Asian Rhinoplasty Techniques

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ABSTRACT

Asian rhinoplasty is a broad term that refers to a set of rhinoplasty techniques commonly used in Asian populations. Although these techniques are well developed and documented in Asian languages, there are relatively few English-language articles on the subject, and even fewer on current debates and controversies among plastic surgeons. Knowledge of these different techniques is essential to perform an adequate rhinoplasty in Asians. For Western patients, reduction rhinoplasty with dorsal hump rasping and lower lateral cartilage resection is classic. In contrast, silicone implant augmentation rhinoplasty is the most commonly used technique in Orientals. This article focuses on current rhinoplasty practices and controversies in Asia. It reviews morphologic differences between the Oriental and Western noses, as well as common patient requests. Polytetrafluoroethylene (Gore-Tex) and silicone implant augmentation are discussed. A new augmentation rhinoplasty with diced cartilage is described in more detail.

KEYWORDS: Augmentation rhinoplasty, Asian, implant, diced cartilage, aesthetic surgery, Oriental

Rhinoplasty and blepharoplasty are probably the most popular cosmetic surgeries performed in Taiwan^{1,2} and most of the Far East.³⁻⁶ Compared with Caucasians, Asians generally have a shorter, wider, and less projecting nose. Whereas reduction rhinoplasty with dorsal hump reduction and some form of lower lateral cartilage reduction is more popular in Caucasians,⁷⁻⁹ augmentation rhinoplasty is most frequently performed in Asian patients.^{1,2,6,10,11}

Rhinoplasty techniques have a long history in Asia and have been extensively practiced for years.^{4,12-18} Techniques are still improving, and different controversies give rise to interesting debates. Unfortunately, there are relatively few recent publications from Asia in the English-language literature.^{1,2,11} The purpose of this article is to review the anatomy of the Southeast Asian nose (Oriental nose), discuss common patient complaints, and offer an overview of common implants and

autogenous rhinoplasty techniques currently used in Asia. Procedure indications, technical aspects, and controversies are discussed as well.

ANATOMY OF THE ORIENTAL NOSE

There are many types of Oriental nose morphologies.¹⁹ There is, however, a common set of characteristics that differentiates them from Caucasian noses. To better analyze these differences, the nose can be divided in thirds. In its upper third, the nasal bridge is lower.¹ In the middle third, the dorsum is less projecting.¹ Japanese patients also frequently present a convex dorsum.¹¹ In the lower nasal third, there is less tip projection,^{5,19} a poorly defined or absent supratip break, and a rounder nasal tip^{2,5,19} with infratip fullness. The labionasal angle is sharper,¹ and the nasal base is wider compared with nasal height.^{1,2,5,19} Alar flaring among some Koreans has

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been attributed to increased skin thickness, hypertrophy of the dilator naris anterior, and a more anterior insertion of the dilator naris posterior.²⁰

COMMON PATIENT REQUESTS

Most patients requesting rhinoplasty ask for dorsum augmentation and tip projection improvement.^{1,2} Although a supratip break is sometimes requested, it is extremely discrete when compared with what Western surgeons are familiar with. Another important difference with Caucasian patients is the almost universal request to have a full infratip lobule.

Patients presenting with short and flat noses is also quite frequent. They require concomitant nasal lengthening. Alar flaring is also relatively frequent and may require alar reduction. Dorsal hump and tip reduction⁹ are infrequently encountered in Orientals.

Western surgeons might benefit from asking Asian patients to bring pictures of desirable noses to ensure that the patients' requests are well understood. Aesthetic standards are quite different between Oriental and Western cultures, and to a lesser degree between East Asian countries. Even in the medical literature, it appears that similar descriptive terms have different significations. For instance, creating a "supratip break" means creating a very discrete angle often difficult to locate for most lay observers. For Western surgeons, this usually means creating a clearly identifiable angle that is easily measurable on lateral photographs.

SURGICAL PROCEDURES

Silicone implant augmentation is the most widely performed type of augmentation rhinoplasty in Asia.^{1,2,11,21} Gore-Tex (polytetrafluoroethylene; W.L. Gore & Associates, Flagstaff, AZ) is also popular, mostly in Korea.²² The popularity of silicone implants is multifactorial: aesthetic results are usually superior to autologous augmentation in Asians, implants are cheap, the procedure is straightforward, there is no donor-site morbidity, complications are relatively low, and it does not cut bridges for a salvage autologous rhinoplasty in case of complications. Implant rhinoplasty is thus the first choice for Asian rhinoplasty. Autologous rhinoplasty indications are a patient requesting an autologous rhinoplasty, failed implant rhinoplasty, short nose, and correction of severe nasal deformity (such as congenital malformations and traumatic deformities).

Polytetrafluoroethylene Augmentation

Polytetrafluoroethylene (PTFE; Gore-Tex) has been frequently used for dorsum and/or tip augmentation in Korea²² as well as in China.²³ W.L. Gore & Associates stopped selling Gore-Tex implants to the plastic surgery

field on December 31, 2006, to concentrate its activities on other surgical markets. There are no official alternative suppliers for the moment.

Rhinoplasty techniques using PTFE for tip augmentation are sometimes referred to as a "Korean-style rhinoplasty." PTFE usually comes in the form of sheets that need to be carved into the proper shape.²³ PTFE sheets are usually thin compared with silicone implants and might therefore be more useful for small augmentations. Larger augmentations require stacking of sheets.

TECHNICAL POINTS

Zhanqiang²³ clearly describes and illustrates the steps necessary to carve a PTFE sheet to augment the dorsum and the nasal tip in Chinese patients. Two partial-thickness transverse incisions (80% of the sheet's thickness) are made in the sheet, one at the level of the nasion and the other at the nasal tip. This allows sharp bending of the sheet and its conformation to the nasal profile. The width of the implant is then decided. The columella and tip are thinned in width. The implant's width then enlarges gradually up to the nasion. The deep surface of the implant is then carved to fit the dorsum. The implant's thickness is tapered out gradually at the glabella to form a smooth junction with the frontal bone. The dorsum of the implant is then rounded along its length. Finally, the columella is thinned.

COMPLICATIONS

Jin et al from Korea have published a large series of patients who have received PTFE implants for either dorsum or tip augmentation.²² In the 853 patients studied, complications occurred in 4.2%. The most common complication was infection (2.1%). Implant removal was required in 2.2% of cases. Others report similar implant removal numbers (2.7% of cases).²⁴ No extrusions are reported.

Silicone Implant Augmentation

Silicon implant augmentation is generally considered to provide the best aesthetic results in Asians.²⁵ There are several debates concerning which shape of implant can achieve the best aesthetic results. There are two general shapes of nasal implants: I-shaped⁶ and L-shaped.¹⁷ Classic I-shaped implants augment mostly the dorsum.²⁶ Surgeons who currently use them usually perform a concomitant tip-plasty to increase tip projection. Some I-shaped implants also have a tip extension.²⁶ These implants are placed subperiosteally on the nasal dorsum⁶ and act as cantilever grafts to augment the dorsum and support tip projection. However, these implants are relatively soft and are generally thought to provide less support for the tip than do L-shaped implants as a columellar extension is absent. Cartilage grafting over the implant tip can also be used to provide more tip

projection. Because I-shaped implants are thought to have a propensity to slide inferiorly, cartilage grafting of the tip might also provide more tissue padding and prevent extrusion through the nasal tip.

The L-shaped implant provides both dorsum and tip augmentation.¹⁷ The columellar extension provides support for tip projection and can also provide volume when there is little columellar show. Critics find that the tip projection is excessive because of this columellar extension, provides an unnatural look, and favors implant extrusion.²⁶ It is therefore critical to shorten the columellar part of the implant before inseting. Other surgeons prefer to place an ear cartilage graft over the implant tip to better control the tip shape and infralobule fullness. L-shaped implants appear to be the most commonly used implant shape.^{2,11,27}

TECHNICAL POINTS

Figure 1 illustrates the placement of the most frequently used silicone implant: the L-shaped implant. Figure 2 demonstrates its use in a typical case. The implant should be placed in a subperiosteal plane. The periosteum overlying the nose has a high tensile strength.²⁸ It can better conceal implant edges and potential capsular contracture. Inserting the implant in a more superficial plane will likely cause implant visibility. A tight-fitting subperiosteal pocket will also prevent lateral migration of the implant.²⁶

Figure 1 Silicone implant for nasal augmentation. The L-shaped implant is the most frequently used. It should be placed subperiosteally. Note that its extremity tapers off in the glabellar region. In the tip region, sufficient soft tissue should be left on the skin flap to cover the implant tip.

COMPLICATIONS

The largest multisurgeon series of silicone implant augmentation rhinoplasties in Asians has been performed at Chang Gung Memorial Hospital.² Augmentation rhinoplasty with silicone implants yields a 16% complication rate and an 8% reoperation rate.² Infection occurs in 5.3% of cases. Extrusion occurs in 2.8% of cases, either eroding through the nasal tip (70%) or on the posterolateral aspect of the columella (30%). Deviation occurs in 5.0% of cases, and other deformities occur in 2.8% of cases. They are usually caused by capsular contracture. Larger implants yield a higher infection and extrusion rate. Complications do not appear to increase with secondary rhinoplasty. It is also interesting to note that extrusion of I-shaped implants is mostly through the infratip lobule, whereas L-shaped implants extrude through the superior aspect of the lobule.

Autogenous Augmentation

Autogenous augmentation is the gold standard in Caucasian patients. In Asians, indications are mostly reserved for patients explicitly requesting autogenous augmentation, for failed primary implant rhinoplasty, short nose, and severe nasal deformities such as in cleft lip patients.

Oriental patients who request rhinoplasty most often require significant dorsal and tip augmentation. Standard cantilever bone grafts²⁹ or cartilage techniques have been found to provide inferior aesthetic results to those of implant augmentation.²⁵ Bone grafts are known to undergo resorption, and large cartilage grafts over the dorsum often warp over time. They are therefore infrequently used.

Diced cartilage in rhinoplasty has been reported.^{30–35} It usually involves dicing cartilage, which is then wrapped in fascia or Surgicel (Ethicon, Somerville, NJ) and inserted in the appropriate location. This wrapping is meant to prevent dorsum irregularities caused by visible cartilage cubes once the swelling has subsided. Our center has refined and simplified a diced cartilage technique over the past years. Cartilage is diced very finely and no fascial sleeve is needed. It has been used extensively, mostly for correction of cleft lip nasal deformities, but also for nasal reconstruction after silicone implant complications.

There are several advantages to the diced cartilage method (Fig. 3). First, there is no warping with this technique. Second, the nasal shape can be adjusted postoperatively over 1 to 2 months. Third, there are fewer postoperative complaints from difficult patients as they can gradually alter the final shape of the nose after surgery. Figure 4 illustrates use of the diced cartilage technique to correct a short nose deformity from a silicone implant contracture.

Figure 2 Silicone implant nasal augmentation. (A–C) Preoperative views; (D–F) 1.5 months postoperatively. The patient has also had mandibular angle reduction and lengthening-advancement osseous genioplasty.

DICED CARTILAGE TECHNIQUE

The cartilaginous part of the eighth rib is harvested. A columellar strut and a dorsal onlay graft are carved. The rest of the cartilage is finely cut into 1-mm³ cubes and soaked in an antibiotic solution (kanamycin sulfate 1 g diluted in 250 to 500 mL NaCl 0.9%). Syringes (1 cc) with cut tips are filled with diced cartilage.

An open rhinoplasty approach is used. Alar cartilages are exposed, and a subperiosteal dorsal pocket is dissected. A tunnel for the columellar strut is dissected to the nasal spine, and the columellar strut is inserted. A dorsal onlay graft is inserted subperiosteally. The dorsal onlay graft is sutured in a set square configuration with the columellar strut. The columellar strut is trimmed at a proper length and the nose is closed, leaving only a small opening in the alar rim on one side for cartilage in-

jection. Two to 4 cc of diced cartilage are usually injected gradually, molding it in place as it is injected. The dorsum should be molded straight, with a discrete supratip break. Infratip lobule fullness is also important to achieve. Standard nasal taping is made, and a protective thermoplastic mold is placed over the nasal dorsum.

POSTOPERATIVE COURSE AND COMPLICATIONS

Stitches are removed at the same time as mold removal at 5 to 7 days postoperatively. Patients are instructed to massage the nose for 3 to 5 minutes, 10 times a day for the first 1 to 2 months. This helps reduce swelling and adjust nasal shape if necessary. There are no restrictions in activities of patients as long as they have adequate nasal protection. Nasal tip swelling is more important with this technique. However, most swelling subsides by

Figure 3 Nasal augmentation with the diced cartilage method. A columellar graft is maintained in position with a dorsal onlay graft. In cleft lip patients, a cartilage graft is also inserted in the ala of the affected side to restore symmetry. The rhinoplasty incisions are closed except for a small opening in one of the nostrils. A syringe is used to inject the diced cartilage through that opening until the desired augmentation is obtained. Note that there is diced cartilage injected from the glabella to the nasal tip. It is also very important for Asians to augment the infratip lobule with diced cartilage.

Figure 4 Diced cartilage augmentation for correction silicone implant complication. (A–C) Patient presenting a short nose deformity secondary to a chronic silicone implant infection, which caused severe contracture and shortening of the nose. (D–F) Five months after nasal reconstruction with the diced cartilage technique. Note the good dorsum augmentation and adequate nasal lengthening. The patient was very happy with the result and declined revision of the slightly round tip.

1 month. At 3 months, one has a good idea of the final shape. Healing is complete at 6 months to 1 year post-operatively.

Infections occurred in the early cases, but the problem was greatly improved after soaking the diced cartilage in an antibiotic solution before injection. Intravenous cephamezine 500 mg is given at induction. Oral antibiotics are given for 3 to 5 days.

Other complications include nasal asymmetry and nasal tip blunting from excessive diced cartilage injection. No cartilage extrusion has been encountered. Cartilage irregularities can sometimes be palpated through the skin but are not visible. This is probably due to the finer cartilage cubes used and the subperiosteal injection over the dorsum. A fascial sleeve is therefore not needed.

CONCLUSION

The particularities of the Oriental nose and common patient complaints have been reviewed. Implant and autogenous rhinoplasty techniques and controversies have also been discussed. Surgical approaches and goals are different than for Western patients. The key to a successful Asian rhinoplasty is therefore communication between the surgeon and the patient and selection of an appropriate technique.

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