Contracted Nose: My Preferred Technique

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Introduction

In rhinoplasty, a short, contracted nose is a quite unique and common complication, especially in Asians, although it also develops in a Caucasian nose.

Most short nose development in an Asian nose is related to use of an alloplastic implant. Another contributing factor is a recent obsession of Asians for tip surgery. Patients want a more projected tip, which often leads to aggressive manipulations of tip cartilage and caudal septum. Failure to adequately control tip projection and rotation, repeated revisions due to esthetic dissatisfaction, and indiscreet use of alloplastic material on the tip area all contribute to the increased development of a short, contracted nose in Asian persons.

Correction of this deformity is challenging for various reasons. First, the causes for development are complex. Patients typically have multiple surgery histories with multiple manipulations of the tip and the dorsum. Second, all three components of the nose (skin envelope, cartilaginous framework, and inner lining) are involved and damaged. Septum is weak, lower lateral cartilages are rudimentary, scarring is severe, and the skin is hard. Third, not only tip rotation, but also dorsum augmentation is necessary in most patients with a short nose deformity.

This chapter discusses the pathogenesis, evaluation, timing and strategy of surgery, and surgical techniques. All information presented was acquired through the author's 25 years of learning, teaching, and practice of rhinoplasty. I sincerely hope rhinoplasty surgeons will benefit from this presentation to prevent and treat the short, contracted nose in their daily practice.

Pathogenesis of a Short, Contracted Nose

The pathogenesis of a contracted, short nose is not well known. Acute development of a short nose after surgery is mainly due to overzealous augmentation of the tip without considering the vector of the tip projection. It is due to an esthetic misjudgment on the part of the surgeon or the patients themselves wanting an overly-projected tip without considering the overall harmony of the nose. Short nose development due to over resection of tip cartilage is rather rare in Asian countries.

From the author's experience, a typical contracted, short nose has two clear time frames, subacute vs. chronic. The subacute cause of contraction is an infection of an alloplast implanted nose. Patients clearly say that their noses became short and upturned in a relatively short time

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period after an infection. This contraction process is a kind of subacute process, occurring in the months after certain events. Surgery on these patients shows abundant, thick scar tissue around the implant with a meltdown or flimsy lower lateral cartilages.

Chronic short nose development is presumed to be caused by silicone capsular contraction or a dormant infection around the silicone implant. Over the years, after silicone insertion on the dorsum, the tip slowly becomes upturned with skin contraction. It can take several months or years to develop a shortening of the nose. No clear infection history can be found, however, a detailed history taking often reveals recurrent swelling around the implanted dorsum. This indicates a recurrent, dormant inflammation, which does not cause a clear purulent infection, and can be an underlying cause of chronic short nose development. Revision on these cases often reveals weak, necrotic lower lateral cartilage due to long-term pressure from the implant and scarring along with thin fibrous capsules around the implant.

As contraction progresses, the soft nasal tip becomes constricted and a so-called snub nose develops (Fig. 1). The nose is characterized by a decrease in nasal length with an exaggerated nostril shown from the frontal view. The tip is rotated cephalically and the columella is retracted with a more obtuse nasolabial angle on the lateral view. The deep nasofrontal angle that is formed after the removal of an implant makes the nose appear even shorter. Another cause for chronic short nose development is multiple traumatic revision rhinoplasties in a relatively short time period. Repeated traumatic elevation of the skin flap and damage of the framework cartilage cause the skin contract, the tip collapse with slow development of a short nose. Often caudal septum loss, septal perforation, or vestibular stenosis is combined. In many patients, short, contracted nose develops due to combination of repeated, traumatic revi-

Fig. 1 Typical contracted, short nose developed after silicone rhinoplasty 30 years ago. This 67-year-old female still has a silicone implant on the dorsum but her tip shows excessive nostril show in frontal view and severely retruded columella with obtuse nasolabial angle in lateral view

sion and the implant-related problems such as infection.

Most postoperative contracted, short noses have both structural problems, such as weak alar cartilage, and decreased skin compliance caused by a damaged skin–soft tissue envelope. These framework and skin envelope problems can hamper efforts to lengthen the nasal tip.

Patient Evaluation

Understanding the etiology, evaluating the anatomic peculiarities, and patient's level of expectations are the most important factors to take into account at the initial consultation of a patient seeking correction of a short, contracted nose.

It is important to try to obtain as much information about previous operations as possible: the kind of surgery the patient had, the type of implant used, the number of previous surgeries, and specific problems that were present such as infection. Getting a patient's preoperative photos helps to predict the surgical results.

Surgeons run into unpredictable situations in revising a short nose despite careful planning. The anatomic structure has often changed significantly and markedly differs from what was initially expected. This is especially true when an alloplastic implant related infection has occurred. Tip cartilages are deformed, or sometimes missing due to previous manipulations, necrosis by infection, or by pressure necrosis (Fig. 2). Often the upper lateral cartilages are also weak and collapsed causing a narrow airway with a saddle deformity.

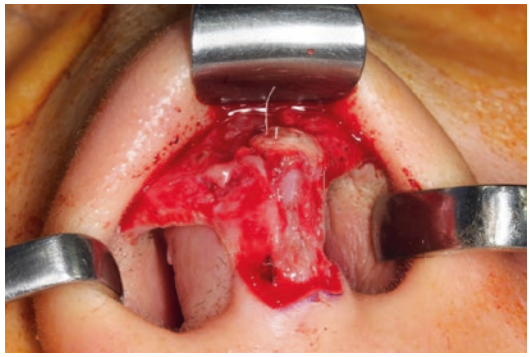

Fig. 2 Right intermediate and lateral crus were destroyed due to infection and pressure necrosis

Experience in and understanding of common rhinoplasty techniques or materials currently used by other rhinoplasty surgeons or clinic is also important. The surgical records of referred patients are often too simple and do not give full information on the procedures of previous surgery.

When examining the nose, first check skin quality and note its thickness, character, and elasticity and any damage. Hard, thick, fixed, inelastic skin with a foreshortened nose has a high tendency to have a less than ideal result. On the contrary, elastic skin over a mobile alloplastic implant gives a better surgical result.

If any implant is already on the nose, which is quite common in Asian countries, a dorsal implant needs to be palpated to check for size, position, and mobility. Sometimes an implant tip is protruding into the vestibular skin with painful tenderness. If there are any skin eruptions with crusting on the vestibular skin, remove the crust and wash the wound carefully. While squeezing on the dorsum, pus or serous discharge can come out from the skin defect, which means an infection of the implant.

Take a nasal bone X-ray to evaluate implant position, length, thickness, and skin thickness or to find any other foreign materials inside the nose (Fig. 3). Silicone or Gore-Tex can sometimes be found on the dorsum, while the tip area can show other shadows that the patient did not tell you or does not know about. In many cases, the patient does not know exactly what kind of material they have in their nose. Even the operation record from a previous surgeon is often not obtainable due to many causes, so the information on the previous surgery is often very limited.

Tip rotation and projection, tip cartilage size, position, support, columellar-lobular ratio are assessed. Septum and ear cartilage status is assessed. Ear cartilage is an important source of composite graft that may be needed to cover the vestibular defect. Often they were already harvested in previous surgeries, so careful palpation of the available source of ear cartilage is very important.

The condition of the nasal septum and turbinates is examined using anterior rhinoscopy and/or an endoscope. The presence of any synechiae should

Fig. 3 Nasal bone X-ray shows an I-shaped silicone implant on the nose. The tip is upturned, while the radix is high due to silicone implant

be noted. The nasal septum should be palpated with a cotton swab to check whether any cartilage remains. Nasal endoscopy enables the surgeon to check the septal perforation, any synechiae, and the status of the internal nasal valve, unlike doing anterior rhinoscopy alone, which sometimes does not allow full visualization of the nasal airway.

Maintaining a good relationship with the patient is important. Pay close attention to the patient's problems, identify possible causes, and advise potential solutions. When the patient's expectations are not realistic or if the patient's complaints are different from the problems that you observe, it is wise to delay the operation or ask the patient to find another surgeon to perform the secondary rhinoplasty.

Timing of Revision Rhinoplasty

Timing of revision surgery for a short, contracted nose differs from case to case. Many surgeons and patients mention a one-year rule in revision rhinoplasty, meaning waiting at least a year before attempting surgery.

If the short, upturned nose developed after primary surgery without using any implant or previous silicone removal, at least a year is necessary before starting any revision. Scar maturation and softening of the skin envelope needs at least a year, thus correction within a year may have a limitation in lengthening the nose due to inelastic skin.

However, if a short, contracted nose has developed with any alloplastic implant on the dorsum, the timing of surgery varies according to the individual situation.

When there is no infection on the nose, it is advantageous to elongate the nose together with removal of the implant, because the already enlarged nasal soft tissue envelope easily adapts to an elongated structure. Immediate reconstruction also has advantages such as reduced social downtime, avoidance of multiple surgeries, and less surgical expense. It can also eliminate the psychological stress caused by the dramatic nasal shape difference after alloplast removal.

However, when there is an infection in alloplast together with a short nose, deciding the time of revision surgery requires a few considerations. Immediate reconstruction carries an increased chance for reinfection even when using an autologous tissue. Furthermore, the patient may have damaged, scarred, swollen skin, thus, it becomes more challenging to predict an exact shape, and makes it difficult to create an esthetically fine-tuned nose shape during the reconstruction. Therefore, the surgeon needs to consider all these factors when determining the best timing for reconstruction.

In my experience, reconstruction with the patient's own cartilage is safe even if the surgery is simultaneously carried out with the removal of an infected implant and inflamed tissue (Figs. 19, 20, and 21). Although subsequent re-creation of a perfectly shaped nose can be challenging, filling up the space created by the previous implant can prevent contraction of the wound, laying the groundwork for further revision and improvement. The patient must be well supported psychologically in case further secondary rhinoplasty is required later. In patients who stick to a perfect nose shape after removal of infected alloplast, it

is wise to delay the esthetic reconstruction after alloplast removal.

Materials and Approach

Correcting a short, contracted nose requires a large quantity of graft materials for structural support and volume replacement. Although surgeons agree that structural reinforcement needs autologous tissue, alloplast is commonly used for dorsal volume replacement. I prefer autologous cartilage even for dorsal work to prevent potential complications such as infection or soft tissue contraction. Although septal and ear cartilage are the first choice of graft material for minor corrections, rib cartilage is mostly needed when considering a deficient structural framework and the amount of cartilage to modify the tip.

I rarely use homologous grafts, because they are fragile to carve, and need thicker pieces to resist the same skin tension compared to an autologous piece. This often makes the caudal septum thick and causes nasal obstruction. Most of all, grafted homologous rib cartilage is unpredictable in maintaining the dorsal volume due to long-term resorption.

In patients with problems of the skin–soft tissue envelope, temporalis fascia, rib perichondrium, mastoid periosteum, or autologous dermis are used to reinforce skin that may have been overly thinned or damaged. Loose fat tissue from the rib harvest site helps to fill the void skin–soft tissue envelope and helps to prevent long-term skin thinning and recurrence of skin contracture (Fig. 4). A product of homologous fascia or homologous dermis from cadaver skin (Alloderm, Surederm) can be feasible alternatives.

Artificial implants are generally not used to correct a short nose deformity, but they can be used if the patient understands and agrees to the risk of complications and has relatively thick skin with no demonstrable infection. If an alloplast is used in revision, its use is strictly confined to only augment the dorsum.

I use a closed approach when the short nose deformity is not severe and only slight tip grafting is necessary to correct it. When significant structural reconstruction of the septum and tip are needed, an open approach is necessary to ensure sufficient visualization and manipulation of the structures.

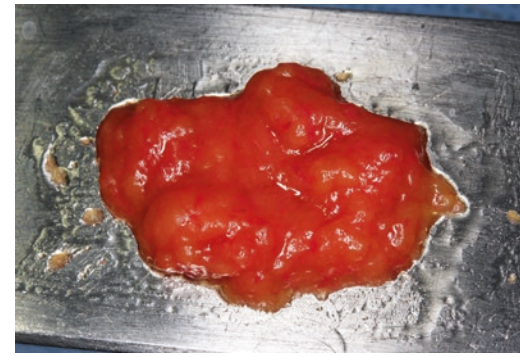

Fig. 4 Loose soft tissue harvested from the chest. Filling the dead space between the cartilage graft and thinned, damaged skin with this tissue helps to heal the skin and to prevent recontraction

Opening a nose in Asian secondary rhinoplasty is like opening a box of chocolates, and you will never know what you are going to get till you open it. Securing good vision with sufficient graft material is a prerequisite to allow a surgeon to improvise when encountering an unexpected situation.

Strategies for Correction

The main surgical goals are caudal rotation of the tip-defining point. Dorsal elevation helps to give an illusion of nasal lengthening, especially in patients with a low-profile nose.

Caudal rotation of the tip-defining point is obtained by caudally readjusting the lower lateral cartilage on the septal extension graft with or without additional onlay tip grafts. The lower lateral cartilages are weak or missing due to necrosis and reconstructing the tip cartilage is necessary.

Because stretching the contracted skin is limited, achieving both caudal rotation and projection increase is often difficult. When a considerable amount of caudal rotation is needed, I need to tell the patient that tip projection needs to be lower than compared to the current nose.

To caudally rotate the tip and maintain the projection against redraped skin tension, a firm structural support reinforcing and lengthening all three legs of the "tripod" of the nasal tip is needed. Even minor derotation of the tip needs a considerable amount of work under the contracted skin.

When the central part of the nose (the columella and the tip lobule) is lengthened with a septal extension graft, the lateral crus is prone to realign in a more vertical direction. The alar margins also need to be lowered to create a more balanced nostril after the septal extension graft is placed. A slight imbalance can be adjusted with a lateral crus onlay or lateral crural strut grafts.

Placing a long lateral crural strut graft and relocating the lateral crural complex into a pocket made in the piriform aperture may lower the alar margin in thin-skinned white patients, but this maneuver is not as effective for Asians who have thicker skin. A stiff and inelastic skin envelope and deficient vestibular skin are the most commonly encountered limiting factors to lowering the alar rim.

Often, the dissected skin–soft envelope can be draped to the new septal extension graft, but the internal vestibular mucosa does not follow the elongated envelope, resulting in a gap, especially at the alar rim margin. I prefer to use a conchal composite graft from the cymba concha to fill the gap, so that alar margin lifting does not occur due to scar contracture.

Surgical Techniques

Rib Cartilage Harvesting and Carving

The availability and status of the rib cartilage are preoperatively assessed with a rib series X-ray (Fig. 5). The images show the presence, type and degree of calcification, shape, and size of the rib cartilage. Thus, the surgeon can easily decide before surgery whether rib cartilage is available or not and which cartilage is best suitable for harvesting.

Costal cartilage is commonly harvested from the sixth or seventh rib. The incision is made directly over the chosen rib in male patients and just above the infra-mammary crease in female patients to conceal the chest scar. The size of the incision may vary but is usually less than 1.5 cm in length in thin-skinned patients and 2-3 cm in thick-skinned patients. The costochondral junction is located by performing serial puncture with a 26-gauge needle for precise placement of the incision. The skin and subcutaneous tissue are incised with a no. 10 blade, and the subcutaneous tissue is retracted using retractors until the external oblique muscles are exposed. Instead of cutting with a Bovie, the muscle fibers are separated with mosquito forceps and retracted with a Senn retractor, which can minimize postoperative pain. After adequate exposure, two parallel incisions are made along the superior and inferior borders of the rib cartilage, leaving an intact central strip of perichondrium on the anterior surface. Several small incisions are made perpendicular to the longitudinal incision to facilitate reflection of the perichondrium.

Harvesting is facilitated by performing a medial cut before completing the dissection of the posterior surface of the costal cartilage. The

Fig. 5 Rib series X-ray shows almost totally calcified rib cartilage. This type of rib cartilage cannot be used for short nose correction, which requires enough cartilage for structural graft

initial incision is made with a blade and the cartilage cut is completed with a Freer elevator to avoid inadvertent pleural injury. After the lateral cut, a small two-pronged retractor is used to pull the costal cartilage and expose the posterior surface. The perichondrium of the posterior surface is dissected with a curved elevator and the cartilage is taken out. Typically, a 3-4 cm piece of costal cartilage can be harvested together with the central strip of perichondrium. When necessary, the cartilaginous cut can be extended up to the synchondrosis portion to obtain a longer graft.

Testing for air leakage is performed by filling the dissection pocket with saline and performing positive-pressure hyperventilation. If no air leakage is confirmed, the donor site is packed with antibiotic-soaked gauze until the end of the operation. As such, extra cartilage can be harvested during the operation or remnant cartilage can be reinserted for future use.

If pleural tears are excluded intraoperatively, a postoperative chest X-ray is not routinely performed. However, it should be performed if the patient develops respiratory signs and symptoms.

After harvesting, the rib cartilage is carved for various grafts. Commonly needed grafts in short nose correction are septal replacement graft, septal extension graft, extended spreader grafts, septal splinting/batten graft, lateral crural onlay/strut grafts, and dorsal augmentation graft. These kinds of structural supporting grafts are best carved from a sagittal split, leaving both cortical ends at both sides of a core (Fig. 6). Carving is modified strategically according to the necessary graft shape and size.

Thin and naturally straight pieces of cartilage such as the septal cartilage are best for septal extension grafts. However, a certain degree of cartilage bending or warping is unavoidable in rib cartilage carving, thus strategic use of bent cartilage is needed. For example, in designing extended spreader grafts, an affected fragment can be split in half and used bilaterally, compensating for the curvature.

For minor dorsal augmentation, either thin cortical cartilage or longitudinally sectioned cartilage is used while major dorsal augmentation needs grafts carved from the center of the rib cartilage or layering of longitudinally sectioned, thin cartilages.

Skin Dissection

Wide dissection of the skin–soft tissue envelope is important to allow maximal stretching of the skin when it is redraped. Releasing the skin from underlying scar tissue needs extreme caution to prevent incidental skin damage. First, the skin on the lateral crura is dissected, then cartilaginous and bony dorsum are dissected. From the bony dorsum, lateral dorsal skin dissection with a 15-blade starts and comes down to the upper lateral cartilage. The lateral dissection margin goes down to the nasofacial junction. Release of lateral crus to the piriform aperture is done follow-

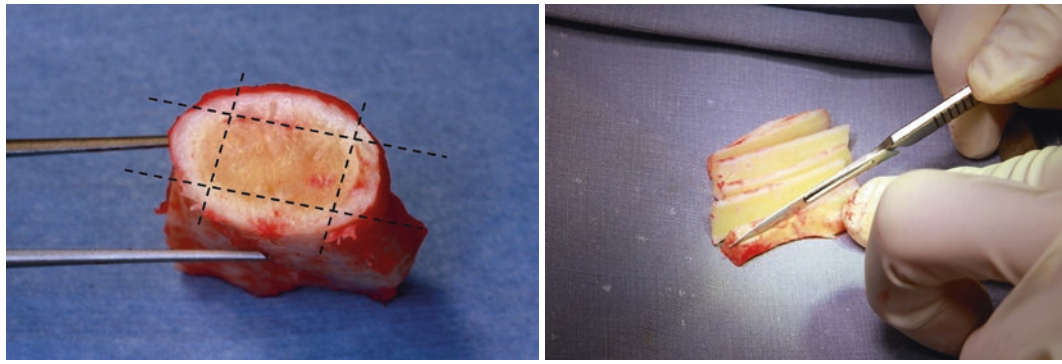

Fig. 6 Longitudinal sectioning of rib cartilage leaving equal amounts of cortex on both sides prevents warping of the carved cartilage

ing dorsal skin dissection. Thick scars need to be excised or released to make the skin more flexible and easily manipulated.

When silicone is removed, anterior and posterior capsules need to be moved.

A posterior capsule hinders stable fixation of cartilage grafts on the nasal dorsum. An anterior capsule is often very thick, especially when there are histories of infection. Dorsal skin is inelastic when the thick capsule is attached, thus lengthening is difficult without removing the capsule.

If the dissected skin is thick and wound closure leaves considerable tension even after removal of scar tissue and the silicone capsule, the dorsal skin is lengthened using multiple horizontal hatching incisions underneath. These cuts are only made on the scarred subcutaneous tissue, not on the dermis.

Building Structures to Lengthen the Tip

The septum acts as a strong structure to hold and keep the supporting structure to reposition and fix the lower lateral cartilages. After dividing the lower lateral cartilage and elevating the submucoperichondrial flap, the septum is observed first. The septal flap elevation needs to be minimized to the level where grafts are placed and fixed unless you plan to correct the deviated septum.

Caudal and dorsal septal stability is of utmost importance for a stable septal extension graft. Any deviation of the L-strut needs to be corrected before adding grafts on the septum (Fig. 7). If the caudal septum is weak, it should first be stabilized. Meticulous strong suture fixation of the posterior septal angle to the anterior nasal spine is necessary when this junction is unstable.

An overlapping (side-to-side) septal extension graft or an end-to-end septal extension graft is necessary to reposition the lower lateral cartilage (Fig. 8). If the remaining L-strut is not stable, the septal extension graft fails to resist the skin tension and is prone to twist or deviate, thus it is necessary to reinforce the L-strut and septal extension graft.

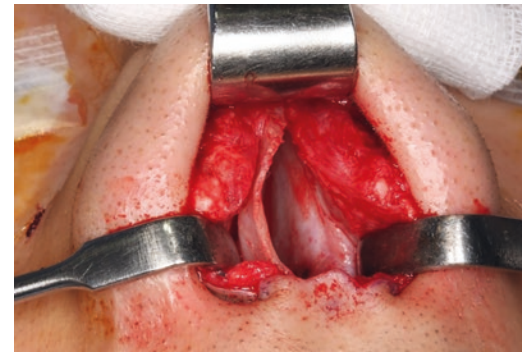

Fig. 7 Deviation and stability of the caudal septum is observed. If there is any deviation, it should be fixed first before adding any grafts on the septum

Reinforcement of the septal extension graft is usually done by applying extended spreader grafts because the dorsal border of the septum is quite stable (Fig. 9). For end-to-end septal extension graft, the grafts are further stabilized at the base with a thin strip of splinting grafts to prevent distortion (Fig. 10).

When applying the side-to-side septal extension graft, the graft is designed to reach the nasal floor unless the junction of the posterior septal angle and anterior nasal spine is stable and the septum–graft complex is suture-fixed to the anterior nasal spine.

Release of Lower Lateral Cartilage

The lower lateral cartilage is released from the upper lateral cartilage and piriform aperture and repositioned on the new grafted septal extension graft (Fig. 11). A lengthening effect can be obtained by lowering the nasal tip and rotating it caudally. Care needs to be taken not to tear the underlying nasal mucosa when dissecting the lower lateral cartilage from the joining upper lateral cartilage.

Lateral crural strut grafts (Fig. 12) help to reposition the lower lateral cartilage to a more caudal position, to strengthen the alar to prevent pinching or collapse, thus making the tip shape more natural. Many Asians have a thick tip skin while the cartilages are weak, and in comparison,

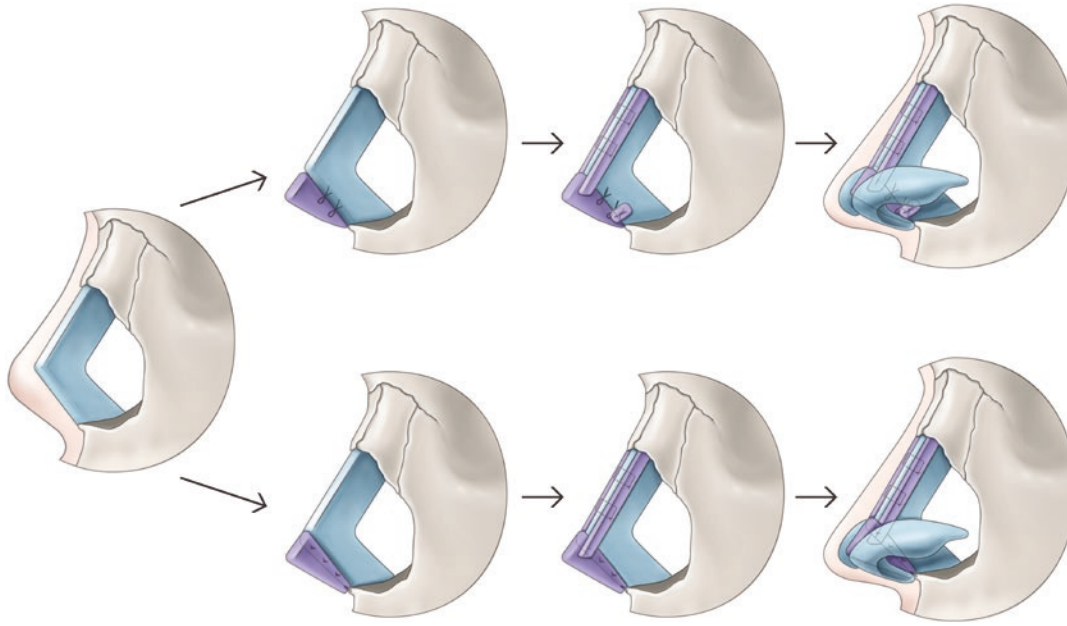

Fig. 8 Two patterns of septal extension grafts: a side-to-side and an end-to-end type

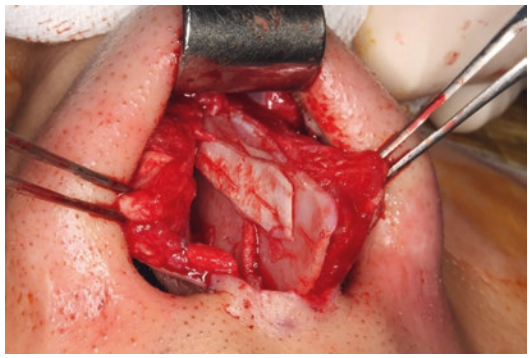

Fig. 9 Note the side-to-side (overlapping) septal extension graft on the left side of caudal septum and both extended spreader grafts reinforcing the graft

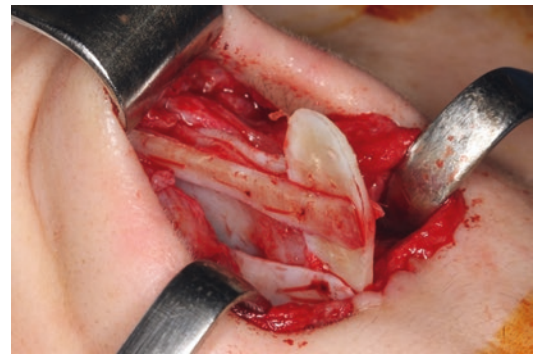

Fig. 10 An end-to-end septal extension graft before final carving strengthened by extended spreader grafts above and thin splinting grafts below (arrow)

a lateral crural strut is not as often necessary as in Caucasians.

Often lower lateral cartilages are rudimentary and all scarred. In this case, it is better not to dissect the lower lateral cartilage from the underlying mucosa. Instead, adding cartilage on top of the lateral crus and using a composite graft to bridge the gap between the external skin and vestibular skin is more beneficial.

Additional Lengthening

Additional lengthening of the tip can be gained through the use of various grafts on the newly positioned lower lateral cartilage. Shield grafts and cap grafts are commonly used (Fig. 13).

Lateral crural onlay grafts are placed to reinforce weak lateral crura (Fig. 13). If a significant amount of rotation and projection of the nasal tip

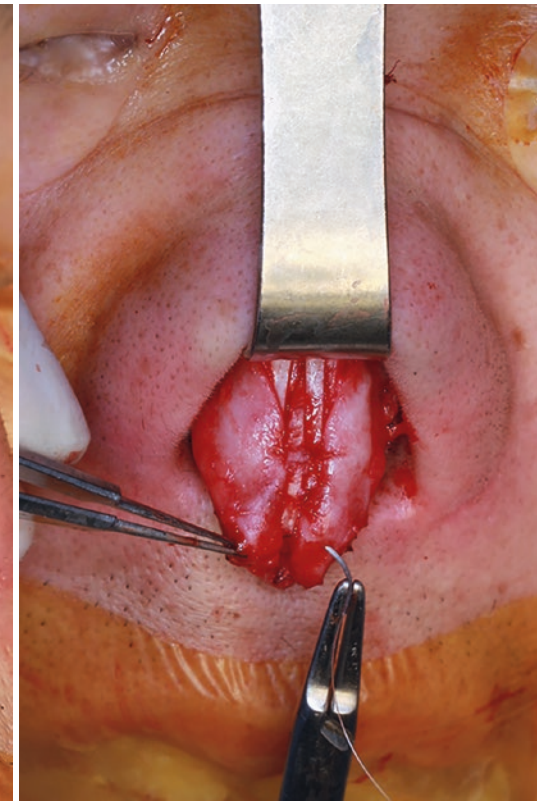

Fig. 11 Released lower lateral cartilages are pulled caudally and secured to the septal extension graft with sutures

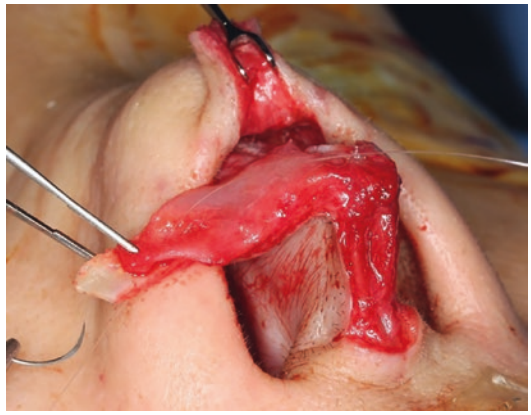

Fig. 12 Lateral crural strut grafts strengthen the weak alar wall and reposition the lateral crus into a more ideal position, thus help to lengthen the short tip

Fig. 13 Lateral crural onlay graft helps to strengthen the weak, flail lateral crus. Tip onlay graft is done to lengthen the tip more

were achieved, the alar margin can appear unnatural, slightly retracted, or collapsed. Alar contour grafts can be used to provide a smoother natural continuation from the nasal tip to the alar margin.

Dorsal Augmentation

A dorsal onlay graft is used when the dorsal height needs augmentation to match the elongated and projected nasal tip. Dorsal onlay grafts can be extended to include the nasion to make the dorsum higher and the nose appear longer. If you

augment the dorsum too high, the skin envelope available to the tip lengthening would be limited, so an optimal plan considering ideal dorsal and tip position should be implemented to effectively redistribute the skin.

Augmenting the dorsum using cartilage needs a whole chapter for detailed surgical information, thus it will be dealt with separately.

Closure of Wound

When closing the wound, there should be no or little tension on the wound margin. Skin closure that is too tight can result in a noticeable scar, wound dehiscence, or even skin necrosis.

When short nasal skin is elongated and redraped over the lengthened framework, a supratip fullness can remain after skin closure (Fig. 14). This is caused by difficulty from a previously highly projected tip skin to sink down to redrape the lower supratip area because of long-time molding. A single supratip suture anchoring molded skin on the supratip area helps to flatten that area and to obtain a better profile view.

The septal mucosal flap and vestibular skin are moved forward and upwards by dissection to match the elongated skin envelope. However, sometimes the lengthened skin and vestibular skin cannot be primarily closed. If this gap is not filled, the alar rim may retract due to scar contracture and a balanced lowering of the central and lateral parts of the tip is not possible.

A chondrocutaneous composite graft taken from the cymba concha is prudently used to fill the gap, especially in area of the soft tissue triangle. Before primary closure of the columella, the caudal part of the conchal composite graft is first sutured at the infracartilaginous incision, then the cephalic part is sutured to the vestibular

Fig. 14 Supratip fullness (arrow) after short nose correction. Presurgical convex skin by long-term molding maintains its shape after redraping. Supratip suture helps to flatten this portion, while severe case needs skin excision

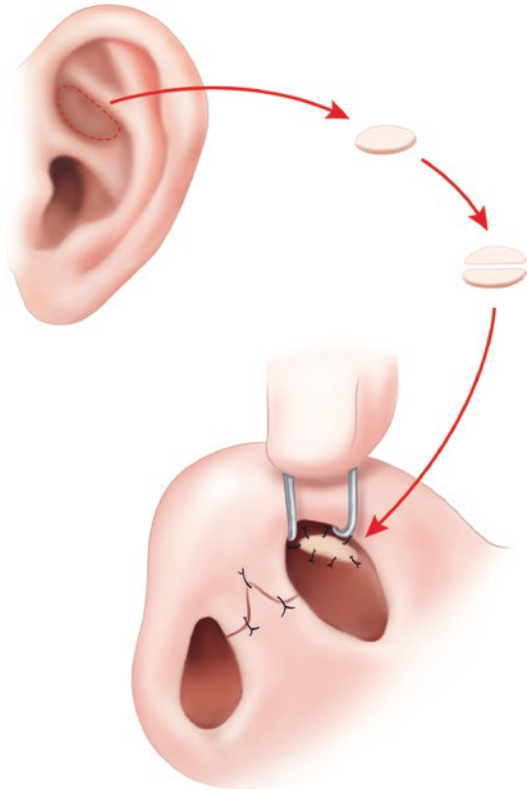

Fig. 15 A chondrocutaneous composite graft harvested from cymba concha is suture-fixed to fill the gap between the lengthened skin and the vestibular lining

skin to fill the defect (Fig. 15). After composite graft, silastic sheets are put under and over the grafted site to adapt the grafts to the vestibular skin.

Adding Soft Tissue to the Skin Envelope

When contracted skin quality is poor, recontraction occurs even with successful framework reconstruction and skin redraping. Poor blood supply on the stretched, damaged skin will eventually make the skin contract again. Extra work to strengthen and reinforce the damaged skin is necessary. A micro or nanofat infused temporalis fascia covering can be an alternative. Loose soft tissue from the chest covering the dead space and graft material helps to minimize skin contracture (Fig. 4). Infection risk can rise if soft tissue is covered on the grafts, so every effort should be made to decrease postoperative infection.

To prevent potential infection, IV antibiotics are used for 2-3 days after surgery. Thorough nasal dressing with betadine and anti-staphylococcal antibody ointment is necessary. When the blood supply is poor and the wound is insufficiently clean, a drain is placed inside the nasal flap and postoperative irrigation with antibiotic solution for 3-4 days helps to prevent potential infection.

Case 1

A 38-year-old woman visited a clinic for revision rhinoplasty. She previously had silicone rhinoplasty and had the implant removed due to infection. At the time of her visit, her nose showed typical short, contracted nose deformity: excessive nostril show from the frontal view, upturned tip and low dorsum and radix from the lateral view (Fig. 16).

Her rib cartilage was harvested and used for the tip lengthening and dorsum augmentation.

Skin was elevated widely and two layers of small cartilage grafts were removed from the tip.

Thick scar tissue on the tip area was removed. Multiple horizontal incisions were applied to the subcutaneous scar tissue to obtain a more flexible, released skin envelope at the tip and supratip area. An end-to-end type septal extension graft was placed at the edge of caudal septum using figure-of-eight sutures. This was reinforced using both a septal splinting graft at the base and partial extended spreader grafts on the dorsal side. The septum was minimally dissected to only allow placement of the reinforcing grafts. On the tip, a shield graft, bilateral lateral crural onlay graft, and tip onlay graft carved from the rib cartilage were used to obtain more lengthening and tip refinement (Fig. 17). Dorsal onlay graft was done with a carved, one-piece rib cartilage.

Fig. 16 Preoperative frontal and oblique views

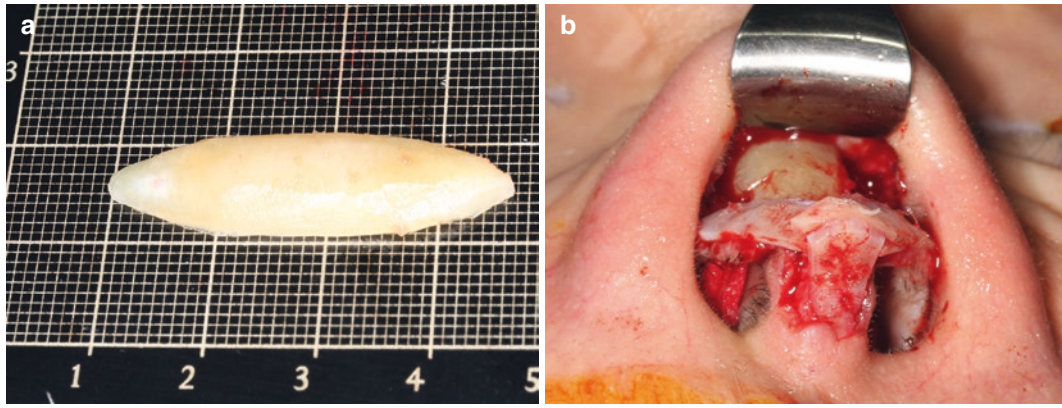

Fig. 17 (**a**) Boat shaped carved rib cartilage graft for dorsal augmentation. (**b**) Dorsal onlay graft, lateral crural onlay graft, shield and cap grafts are all carved with rib cartilage

Fig. 18 Two-year postoperative photos show a well augmented dorsum and harmonious tip shape

Two-year postoperative photos show an improved tip shape with naturally augmented dorsal profile. The upturned tip became normalized with a natural increase of her tip projection (Fig. 18).

Case 2

A 22-year-old women visited the clinic due to her short looking nose and nasal obstruction. She had augmentation rhinoplasty using silicone 4 years ago. On physical examination, her dorsal silicone looked deviated and her tip looked short, upturned (Fig. 19). Caudal septum was severely convex to the right side.

During the surgery, a considerable amount of yellow pus drained from the undersurface of the silicone implant (Fig. 20a). Silicone was removed with the capsule and the dorsum was thoroughly irrigated with necrotic tissue debridement. Right lateral crus was melt down probably due to the infection (Fig. 20b). Caudal septal deviation was corrected. Using harvested rib cartilage, septal extension graft was done and it was fixed with bilateral spreader grafts. Tip was repositioned to the new dome and dorsal onlay graft was done with two-layer rib graft (Fig. 20c). Right lateral crural graft and tip grafts were done for further tip modification (Fig. 20d).

After surgery, her nose looks natural and the tip does not look upturned anymore. Her dorsum is straight and dorsal height is optimal. She can breathe well through her nose (Fig. 21).

Case 3

A 66-year-old woman visited the clinic to correct her short looking nose (Fig. 22). She previously had a rhinoplasty using silicone about 30 years ago and her nose slowly became shortened. Currently, she has a large silicone implant on her nose (Fig. 23). Physical exam showed excessive nostril show with an upturned tip, too high radix, and contracted skin on her tip.

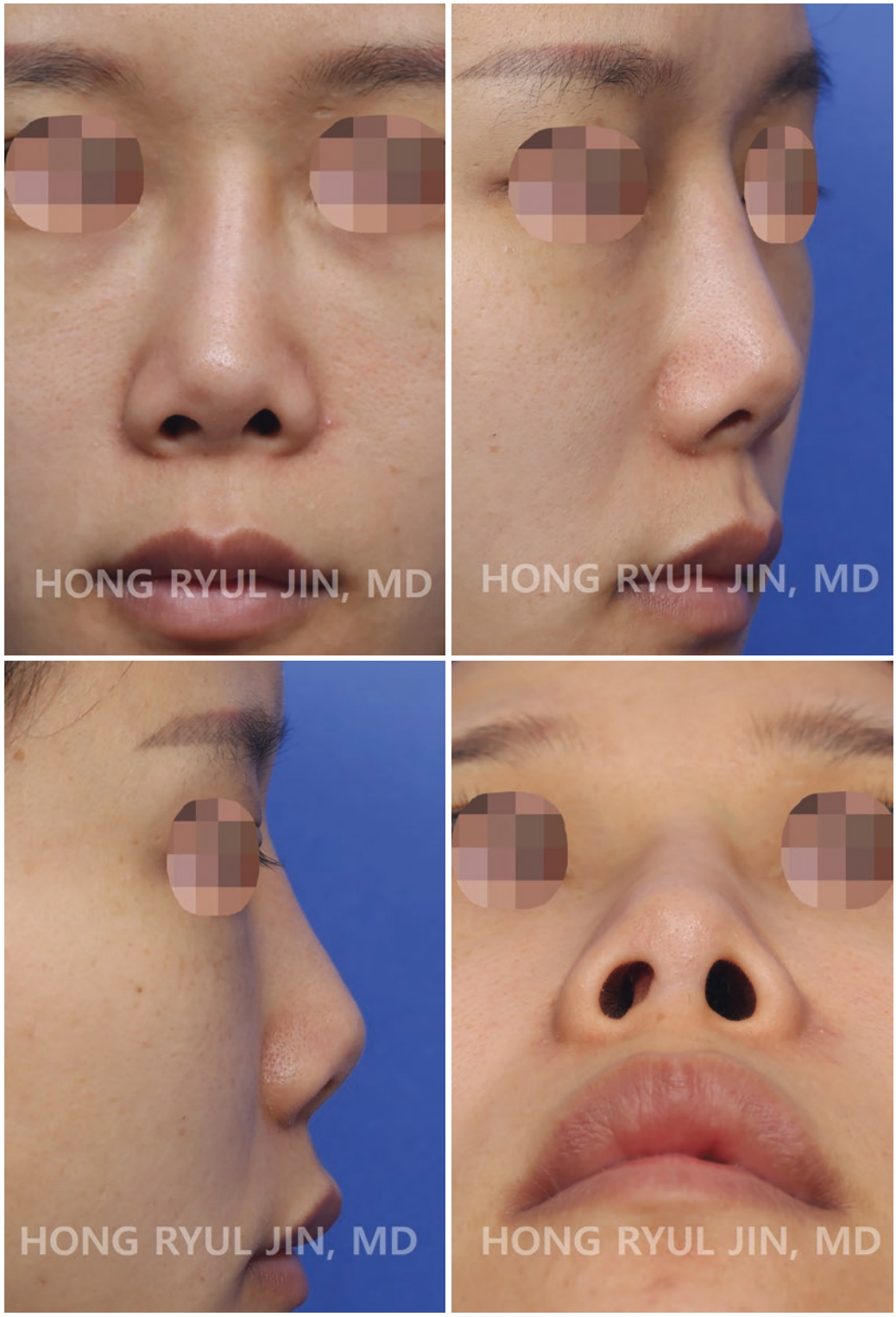

Fig. 19 Preoperative views. Deviated silicone implant and slight swelling of dorsum are observed. Tip is upturned with excessive nostril show. Silicone implant is seen from the nasal X-ray view

Fig. 13.19 (continued)

Surgery material included rib cartilage, loose soft tissue, and fat from her chest and cymba concha skin and cartilage composite tissue. After flap elevation, abundant scar tissue was removed from the dome and the lateral crus. From the dorsum, a large silicone implant was removed together with the capsule. After septal exploration, an end-to-end septal extension graft was applied and they were reinforced with extended spreader grafts on the dorsal border and splinting grafts at the bottom of the caudal septum. Lower lateral cartilages were released from the upper lateral cartilage and scar tissues, and moved into an elongated position using the septal extension graft. Domal and infradomal onlay grafts were added with rib cartilage and folded perichondrium. Both lateral crural onlay grafts were done with a thin sleeve of carved rib cartilage. Deficient dorsum was filled with carved rib cartilage, and diced rib cartilage/loose soft tissue mixture on top (Fig. 24). During the skin closure, the gap between the dorsal envelope and vestibular skin was filled with cymba conchal composite graft bilaterally.

Two months after surgery, her tip was rotated caudally and the retracted columella was normalized. Her radix was lowered while her dorsum maintained her preoperative height, which made the nose look natural (Fig. 25).

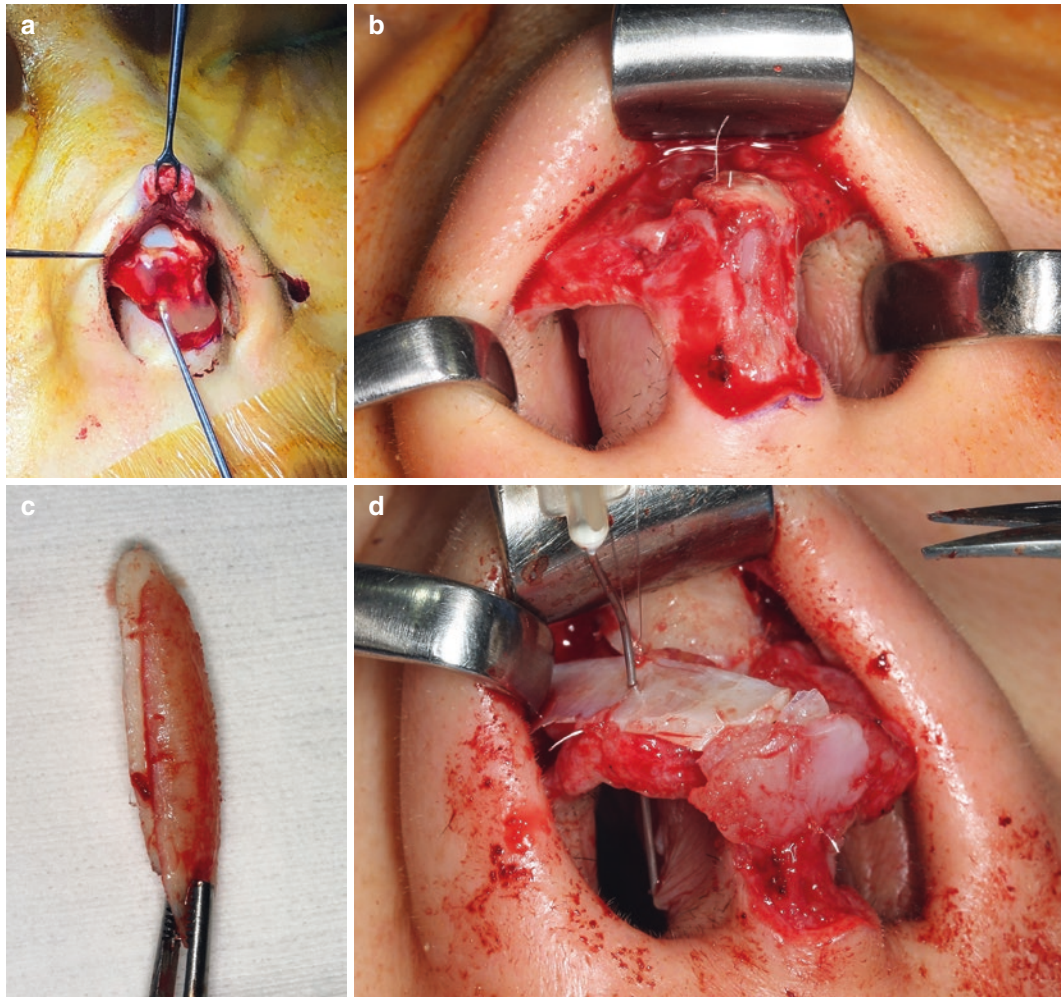

Fig. 20 (**a**) Yellow pus is draining from undersurface of the silicone implant when the nose is opened. (**b**) Right intermediate crus and lateral crus are missing due to infection necrosis. (**c**) A two-layer carved rib cartilage graft for the dorsum. (**d**) Right lateral crural restoration graft and tip grafts are in position for tip modification

Fig. 21 Two-month postoperative view shows a well healed, normal looking nose. Tip has been lowered considerably

Fig. 22 Preoperative views of a 66-year-old woman show short, contracted nose, upturned tip, and severely retruded columella

Fig. 23 Her nasal bone view shows a large silicone implant on the dorsum

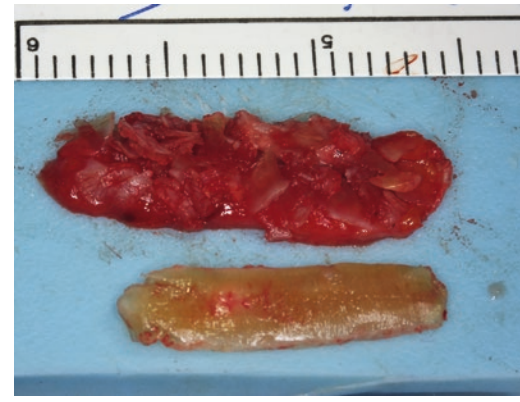

Fig. 24 Carved rib cartilage and diced costal cartilage wrapped with chest soft tissue for dorsal graft

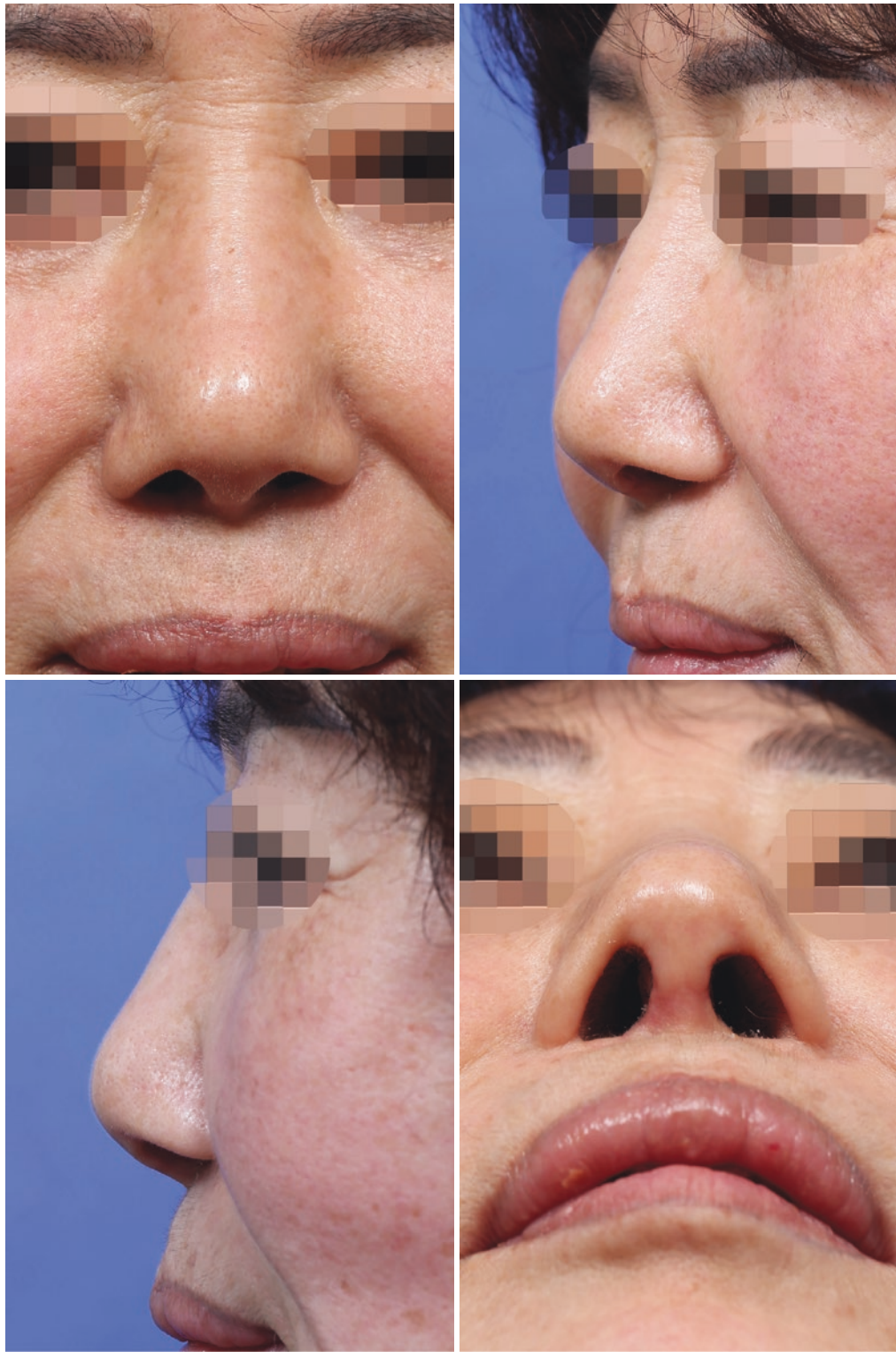

Fig. 25 Two-month postoperative views show a much improved nose shape. Dorsum is maintaining a normal height by replacing the silicone with rib cartilage, tip was rotated caudally, and the retracted columella gained the normal volume

Further Reading

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