

Augmentation Rhinoplasty Using Silicone Implants

In-Sang Kim, MD

KEYWORDS

• Augmentation rhinoplasty • Asian rhinoplasty • Alloplast • Silicone • Wing graft

KEY POINTS

- Silicone implants can be safely used for nasal dorsal augmentation if precautions are taken.
- Autologous cartilages are preferred for the tip, in contrast to the dorsum.
- Multiple onlay grafts are stacked to achieve adequate tip projection.
- Septal extension graft provides support and stability for the stacked onlay grafts and prevents deterioration of columellar-lobular ratio.
- The wing grafts are essential to prevent pinching deformity and graft visibility when using multiple onlay grafts.

INTRODUCTION

Dorsal augmentation is a challenging task for rhinoplasty surgeons in Asia because the required amount of augmentation is frequently substantial.

Autologous materials, such as rib cartilages, diced cartilages wrapped in fascia, and dermis or dermofat grafts, are used for dorsal augmentation by many Asian surgeons. However, silicone augmentation is still the dominant practice in Asian countries.

Alloplastic implants have advantages over autologous materials, such as ease of use, unlimited supply of volume, less invasive nature of the procedure, and incomparably superior aesthetic outcomes.

AUGMENTATION RHINOPLASTY USING SILICONE IMPLANTS

Asian rhinoplasty is unique in many aspects. The nasal dorsum of Asians is relatively flat and wide, even though a high and well-defined nasal bridge is preferred in Asian cultures.

There are some aesthetic considerations that need to be comprehended and managed for augmentation rhinoplasty in Asians.

The nose should enhance the beauty of the ethnic Asian face harmonizing with other facial

parts, such as relatively flat, rounded forehead and mala. The nose should not stand out too prominently to draw attention from others.

The transition from forehead to nasal bridge is very smooth and gentle, especially in women. The nasofrontal angle in Asians is not structured; rather it is a smooth gracious curvature. When this shallow curvature is obliterated by overaugmentation, an unnatural and operated look will result.

There are some technical difficulties and nuances in Asian rhinoplasty; techniques that are highly successful in Caucasian noses are frequently insufficient or unsatisfactory in Asians.

Small attenuated lower lateral cartilages with short medial crura covered with thick skin make sculpting or suturing tip techniques unsatisfactory in many Asian noses.¹

Septal extension graft also may not provide sufficient tip projection and definition as desired by the patient. In addition, risk of complications is high, such as septal buckling and tip drooping due to weak caudal septum. Septal cartilages are frequently thin and small, especially in Asian women.

Given that augmentation rhinoplasty is one of the most common aesthetic procedures in Asia, the patient's expectation is generally high on the outcome, and prompt recovery without significant

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Doctor Be: Aesthetic Clinic, A238, 316 Eun-ma Shopping Mall, Daechi-Dong, Gangnam-Gu, Seoul 06284, Korea
E-mail address: drbe0911@gmail.com

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morbidity is anticipated. In this regard, silicone is still the material of choice for many surgeons in Asian countries.

Use of rib cartilage is related to chest scarring, possible pneumothorax, prolonged operation time, and high emotional or economic burden on the patient. The rigid immobile tip of rib cartilage is often odd and unpleasing. Also, rib cartilage is not immune to complications. Warping and resorption are frequent, and although infection is uncommon, it is possible. Because of its solid nature it may get fractured with trauma more easily than elastic alloplastic implants. In this regard, rib cartilages are reserved as a last resort rather than as a primary choice for primary aesthetic rhinoplasty by many surgeons. Use of rib cartilage in a primary aesthetic rhinoplasty should be evaluated carefully on the benefits and costs, patient's comfort level, and possibility of overtreatment.

For diced cartilages and dermal/dermofat grafts, inevitable problems exist, for example, resorption, irregularity, insufficient volume, increased operation time, morbidity, and scar in different body parts.

Silicone is free from resorption and deformation. Silicone has advantages over other alloplastic materials as well. Because of its nonporous nature, silicone does not harbor bacteria internally and is easily sterilized with antiseptic solution.²

In contrast, porous implants are theoretically more susceptible to infection. Pore size greater than 1 μm allows for ingress of bacteria, whereas macrophages require pore sizes of 30 to 50 μm . Several studies have shown that the risk of infection of biomeshes is influenced by the presence of micropores, as bacteria are able to settle in these structures where they are protected against the actions of macrophages, which cannot penetrate the biomaterial.³

Silicone implants are formed from the polymerization of silica (SiO_2) and subsequent crosslinking

and extension of the material, which can create either silicone gel or rubber, depending on the specifics of the preparation. Silicone rubber is also available in a range of consistencies, such as soft, medium, and firm.⁴

Silicone rubber resists modification by the host tissue, and it is chemically inert, eliciting only a minimal host response.

Silicone rubber has high resilience against compression or deformation. It maintains its original shape through a wide range of temperatures from -55°C to $+400^\circ\text{C}$; therefore, it can be autoclaved without damaging its qualities.⁵

Prefabricated silicone implants are available in different styles in the market; however, they will not correspond to every different style of individual noses. More desirably, each implant is carved for each patient before and during the operation.⁶

The L-shaped silicone implant has been widely used in Asian countries. One of the major advantages of this silicone implant is a smooth and undisturbed nasal dorsal contour from radix to nasal tip. With the L-shaped silicone implant, augmentation of both the nasal dorsum and the tip is accomplished concurrently without complicated tip procedures.

The L-shaped silicone may be an attractive choice for Asian patients because of extreme difficulties of tip plasty in the Asian patient with weak septum, small and weak cartilaginous framework with short medial crura, and thick soft tissue envelope.

However, drawbacks of the L-shaped silicone implant are apparent.

First, risk of tip skin problem, such as extrusion, is high, especially when the implant is excessively long, or the tension on the tip exerted by the implant is high. The implant can extrude through the tip skin or through the membranous septum (**Fig. 1**). Even an implant with a short vertical segment, such as the "bird-shaped" implant, may extrude, because in many cases, those implants are long enough to be in direct contact with the tip skin.

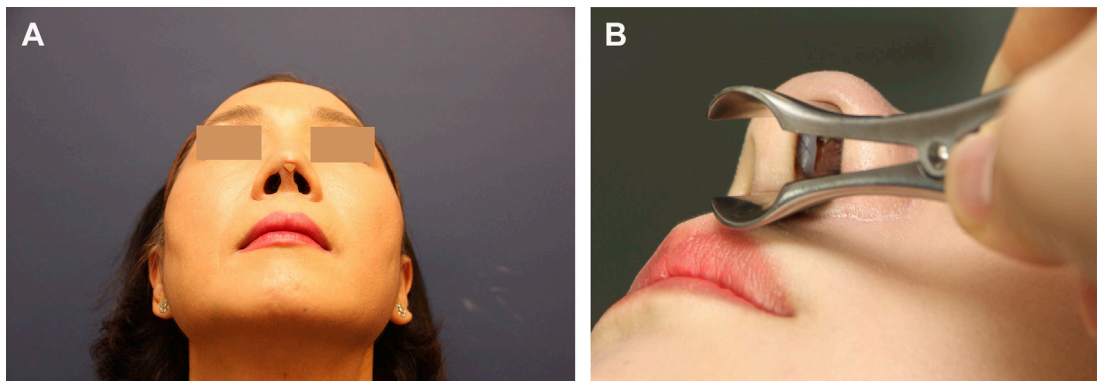


Fig. 1. The implant can extrude through the tip skin or through the membranous septum.

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