Cosmetic Rhinoplasty: Revision Rates Revisited

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Abstract

Background: Cosmetic rhinoplasty has great potential to change a patient’s appearance. It also carries the very real risk of patient dissatisfaction and request for revision. Although there have been many published patient series studying various aspects of rhinoplasty, questions remain regarding revision rates, as well as risk factors for complications, dissatisfaction, and revision.

Objectives: The authors investigate the rate of cosmetic rhinoplasty revision at a plastic surgery group practice and identify risk factors for revision.

Methods: Medical records were retrospectively reviewed for all patients who presented to a single multisurgeon practice for primary rhinoplasty, septrhinoplasty, and revision rhinoplasty between 1998 and 2008. Patient demographics, preoperative complaints, preoperative physical examination findings, detailed operative data, and postoperative outcomes were abstracted from the charts. Complication rates, revision rates, and postoperative patient satisfaction were calculated and analyzed for identifiable risk factors.

Results: Of 369 consecutive cosmetic rhinoplasties performed during the study period, 279 (72.7%) were conducted with an open approach. The overall complication, dissatisfaction, and revision rates were 7.9%, 15.4%, and 9.8%, respectively. Postoperatively, most patients (87%) were identified by their surgeons as having had successful anatomical correction of their nasal deformity. History of previous nasal operation or facial fracture, lack of anatomical correction, and occurrence of postoperative complications were associated with both revision and dissatisfaction (P < .05). Failure to address the nasal tip at the time of primary rhinoplasty was associated with a higher level of dissatisfaction.

Conclusions: Cosmetic rhinoplasty is one of the most challenging procedures in plastic surgery; however, these data indicate that a high level of patient satisfaction is attainable within a plastic surgery group practice if certain factors are considered. Specifically, surgeons should be aware of risk factors that are potentially associated with dissatisfaction and revision.

Level of Evidence: 4

Keywords

rhinoplasty, nose, nasal tip, revision rate

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Cosmetic rhinoplasty is one of the most challenging, yet rewarding, procedures performed in plastic surgery. It carries tremendous potential for contouring, improving harmony, and improving the proportions of a patient’s facial aesthetics. However, as with any cosmetic surgical procedure, complications, dissatisfaction, and the need for revisions are inevitable. Despite these risks, rhinoplasty remains a commonly performed procedure for both cosmetic and reconstructive purposes.

Currently, there is a lack of consensus with respect to acceptable revision, complication, and dissatisfaction rates following rhinoplasty. Published revision rates range...
from 5% for tip rhinoplasty to 15.5% for large series of secondary rhinoplasties,\textsuperscript{1-6} whereas complication rates range from 5% to 18.6% and dissatisfaction rates from 5% to 16% in the literature.\textsuperscript{3,7-9} Moreover, interpretation of currently published literature is difficult given the researchers’ propensity to focus on particular techniques or types of rhinoplasties.\textsuperscript{2,4,5,7} Large series reviewing outcomes across a variety of techniques and approaches are lacking.

The SIMON risk factors (single, immature, male, overexpectant, and narcissistic) and their correlation to the higher revision rates experienced in male patients are fairly well known.\textsuperscript{10} However, as women represent the majority of rhinoplasty patients, risk factors that apply across the entire patient population remain largely undefined. The identification of clinically applicable risk factors for complications, dissatisfaction, and revisions may aid in patient evaluation, preoperative counseling, and operative planning.

In addition, as much of the previously published data have been generated by rhinoplastic specialists and experts, a private group practice engaged in the entire spectrum of plastic surgery offers a unique perspective regarding achievable rhinoplasty results. It was the goal of this study to review the cosmetic rhinoplasty experience, including revision, complication, and dissatisfaction rates, across a wide range of rhinoplastic techniques at a private group practice.

**METHODS**

The medical records for all patients who presented to a single multisurgeon practice for rhinoplasty over the course of a 10-year period (1998-2008) were retrospectively reviewed. All primary rhinoplasties, septorhinoplasties, and revision rhinoplasties were included and had been performed by 1 of 5 surgeons. Patients in whom the rhinoplasty was performed secondary to significant midface trauma or associated with congenital craniofacial deformities (eg, cleft lip) were labeled as reconstructive and excluded. Information abstracted from the medical charts included patient demographics, preoperative complaints, preoperative physical examination findings, detailed operative data, and postoperative outcomes. Complication, revision, and postoperative patient dissatisfaction rates were calculated and analyzed for identifiable risk factors. A patient was defined as dissatisfied if, within his or her final follow-up period, the patient had expressed significant concern and desire for surgical revision based on the aesthetic outcome of the rhinoplasty procedure.

Statistical analysis of the data was conducted using the Statistical Package for the Social Sciences (SPSS) Windows version 14.0 (SPSS, Inc, an IBM Company, Chicago, Illinois) and applying the $\chi^2$ test and Fisher exact test. Significance was assessed at $P < .05$.

**RESULTS**

Medical record review identified 369 patients who underwent a cosmetic rhinoplasty procedure during the study period, for a total of 369 consecutive cosmetic procedures. The majority of patients were female ($n = 308$, 83.7%). The mean age was 33 years (range, 14-71 years), and the average body mass index (BMI) was 22.9 (range, 16.6-39.5). Pertinent past medical history for the patient population is provided in Table 1. The most common preoperative patient complaints were dorsal hump, large nose, and tip fullness, which was defined as a large tip with lack of definition. However, on preoperative exam, dorsal hump, septal deviation, and tip fullness were the most common aesthetic deformities identified by the physician (Table 2). On average, patients were seen 1.6 times prior to their operation. The average length of follow-up was 17.8 months (range, 1-130 months).

**Operative Details**

An open rhinoplasty technique was utilized in 279 (72.7%) patients. The majority of closed rhinoplasties were
performed by a single surgeon using an intercartilaginous approach. The majority of patients presented for a primary rhinoplasty (n = 201, 54.5%), followed by septorhinoplasty (n = 119, 32.2%) and secondary rhinoplasty (n = 49, 13.3%). Secondary rhinoplasties included patients whose original procedures were performed within the practice as well as those performed elsewhere. General anesthesia was used in 205 cases (55.6%), whereas intravenous (IV) sedation was used in the remaining cases. Concomitant procedures were performed in 88 cases (23.8%), most commonly breast augmentation.

The tip-modifying techniques used are described in Table 3. Osteotomies were utilized in 207 patients (56.1%). A Weir excision was performed in 12 patients (3.3%). A total of 117 cartilage grafts were used in 83 patients (23.8%), most commonly breast augmentation.

Postoperatively, 87% (n = 321) of all patients were deemed by their primary surgeon to have had successful anatomical correction of their nasal deformity.

Complications are described in Table 5. The overall complication rate was 7.9% (n = 29). Postoperative infections accounted for the greatest percentage (20.6%; 6 of 9 total complications) of all postoperative complications. Of patients who developed an infection (n = 6, 1.6%), all were successfully treated with an outpatient course of oral antibiotics. The overall dissatisfaction rate was 15.4% (n = 57; Table 6). The most common reasons for dissatisfaction were residual dorsal hump and excessive tip. Thirty-six patients (9.8%) went on to undergo a revision. Revisions were generally undertaken within the first year after surgery.

Two sample clinical results are shown in Figures 1 and 2.
cases were from within the practice, indicating that despite dissatisfaction with operative outcomes, patients seemed to generally return to their primary surgeon for revision. This may be secondary to financial considerations.

Revision rates were closely correlated to preoperative findings of tip fullness, asymmetry, and increased tip width. Furthermore, failure to adequately address these issues intraoperatively by not performing a lower lateral cartilage trim was also correlated with revision rhinoplasty ($P = .039$). This may suggest that omitting common, proven tip management maneuvers may be risky. Similar correlations were found to be associated with dissatisfaction, with many complaints centering on residual tip deformities. Tip modifications represent a point in the operation with the most potential for problems. This may be secondary to the numerous modalities (suture, trimming, grafting, reorienting) and variables that present when modifying the tip. Furthermore, patients with primary tip complaints potentially require more challenging operations to address their concern. It is this complexity that may lead to the failure of the surgeon to adequately address the underlying deformity (either by omitting or performing inadequate maneuvers), thus resulting in subsequent dissatisfaction. Our findings demonstrate that it is imperative for surgeons to adequately treat the nasal tip, paying close attention to the patient’s preoperative concerns.

The most common reasons for patient dissatisfaction were residual dorsal hump and excessive tip. These complaints represent a majority of the preoperative concerns of the patients in our series. Surgeons are cautious in overcorrecting the dorsum in fear of creating a worse deformity than that seen at presentation. Hence, a residual dorsum occasionally remains after surgery, leading to dissatisfaction and requiring subsequent revision.

In our cohort, the incidence of the patients’ preoperative complaints and physicians’ preoperative exam findings was fairly similar, suggesting a general agreement between patients and surgeons with regard to the problems requiring correction. An obvious source of dissatisfaction was failure of the surgeon to fully understand the patient’s complaint and failure to address this intraoperatively. Future areas of research should focus on investigating the incidence of dissatisfaction when patients and physicians disagree regarding the underlying indications for undergoing a rhinoplasty. In our series, surgeons deemed the patients’ noses were anatomically correct after surgery 87% of the time; however, 15.4% of patients overall were ultimately dissatisfied with their procedure. Occasionally, patients’ desires do not coincide with an anatomical result. This is invariably linked to unrealistic expectations, resulting in a dissatisfied patient and a frustrated surgeon. Regardless, clear and precise communication is an integral part of every surgical consultation, intended to ensure that patients clearly convey their desired changes and surgeons precisely explain what can be accomplished.

Our study is unique in presenting findings from a non-academic, non-subspecialized private group practice.

## Risk Factors

Factors associated with having a revision are detailed in Table 7. Patients who presented with tip fullness or a wide tip were most likely to require a revision. Men did show a trend toward increased rates of revision compared with women, but this failed to reach statistical significance (13.8% vs 7.2%, respectively; $P = .078$).

Several risk factors were associated with postoperative dissatisfaction (Table 8). Analysis of the number of preoperative visits revealed that patients who required more frequent preoperative visits expressed higher levels of postoperative dissatisfaction compared with those who visited with the surgeon a decreased number of times prior to undergoing surgery (1.93 vs 1.62 visits; $P = .05$).

Tobacco abuse, history of psychiatric medication use, closed versus open approach, rhinoplasty versus septorhinoplasty, concurrent procedures, and the use of osteotomies or cartilage grafts were not found to have any effect on revision or dissatisfaction rates.

## DISCUSSION

Cosmetic rhinoplasty continues to be one of the most challenging facial aesthetic procedures performed by plastic surgeons. Due to the thin soft tissue envelope, even the smallest changes can result in undesirable outcomes. Furthermore, the high revision and dissatisfaction rates found in some of the published literature may seem intimidating to many surgeons.

The revision rate in our series, which encompassed a wide range of patients and a diverse set of interventions, was 9.8%. It is important to note that this revision rate is much higher than the revision rate for a majority of other cosmetic procedures. As expected, dissatisfaction correlated with revision, as did the lack of anatomic correction of the patient’s preoperative complaints. One obvious issue when reviewing revision rates was the failure to identify patients who had revisions performed elsewhere. In our series, 2.7% of patients had previous rhinoplasties performed outside the practice (20.4% of all revision rhinoplasties identified). Interestingly, a majority of revision

### Table 6. Reasons for Postoperative Dissatisfaction

<table>
<thead>
<tr>
<th>Cause of Dissatisfaction</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual dorsal hump</td>
<td>20 (5.4)</td>
</tr>
<tr>
<td>Excessive tip</td>
<td>17 (4.6)</td>
</tr>
<tr>
<td>Tip deviation</td>
<td>7 (1.7)</td>
</tr>
<tr>
<td>Drooping tip</td>
<td>6 (1.6)</td>
</tr>
<tr>
<td>Dorsal irregularity</td>
<td>6 (1.6)</td>
</tr>
<tr>
<td>Dorsal asymmetry</td>
<td>4 (1.1)</td>
</tr>
<tr>
<td>Excessive dorsal width</td>
<td>3 (0.8)</td>
</tr>
</tbody>
</table>
Much of the previous data on this topic have been published by rhinoplastic surgery subspecialists. However, it is questionable whether that data accurately reflect the practice of many plastic surgeons. Most surgeons are not likely to have a practice that specializes in secondary rhinoplasty or one that develops and publishes new operative techniques. For this reason, the data presented here, which include risk factors for dissatisfaction and

Figure 1. (A, C, E) This 42-year-old woman with a history of 2 previous rhinoplasties presented with nasal bone asymmetry, V-shaped deformity, tip fullness, and tip asymmetry. (B, D, F) Five months after an open revision rhinoplasty, consisting of a dorsal hump reduction, lower lateral cartilage trim, caudal septal trim, and tip sutures. A previously placed columnellar strut graft was also removed, with subsequent placement of a dorsal spread graft.
revision, are applicable to the typical cosmetic plastic surgeon with a broad clinical practice, as well as to a large portion of the patients most surgeons see in consultation for cosmetic rhinoplasty. Although we do not assert that rhinoplasty is a straightforward procedure accessible to each and every surgeon, our data definitively support the idea that quality rhinoplasty results are achievable by private practice plastic surgeons with broad clinical practices.

### CONCLUSIONS

Our study showed low revision (9.8%), complication (7.9%), and dissatisfaction (15.4%) rates for rhinoplasty patients seen in a group practice setting. All rates are within the established ranges of the published literature. Risk factors identified for revision and dissatisfaction included lack of intraoperative treatment of the nasal tip and occurrence of postoperative complications. These data support the

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**Table 7.** Risk Factors Associated With Revisions

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tip fullness</td>
<td>.016</td>
</tr>
<tr>
<td>Wide tip</td>
<td>.005</td>
</tr>
<tr>
<td>Lack of lower lateral cartilage trim</td>
<td>.039</td>
</tr>
<tr>
<td>Any complication</td>
<td>.039</td>
</tr>
<tr>
<td>Postoperative infection</td>
<td>&lt;.049</td>
</tr>
</tbody>
</table>

**Table 8.** Risk Factors Associated With Dissatisfaction

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative technique</td>
<td></td>
</tr>
<tr>
<td>No lower lateral cartilage trim</td>
<td>.000</td>
</tr>
<tr>
<td>No transdomal suture</td>
<td>.003</td>
</tr>
<tr>
<td>Postoperative course</td>
<td></td>
</tr>
<tr>
<td>Any complication</td>
<td>.003</td>
</tr>
</tbody>
</table>

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**Figure 2.** (A, D, G) This 24-year old woman with a large dorsal hump presented for a primary rhinoplasty. (B, E, H) Eighteen months after a primary closed rhinoplasty was performed via an intercartilaginous approach consisting of dorsal hump reduction, lower lateral cartilage trim, caudal septal trim, and osteotomies. A residual dorsal hump and dorsal irregularities can been seen. (C, F, I) One year after an open revision rhinoplasty where the dorsal hump was further reduced, tip sutures were placed, and a more aggressive caudal septal trim was performed.
assertion that quality rhinoplasty results are achievable within a broad-based plastic surgery group practice.

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REFERENCES