Revision Rhinoplasty of Asian Noses

Analysis and Treatment

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**Objective:** To analyze postrhinoplastic deformities in Asian noses and the differences between noses of white and Asian patients. For a successful revision rhinoplasty, one of the most difficult and unpredictable procedures in plastic surgery, an accurate diagnosis and analysis of error are needed.

**Design:** A retrospective study of 84 revision rhinoplasties performed by the senior author (C.H.P.) from January 2001 through December 2006.

**Setting:** Tertiary care rhinology clinic.

**Patients:** The study population comprised 84 patients (28 men and 56 women), with a mean age of 36 years (range, 20-58 years).

**Main Outcome Measures:** The postrhinoplastic deformities were divided anatomically into the upper, middle, and lower thirds of the nose with further subdivision of the deformities within each group.

**Results:** In the 84 patients studied, the mean number of rhinoplasties per patient was 2.3. Of the 84 patients, 75 (89%) underwent revision rhinoplasty for upper-third deformities. Overall, deviated dorsum was the most common deformity, followed by irregular dorsum and asymmetric tip. Most of the upper-third deformities were treated with a rasp, camouflage graft, and expanded polytetrafluoroethylene (Gore-Tex; W. L. Gore & Associates Inc, Flagstaff, Arizona) augmentation. To correct lower-third deformities, mostly tip problems, we used transdermal and interdermal sutures.

**Conclusions:** In Asian noses, unlike noses of white patients, the most common cause of revision rhinoplasty is upper-third deformities. As most upper-third deformities in Asian noses result from inadequate insertion or dislocation of the augmentation graft material, we must be careful in our selection of implants and augmentation.


Revision rhinoplasty challenges the skill and judgment of the rhinoplasty surgeon. The task of maintaining and creating the naturalness and uniqueness of the individual nose is complicated by scarring and the loss of tissue and support. These factors, in addition to the grafting often required for correction, increase the risks and vagaries of healing and reduce the predictability of the final aesthetic result.

Revision rhinoplasty is performed for 2 basic reasons. The first is the need to resolve a difference in the communication of the aesthetic goals between the patient and surgeon. The second is a technical failure in the prior operation(s) because of a misdiagnosis of the anatomy or an error in executing the surgery. Therefore, the revision rhinoplasty surgeon must identify whether the patient dissatisfaction is because of a true surgical complication or attributable to a less tangible reason.

The recent increase in aesthetic facial surgery and use of the Internet to obtain information in Asia has yielded a more discriminating, informed patient with higher expectations. Consequently, the number of revision rhinoplasties has increased rapidly. To correct postoperative rhinoplasty deformities, it is important to identify the deformity using a systematic approach. However, most facial analysis studies have been based on characteristics in whites, and none have analyzed the deformities of postrhinoplasty Asian patients, although obvious ethnic differences exist in the features and treatment of revision rhinoplasty.
This was a retrospective study of all revision rhinoplasties performed by the senior author (C.H.P.) during a 5-year period. Between January 2001 and December 2006, the senior author performed 84 revision rhinoplasties at Chuncheon Sacred Heart Hospital, Chuncheon, South Korea. Of the 84 patients, 28 were men and 56 were women, with a mean age of 36 years (range, 20-58 years). Medical record reviews were performed, and appropriate information regarding postrhinoplastic deformities and treatment was obtained from the history and physical examination, operating notes, and preoperative and postoperative photographs. The analysis of the standardized preoperative slides included frontal, basal, left and right lateral, and three-quarter views. The nose was divided into thirds, and each area was studied individually by 5 rhinoplastic surgeons. Specific deformities were noted in the upper thirds, and each area was studied individually by 5 rhinoplastic surgeons. Specific deformities were noted in the upper thirds, and each area was studied individually by 5 rhinoplastic surgeons.

In the 84 patients studied, the mean number of rhinoplasties per patient was 2.3, with 62 patients (74%) undergoing 1 previous procedure and the remainder (26%) between 2 and 5. Typically, the revision procedures were performed less than 1 year postoperatively (Figure 1). In 29 revision rhinoplasties (35% of the revision cases), the senior author was the primary rhinoplastic surgeon, while the others were performed by another physician.

The primary surgery in this population group was performed using a closed approach in 67% of the patients and an open approach in 33%. Sixty-four patients underwent nasal dorsum augmentation: silicone was used as graft material in 27 patients and expanded polytetrafluoroethylene (Gore-Tex; W. L. Gore & Associates Inc, Flagstaff, Arizona) in 23. For tip surgery in primary rhinoplasty, most of the patients received septal cartilage as the graft material. In 43 patients, upper-third deformities were corrected previously; of these, 25 patients underwent medial lateral osteotomies (Table 1). The deformities were divided anatomically into the lower, middle, and upper thirds of the nose, which comprised 57, 22, and 75 deformities, respectively. The lower third was further classified into columellar deformities and tip or ala problems (Table 2). The 13 columellar deformities consisted of hanging, retracted, and deviated columella.

The 140 tip or ala problems were categorized as underprojecting tip, contracted tip, asymmetric tip, full tip, overprojecting tip, retracted ala, and asymmetric nasal valve (Figures 2, 3, 4, 5, and 6). A hanging columella was the most common columellar deformity, while an asymmetric tip was the most common tip deformity (Table 3). Deformities of the middle third of the nose were categorized as pinched supratip, pollybeak, uneven middle dorsum, widened middle dorsum, and saddle nose, which was the most common deformity (Table 3, Figure 7). The most common deformity in the upper third of the nose was a deviated dorsum. Other deformities of the upper third of the nose were an irregular dorsum, widened dorsum, overaugmentation, underaugmentation, infection, protrusion, implant showing, and blunting of the nasofrontal angle (Table 3, Figures 2, 3, 4, 5, 6, and 7).

Various treatment modalities were also analyzed (Table 4). Most of the tip deformities were treated with transdoral and interdoral sutures, and an irregular dorsum was frequently treated with a rasp. We used a closed

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**Table 1. An Analysis of Previous Rhinoplasty**

<table>
<thead>
<tr>
<th>Previous Rhinoplasty</th>
<th>Procedures, No. (%)</th>
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</thead>
<tbody>
<tr>
<td>Graft material</td>
<td></td>
</tr>
<tr>
<td>Silicone</td>
<td>27 (42)</td>
</tr>
<tr>
<td>Gore-Tex</td>
<td>23 (39)</td>
</tr>
<tr>
<td>Rib cartilage</td>
<td>9 (14)</td>
</tr>
<tr>
<td>Septal cartilage</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Injection</td>
<td>2 (3)</td>
</tr>
<tr>
<td><strong>Augmentation (64 Patients)</strong></td>
<td></td>
</tr>
<tr>
<td>Graft material</td>
<td></td>
</tr>
<tr>
<td>Silicone</td>
<td>13 (21)</td>
</tr>
<tr>
<td>Auricular cartilage</td>
<td>9 (15)</td>
</tr>
<tr>
<td>Rib cartilage</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Injection</td>
<td>1 (1)</td>
</tr>
<tr>
<td><strong>Tip Surgery (62 Patients)</strong></td>
<td></td>
</tr>
<tr>
<td>Operating technique</td>
<td></td>
</tr>
<tr>
<td>Medial lateral osteotomy</td>
<td>25 (58)</td>
</tr>
<tr>
<td>Rasp</td>
<td>8 (13)</td>
</tr>
<tr>
<td>Medial intermediate osteotomy</td>
<td>7 (12)</td>
</tr>
<tr>
<td>Camouflage</td>
<td>3 (5)</td>
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</tbody>
</table>

**Table 2. Type of Revision Rhinoplasty Deformity**

<table>
<thead>
<tr>
<th>Location of Deformity</th>
<th>Procedures, No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper third</td>
<td>75 (89)</td>
</tr>
<tr>
<td>Middle third</td>
<td>22 (26)</td>
</tr>
<tr>
<td>Lower third</td>
<td>57 (68)</td>
</tr>
<tr>
<td>Upper + middle third</td>
<td>4 (5)</td>
</tr>
<tr>
<td>Upper + lower third</td>
<td>57 (44)</td>
</tr>
<tr>
<td>Middle + lower third</td>
<td>4 (5)</td>
</tr>
<tr>
<td>Entire nose</td>
<td>13 (15)</td>
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</tbody>
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**Figure 1. Timing of the revision rhinoplasties.**
approach for 64 patients, reserving the open technique for cases in which very complex grafting was indicated.

**COMMENT**

In revision rhinoplasty, as an absolute anatomic diagnosis is often difficult to make preoperatively, patients are asked to consider the risks and benefits of the surgery and to return for a second consultation. Their attitude is thought to be more positive at the reevaluation, when photographs outlining the deformity are reviewed with the patient and the limitations of revision surgery are reiterated. The surgeon must feel confident that the patient is a good psychological candidate before undertak-

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**Figure 2.** A 39-year-old woman who underwent 3 rhinoplasties using a dorsal silicone implant and who sustained multiple infections after rhinoplasty presents with a severely contracted nose with poor skin elasticity and integrity. A, This case involved a severe contracted tip with the destruction of lower lateral cartilage and skin with soft-tissue depression due to infection (lower-third deformity). B, Postoperative photographs taken 3 months after a 4-mm-thick augmentation after removal of a silicone implant and placement of a septal extension graft carved from rib cartilage. C, Illustrations of the procedures. Postoperative views (B) demonstrate the desired increased nasal extension, tip profile, and dorsal augmentation.
ing this surgery. During surgery, the preoperative diagnosis is confirmed or a different diagnosis is made by direct observation. A full delivery technique, or in extreme cases, an open procedure may be required.

Scarring and tissue loss accompany postrhinoplasty deformities, often making a precise preoperative anatomic diagnosis difficult. In addition, many noses on which an operation is performed will have more than 1 deformity. Adamson\(^3\) categorized revision rhinoplasty patients according to the number of deformities present. In his study, 50\% of the patients had 1 deformity, 30\% had 2 deformities, and 20\% had 3 or more defor-

Figure 3. A 42-year-old woman underwent rhinoplasty using a dorsal silicone implant 5 years earlier and is unhappy with underprojecting tip and the deviated nose. A, This case involved an underprojecting tip, together with the irregularity of the right dorsum due to silicone implant (upper- and lower-third deformity). B, Postoperative photographs taken 3 months after revision surgery in which a 4-mm-thick reinforcement expanded polytetrafluoroethylene (Gore-Tex; W. L. Gore & Associates Inc, Flagstaff, Arizona) implant was used for dorsal augmentation after the removal of a silicone implant and placement of a 2-layer septal cartilage onlay graft to lower the nasal tip. C, Illustrations of the procedures. Postoperative views (B) demonstrate the desired projecting nasal tip and dorsal augmentation.
In contrast, in our study, 79% of the patients had 2 or more deformities and the results were similar to those of Vuyk and Watts. This relatively high figure may have occurred because our study included a wider range of deficiencies. Regarding the location of the deformities, several studies indicate that the lower third is the site where the greatest number of deformities are found, followed by the middle third. Only 1 study has mentioned the middle third, and more specifically a pollybeak deformity, as the most frequent cause of revision. Unlike other studies in which almost all of the patients were white, the patients in our study were all...
Asian, and the most common location of a deformity was the upper third (75 patients [89%]), followed by the lower third (57 patients [68%]).

In a review of 126 revision cases, Kamer and McQuown\(^6\) arbitrarily divided postrhinoplasty deformities into major and minor. The categories in our study that matched the criteria for major deformities in the article by Kamer and McQuown\(^6\) included pollybeak formation, saddling, middle nasal asymmetry, and columellar retraction. In the upper third, the most common problem is a deviated dorsum (62 patients [89%]). The deviated dorsum is due to subluxation or a deviated septum in the upper portion of the nose, unequal treatment of the 2 nasal bones, or failure to

Figure 5. This 58-year-old man underwent rhinoplasty using a dorsal silicone implant to correct a traumatic deviated nose 18 years earlier. A, The silicone used for dorsal augmentation had nearly extruded through the skin, and the patient had a notable deviated nose due to the inappropriate size of the silicone implant (upper- and lower-third deformity). B, Postoperative photographs taken 5 months after revision surgery in which a postauricular dermis tip graft was used for repair after the removal of a silicone implant. C, Illustrations of the procedures. Other procedures performed were lateral osteotomy and rasping. Postoperative views (B) demonstrate the improved tip and nasal dorsum.

In a review of 126 revision cases, Kamer and McQuown\(^6\) arbitrarily divided postrhinoplasty deformities into major and minor. The categories in our study that matched the criteria for major deformities
correct preexisting asymmetry. Since most patients had undergone augmentation previously, the asymmetry seen in our study was mainly due to inadequate insertion or dislocation of graft material, bony asymmetry secondary to incomplete osteotomies, or preexisting bony asymmetry. In our study, the dorsal deviation was most often treated with a rasp, camouflage graft, and Gore-Tex subluxation augmentation. The most common abnormality in the lower nasal third in terms of nasal tip position is underprojection, the majority of which is caused by the disruption of 1 or more of the 3 important tip support mechanisms,

Figure 6. A 26-year-old woman underwent open rhinoplasty using a dorsal silicone implant 1 year earlier. She sustained infection after rhinoplasty, and a silicone implant was removed with an intercartilaginous incision, while administering an intravenous antibiotic. All the inflammation and swelling were resolved before a secondary rhinoplasty. A. The patient had a poorly defined tip, a flat and irregular dorsum with an open roof deformity, and contracted nose (upper-, middle-, and lower-third deformity). B. Postoperative photographs taken 3 months after the insertion of a 4-mm-thick reinforcement expanded polytetrafluoroethylene (Gore-Tex; W. L. Gore & Associates Inc, Flagstaff, Arizona) implant, placement of a septal extension graft and a 2-layer onlay graft, cephalic resection, and columellar strut placement. C. Illustrations of the procedures. Postoperative views (B) demonstrate the desired defined nasal tip and dorsal augmentation.

Augmentation using Gore-Tex
Cephalic resection
Septal extension graft using septal cartilage
2-Layer onlay graft of septal cartilage
Strut
Transcolumellar marginal incision
namely, the attachment of the medial crura to the nasal septum, the shape and resilience of the alar cartilages, and the attachment of the alar cartilages to the upper lateral cartilages. In our study, most of the underprojection of nasal tips was due to the absorption of graft materials used in the previous surgery.

The evaluation of nasal tip shape showed that asymmetry was common. Directly related to the loss of tip projection, the dorsal angles widen, changing the tip from pointed to a wider, blunted trapezoid shape. Subsequently, the skin’s soft tissues must adapt to the smaller nasal tip cartilage skeleton, leading to skin thickening and blunting. Scar formation, particularly after traumatic dissection of the soft-tissue envelope from the nasal skeleton, may further compound the problem. For the tip, to correct deformities, we used the transdermal and interdermal suture technique, columellar struts, and onlay grafts. Saddle nose, the most common problem in middle third, is due to the excessive removal of bone or cartilage from the nasal dorsum. In our study, we used augmentation to treat saddle noses. Rhinoplasty of Asian noses differs in many fundamental ways from that of noses of white patients. The objective of rhinoplasty in Asian patients is often augmentation, of both the depressed dorsum and receded tip. In contrast, rhinoplasty in white patients frequently mandates the reduction of a prominent dorsum or bulbous tip. The underlying nasal anatomy of Asian patients also is remarkably different, exhibiting a thicker skin envelope and weaker, ill-defined cartilages. The surrounding facial structures tend to be flatter in their dimensions because of a fuller upper eyelid, shallower orbital socket, malar hypoplasia, and premaxillary deficiency. The flatter contour of the Asian midface limits the amount of augmentation that can be achieved without disturbing the overall facial harmony and balance.

It should be noted that a limitation of our study was the failure to have before-and-after photographs reviewed in a blinded and objective fashion, and therefore the assessment of the deformities may be biased. Nevertheless, compared with other studies of white patients, we presume that these manifold differences between the races gave rise to the different results in our study.

In conclusion, revision rhinoplasty demands an accurate diagnosis and analysis of the errors that produced the failure. In Asian noses, unlike noses of white patients, the most common cause of revision rhinoplasty is upper-third deformities. Therefore, if we want to achieve good results in rhinoplasty in Asian patients, although we cannot always attain perfection, we should do our best in upper-third procedures, such as in implant selection, augmentation, and osteotomy.

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Figure 7. This 36-year-old woman underwent septorhinoplasty for a deviated septum 2 years earlier. The patient complained of a depressed and deviated nasal dorsum. A, This patient had a significant saddle nose, together with a deviated nose (middle- and upper-third deformity). B, Postoperative photographs taken 6 months after a triple-layer 2-mm-thick expanded polytetrafluoroethylene (Gore-Tex; W. L. Gore & Associates Inc, Flagstaff, Arizona) implant was placed over the dorsum. C, Illustrations of the procedures, which included auricular cartilage graft harvest, insertion of a 4-mm-thick reinforcement Gore-Tex implant after implant removal, a spreader graft, a 2-layer onlay graft, a postauricular dermis camouflage graft, and columellar strut placement. Postoperative views (B) show a straightened dorsum.
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**REFERENCES**