a graft was placed at the right alar rim for additional support. At 16 months postoperatively, improved symmetry of the nose along the dorsum and tip, correction of the dorsal overresection, and improved symmetry of the nostrils were noted (Supplemental Figure S1B,D,F).
Of 109 patients, 23 (21.1%) presented with a droopy tip, and 20 patients (18.3%) had inadequate tip projection on clinical examination (Supplemental Figure S2). Constantian reported inadequate tip projection in 120 of 150 (80%) secondary rhinoplasty patients and in 15 of 49 (31%) primary rhinoplasty patients. Constantian suggests that many surgeons fail to recognize the underprojected tip, which results from a short middle crus. Tip grafts can increase tip projection, and columellar struts can be placed to maintain tip projection. Columellar struts (70.0%) and tip grafts (70.0%) were used in most patients with a tip of inadequate projection.

**Case of Tip of Inadequate Projection.** A 26-year-old woman presented 18 months after primary rhinoplasty with a long nose, narrow tip, and widened area above the tip. She also noted an inverted V deformity in the middle third of her nose. Clinical analysis confirmed the inverted V deformity and identified a residual dorsal hump, an underprojected and droopy tip, and nostril asymmetry with alar retraction and excessive columellar show (Supplemental Figure S2A,C,E). Open rhinoplasty was performed, and the inverted V deformity was corrected by means of bilateral low-to-high lateral osteotomies and spreader grafts. The anterior caudal septum was reduced to allow rotation, and the 2 domes were sutured together. A columellar strut was placed to support the tip, and additional tip correction was achieved by means of multiple tip grafts. The lateral crura were found to be concave and were supported with cartilage, which was directed caudally to support retraction of the alar rim. Bilateral

![Figure 3](https://academic.oup.com/asj/article-abstract/35/2/137/180103)
alar base resections were performed to address the nostrils. At 12 months postoperatively, clinical examination indicated correction of the inverted V deformity, improved tip projection, less alar retraction, and decreased columellar show (Supplemental Figure S2B,D,F).

**Overshortened Nose**

The overshortened nose, which results from excessive resection of the caudal septum (Figure 3), can be corrected by a variety of methods depending on the length required. In our study of 109 patients, 11 (10.1%) presented with an overshortened nose; 6 of these patients required substantial lengthening with septal extension grafts. Minor lengthening and downward tip rotation was required in 2 of these patients and was achieved by release of the lower lateral cartilage from the upper lateral cartilage.

*Case of overshortened nose.* A 24-year-old woman who had undergone a primary rhinoplasty 4 years previously expressed unhappiness with her upturned and shortened nose. Clinical analysis revealed an excessively overprojected nose with a supratip depression. The alar bases were asymmetric, with the right positioned lower than the left (Figure 3A,C,E). Several potential explanations exist for this deformity, including overresection of the dorsum, the formation of scar tissue between the upper and lower lateral cartilages, excessive mucosal reduction, or the placement of sutures incorrectly between the columella and septum. During open secondary rhinoplasty, the 2 domes were found to be sutured tightly to each other and to the septum, which was functioning as a strut. Release of the sutures allowed deprojection of the tip by 4 mm. The posterior caudal end of the septum was reduced to narrow the angle between the columella and the upper lip. The adhesions between the upper and lower lateral cartilages were released to further lengthen the nose, and conchal cartilage was placed as a spacer between the upper and lower lateral cartilages. Additional cartilage was harvested from the septum and placed as a columellar strut. The 2 domes were joined with transdomal and interdomal sutures, and the remaining conchal cartilage was utilized as a shield graft. A temporal fascia graft was harvested for the septum to improve contour and camouflage irregularities that might be visible under the patient’s thin skin. At 12 months after surgery (Figure 3B,D,F), clinical examination confirmed deprojection of the nose (potentially excessive deprojection for a female nose) and improved symmetry of the alar bases and the nose overall.

**Study Limitations**

As a retrospective case review, this study was inherently limited by recording bias. Because many international patients were included in this study, it was difficult to obtain records of prior operations and maintain long-term follow-up. A total of 22 patients (20%) had their primary surgery abroad. Therefore, a discussion of techniques that were inadequately performed or omitted during the patients’ primary operations is beyond the scope of this study.

**CONCLUSIONS**

Secondary rhinoplasty patients present with concerns ranging from minor asymmetry to major overresection and nasal collapse. Many of these patients have undergone numerous previous operations and have sought consultations from multiple surgeons. These patients may have very high expectations regarding surgical correction of their concerns.

The surgeons who performed primary rhinoplasty in these patients may be relatively inexperienced and may not recognize the importance of specific nasal structures. In our experience, the middle third of the nose is underappreciated, especially during dorsal reduction with a closed approach. Many surgeons overcorrect the dorsum and neglect spreader grafts or flaps. Surgeons also may neglect to perform adequate osteotomies to prevent the inverted V deformity. Full support of the nasal tip may be overlooked, as evidenced by the lack of columellar strut placement in primary procedures and the prevalence of pollybeak deformities and underprojected tips. Reluctance to harvest cartilage for support grafts also is apparent.

Surgeons performing secondary rhinoplasty should be aware of problems commonly seen after primary procedures and should have the technical skills to address them. The multiply operated nose remains a very different entity from the virgin nose. Despite the expertise and knowledge associated with secondary rhinoplasty, healing remains a variable beyond our control. Hence, some rate of revisional surgery should be expected, even among the most experienced surgeons.

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**REFERENCES**


