CASE REPORT

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Two-stage revision cartilage septorhinoplasty in an Asian female patient with severe short and saddle-nose: a case report of difficult revision rhinoplasty

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ABSTRACT

Background: Iatrogenic short-nose and saddle-nose deformities due to previous alloplastic implants remain the most challenging secondary rhinoplasty, particularly among Asian patients. Cartilage framework reinforcement, dorsal augmentation, sufficient nasal tip projection, and proportional nasal length are considered essential for Asian features. This study aimed to elaborate on full rib and ear cartilage revision rhinoplasty in a patient with those problems.

Case Presentation: A difficult case of a 31-year-old female with short-saddle-nose deformity due to infected silicone implant rhinoplasty is presented. A history of nose filler and thread lift was also reported. We noted a short and under-projected nose, indented scarring, dorsal irregularities, retracted columella, severe septal losses, and high trans-columellar incision scars. We conducted two stages of revision: (1) Secondary septorhinoplasty with the seventh costal graft and right concha cartilage, then alar-plasty and (2) Tip-plasty and columellar shield graft with left concha cartilage. Anatomic improvements, complications, and patient satisfaction responses were documented. The improvement of nasal length (39-46-48 mm), nasal tip projection index (0.5-0.59-0.63), nasofrontal angle (150-137-137°), nasolabial angle (117-85-93°), columella-lobular angle (60-45-42°), columellar show (0-0.5-2 mm), and alar flare (4.5-2.6-2.3 mm) on the pre-operative, first, and second stage were noted. No sign of significant absorption and wrapping was observed in both stage.

Conclusions: Short and saddle-nose deformity is considered one of the most challenging issues in rhinoplasty surgery. This finding is expected to create grounded perspectives among the young surgeons, also well-balanced and sensible beliefs on the final results among the patients.

Keywords: Asian Nose, Ear Cartilage, Revision Septorhinoplasty, Rib Cartilage, Saddle-Nose.
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INTRODUCTION

Currently, rhinoplasty has been evolving as a popular surgery procedure among Asians.[1] Most Asian noses suffer from a bulbous tip, low radix, low dorsum, short columella, thick-less-palpable skin envelope, and a smaller or weaker cartilage framework.[2-4] Moreover, Asians possess a low nasal profile under the projected nasal tip, raised nostril show, and alar flaring that eventually contributes to a feminine appearance.[5] Commonly, cartilage framework reinforcement coupled with dorsal augmentation has been established as a paramount phase in a rhinoplasty procedure among Asians.[2-4] A saddle nose results from previous nasal injury or insufficient medical procedures. Therefore, weak septal cartilage reconstruction and reinforcement are the essential correction procedures in a short, saddle, and severely developed nose. A short nose is among the toughest challenges in rhinoplasty. It also seems more impenetrable due to the presence of saddle nose deformity. In the worst situation, this case mandates shape and function correction with the least amount of tissue to work with.[6,7] Weakened and damaged septal cartilage framework typically puts a risk to the occurrence of nasal deformities, particularly in saddle nose cases. A steady midline supporting structure would be rebuilt by the septal cartilage reinforcement and grafts to reform the nasal shape and improve its function.[8]

This report presented a saddle-Asian nose case due to previous iatrogenic deformity from the infected alloplastic huge L-implants. The soft tissue contracture yielded by the capsule formation around the nasal retraction would aggravate the nasal retraction.[9-11] Retractions were also noted and may possess worse outcomes because of the infection. The septal extension graft (SEG), spreader graft, columellar strut graft, and derotation graft were often advised to acquire sufficient nasal tip projection and length simultaneously.[12-18] Septal cartilage is a typical source of support used in the SEG procedure due to its hardy characteristic. Unfortunately, most Asians own insufficient septal cartilage structures

to meet the procedure prerequisites.[17] Auricular cartilage delivers weaker strength than costal cartilage that may not be adequate for severe short, bulbous, and saddle noses correction procedures.

The abundance and versatility of the autologous costal cartilage graft permit the derivation of a wide range of grafts. However, this grafting technique has been constantly associated with complications, including warping, infection, and displacement, as well as donor-site morbidity issues such as pneumothorax, higher pain levels, and chest scars.[19-22]

Mastering septorhinoplasty in both primary and secondary cases is a constant learning process, as each case provides miscellaneous anatomy structures and proportions. The surgical manoeuvres selected should have been tailored to the individual conditions. Thereby placing the decision-making process of a correct surgical technique as the most challenging subject in septorhinoplasty. Several surgical techniques with different benefits and risks could be proposed for a case. However, the surgeon's picks should have highly depended on individual preferences and the patient's needs. The technique would also be essential in the final result of the procedure. The most trivial thing, over-or-undertreatment, may lead to undesirable results. Even, in some chances, unpleasant results could appear when a technique seems sufficient for the case.

The surgical technique employed in the recent study technically demanded a long learning process. The outcome would improve the patient's nasal breathing and social life. However, it also could harbour numerous pitfalls and sequelae that range from insignificant to damaging defects. This procedure required an adequate level of understanding of the nasal anatomy and the short to long-term implications of each manoeuvre or grafting during the procedure. Thus, this study aimed to report our technique's function and aesthetic outcomes, costal cartilage, by three-dimensional anthropometric analysis in a secondary saddle Asian nose case.

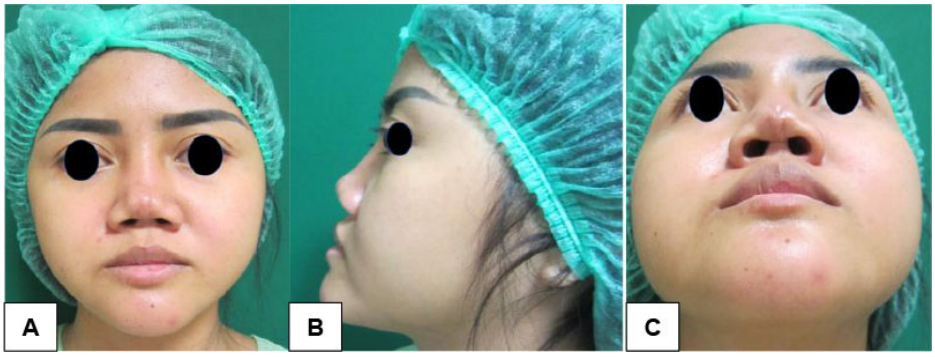

Figure 1. (A) Pre-operative frontal view shows a clover leaf deformity on the nose tip, effacement of the tip defining points, overly wide middle vault, and overly wide radix. Skin discolouration was also observed; (B) Pre-operative lateral left view shows the deprojected tip, short nose, over-rotated tip, and alar pinching; (C) Pre-operative basal view shows a clover leaf deformity, tip lobule impression/indentation, alar flaring, high scar incision, and nostrils asymmetry.

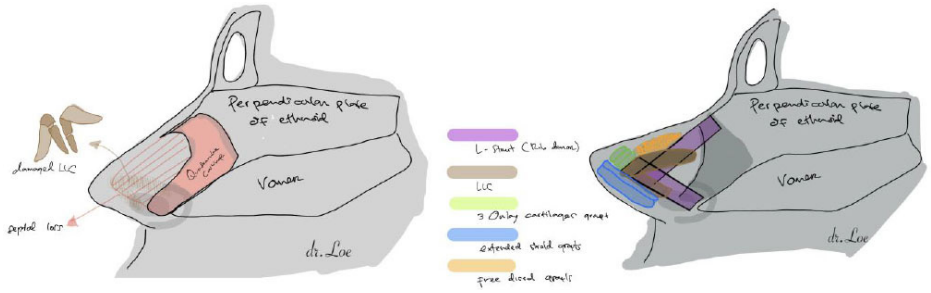

Figure 2. Illustration of the first-stage surgical procedure.

CASE PRESENTATION

Presentation And Medical History

A 31-year-old woman with a type 3 saddle Asian nose was referred for a secondary rhinoplasty procedure. She had a history of unsuccessful prosthetic nasal reconstruction procedures due to the infection. We noticed a contracture and upward malposition of a preexisting infected L- type silicone implant, a short and under-projected nose, indented scarrings, dorsal depression and irregularities, clover leaf deformity and overrotation of the tip, retracted columella, severe septal losses, alar flaring, and high trans-columellar incision scars. There was also an alar pinching on the left side of the nose. The collapsed external and internal valve was also spotted (Figure 1a-c). No other medical conditions were declared. A nose filler and thread lift history were confirmed. She also stated her smoking habit and the occurrence of nasal obstruction symptoms. She asked for nose revisions and ideal Asian noses.

Presurgical Consultation

Initially, we did an L-implant removal procedure at an outpatient clinic and prescribed oral antibiotics. Local anaesthetic was administered to conduct this removal procedure. The implant was carefully pulled, followed by NaCl (one litre) and povidone-iodine (500 ml) irrigation. The wound was left open and closed with gentamycin tulle dressing gauze. We also organized two stages of revision to correct the patient's nasal profile: (1) secondary rhinoplasty with the sixth costal graft and right concha cartilage and bilateral alarplasty and (2) extended tip-plasty and columellar shield graft with the left concha cartilage. We also directed consultation sessions with the patient and her relatives. The revision surgery complexity and the specific procedures required were communicated. We discussed the need for rib cartilage and concha cartilage harvesting to reconstruct the cartilaginous nose framework and tip projection. The sensible expectation for the final aesthetic and function after the surgery were also explained. We stressed the existing damage, skin contractures, soft tissue envelope (SSTE) shortening, and the difficulty in forecasting the effect of the

Figure 3. Immediate outcomes after the first stage of the revision surgery (secondary septorhinoplasty and alarplasty).

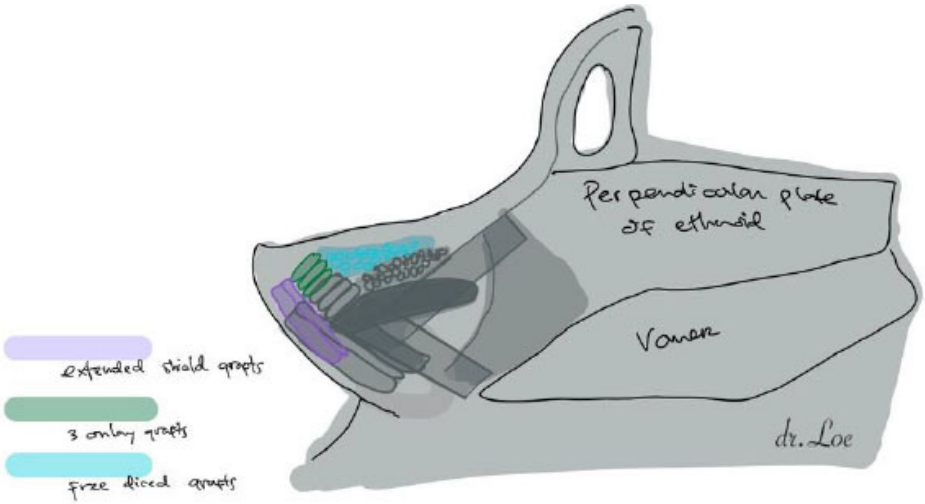

Figure 4. Outcomes after the second stage of the revision surgery.

Figure 5. Immediate outcomes after the second stage of the revision surgery (Tip-plasty and additional shield graft).

Figure 6. Two years after the first stage of the revision surgery (secondary septorhinoplasty and alarplasty).

previous interventions. The first stage was conducted after no sign of infection was observed. If needed, the second stage was conducted two years after the first one.

Surgical Procedure

The surgery procedure was performed under general anaesthesia and local anaesthesia. One percent of xylocaine (lidocaine hydrochloride) with 1:200,000 epinephrine was injected to block the infraorbital nerves. The mucoperichondrium, the dorsum, and the septum were also infiltrated. The nose, nasal floor, and septum were infiltrated with 15 to 20 mL of local anaesthetic solution. Five hundred milligrams of cefazolin were injected shortly after general anaesthesia induction.

We applied an open rhinoplasty approach. We conducted a mid-columellar V-shaped incision running along the rim of the LLC at its caudal aspect. Elevations of the columellar and dorsal skin flap to the level of the perichondrium of the LLC (underneath the superficial muscular aponeurotic system (SMAS)) were performed with angled iris scissors (stevens scissors). Significant scarring was discovered, mainly in the nasal tip and supratip area. Two-pronged skin hooks are applied to avoid pulling the fat off the dermis during the skin flap elevation.

Additionally, scissors released ULC from its attachment to the dorsal septum. The right and left LLC were separated; further, the nasal septum was exposed. The flap nasal septal mucoperichondrium was elevated bilaterally to construct mucoperichondrial pockets.

In the first revision stage, we noted noteworthy damage to the thickness of the soft tissue envelope (SSTE) accompanied by the nasal tip, dorsum discolouration, and palpable subcutaneous scarring. We also found nearly total septal loss (especially on the caudal part), contracted mucoperichondrial septum membrane, and broken medial crus of bilateral LLC.

The donor sites were also injected with a total volume of 8 to 10 cc of 1:200,000 bupivacaine/adrenaline solution. A posterior approach was utilized on the ear's concha to reveal and remove the convex concha and a 3 × 2 cm cartilage for the grafting procedure. The costa cartilage

was harvested through a three-centimetre-inframammary incision. The skin flap was inferiorly undermined and preserved in a 1 x 1.5 cm size for the dermal graft. We exposed the superior portion of the rectus abdominis muscle and the external fascia of the rectus abdominis muscle. Subsequently, the rectus abdominis muscle fibres were separated longitudinally and exposed to the cartilaginous portion of the seventh rib. The seventh rib was selected due to its bigger size and relatively straighter structure. It is also possible to cultivate them from the inframammary fold. An incision was conducted on the perichondrium, parallel to the longitudinal axis of the rib cartilage, with a number 15 blade. The perichondrium was elevated using a blunt-curved dissector, and the rib cartilage was harvested. Generally, the rib cartilage was only harvested from the lower portion of the rib cartilage. However, full-thickness cartilage was collected in some cases, especially among patients requiring a larger amount of cartilage. Finally, a 6 x 2.5 cm cartilage was obtained for the next procedure. The cartilage was stored in the saline and gentamicin solution to anticipate warping during surgery. Following the coastal harvesting, a water test via the Valsalva manoeuvre (positive-pressure hyperventilation) was performed to assess for any pleural leaks. The donor site was packed with antibiotic-soaked gauze until the end of the surgery after no air leak had been confirmed. Extra cartilage could be harvested during the procedure, or remnant cartilage can be reinserted for future use. The seventh rib was cut into two parts: the central and the periphery. The cartilage was carefully carved using the balanced forces concept of Gibson and Davis with a focus on symmetry to reduce the likelihood of post-operative warping.[22] We used the central part of the seventh costal graft as the structural grafting, such as one L-septal strut, two spreader grafts (SGs), one caudal septal extension graft (CSEG), columellar strut graft, two articulated alar rim grafts (AARG), two shield graft (SiG) to improve the showing of the columella. The right concha was applied for the additional tip projection.

An L-septal strut was inserted through a suture fixation to the anterior nasal spine, followed by the spreader graft insertion into the paraseptal pockets. Then, a caudal septal extension graft was sandwiched between these structures. The spreader and septal grafts were executed as a part of a step-off fixation. These strips were integrated using a 4/0 PDS (polydioxanone) suture to form a symmetry portion of the middle vault and extend the internal nasal valve. A small notch was complete at the inferior end of the caudal strut to conform to the anterior nasal spine. After merging the graft to the shape of the nasal spine, 4/0 PDS sutures were employed to tie the graft by suture fixation procedure through the periosteum.

A columellar strut was implanted between the alar cartilages. Further, the alar cartilages were then advanced up and over with multiple sutures. A temporary secure was conducted with a No. 30 needle. If it were considered a suitable structure, it would be sutured in place with 5-0 PDS. Distally, a braced step-off mortise type of fixation was also conducted. Subsequently, we added additional tip definition or

Figure 7. Two months after the second stage of the revision surgery.

Table 1. Ideal Asian Nose Profile.[23]

Ideal Asian Nose Profile	
Nasal Length (mm)	45-50
Index Nasal Tip Projection	0.55-0.67
Nasofrontal Angle	137-139°
Nasolabial Angle	95-100°
Columella-Lobular Angle	30-45°
Columellar show (mm)	2-4 mm
Alar Flare (mm)	2 (from the alar crease)

Table 2. Improvement of the Nasal Features.

Feature Improvement	Pre-op 1	Immediate Evaluation Post-Op 1	10 Days Post Op 1	1 Year Post Op 1	2 Years Post Op 1	Pre-op 2	Immediate Evaluation Post-Op 2	2 Months Post-Op 2
Nasal Length (mm)	39	47	47	46	46	46	49	48
Index Nasal Tip Projection	0.5	0.6	0.6	0.59	0.59	0.59	0.65	0.63
Nasofrontal Angle	150°	140°	140°	137°	137°	137°	137°	137°
Nasolabial Angle	117°	85°	85°	85°	85°	85°	95°	93°
Columella-Lobular Angle	60°	45°	45°	45°	45°	45°	42°	42°
Columellar Show (mm)	-	1	1	0.5	0.5	0.5	2	2
Alar Flare (mm)	4.5	2.5	2.6	2.6	2.6	2.6	2.3	2.3

projection, onlay, and shield shape tip grafts. Once the ideal tip was achieved, a syringe would be filled with diced cartilage and then placed to occupy the void between the suprabreak and tip. All the dorsum were covered with a dermal graft from the inframammary fold and the skin was also redraped. The cartilage was diced to fill the void at the suprabreak tip. The mid-columellar and the intranasal incision were closed using 6-0 Prolene and 5-0 rapid Vicryl, respectively.

After the closure, the width of the nasal base was reassessed. Both alar flaring and sill excess were identified. We eventually decided to decrease them (alarplasty) with a two millimetres reduction on each side. The alar wedge and sill excisions were designed before the procedure. We also marked an oblique line for the alar segment realignment after the sill excess removal. Incisions were started 15 minutes after the post-lidocaine hydrochloride with a 1:100 000 epinephrine injection. The incision was placed to remove the flare and put the nasal sill medially to the alar insertions. The lateral alar was preserved with a No. 15 blade. The tension at the incision borders and 6-0 Prolene sutures was alleviated by situating an absorbable braided suture (5-0 Vicryl [polyglactin 910]) in the deep tissue layer. The 6-0 Prolene sutures were employed for the cutaneous layer (Figure 2). Outcomes from the first stage procedure are presented in Figure 3.

We found no sign of wrapping or substantial absorption on the nose. Hence, the surgery procedure was performed according to the previously arranged plan. The left concha was applied for three layers of tip onlay graft and one shield graft. PDS 5.0 was used in the suturing procedure (Figures 4 and 5).

Half-inch skin tapes (3M" Steri-Strip) and a thermoplastic Denver external nasal splint were used on the dorsum and remained there for seven days. The chest wall donor site was attached to the muscle fascia, deep dermal, and subcuticular layers using 2/0 PDS and 3/0 Monocryl. The concha donor site was closed in the layer using Vicryl 4.0 and nylon 5.0 Prolene. Additionally, a bolster technique was also conducted. Subsequently, the patient was then discharged after two days of hospital stay. Nonsteroidal anti-inflammatory drugs and broad-spectrum antibiotics were prescribed for one week.

Follow-Up

Follow-ups were conducted immediately after the surgery, on the first day, second day, fourth week, sixth month, and twelfth month after the first stage of the revision rhinoplasty surgery. The patient was well, with no complications reported. She also stated her satisfaction and was pleased with the result. Two years after the first surgery, she desired to proceed to the second stage of surgery to increase her nasal tip (Figure 6). Therefore, the second stage was performed two years after the first revision rhinoplasty procedure. The cosmetic outcomes from the second month-follow-up are presented in Figure 7. After the surgical procedure, the patient attained an obvious improvement in her nasal position, shape, and contour and was very pleased with the appearance. The improvement was assessed based on the ideal Asian nose profile from the 16+mankosuhbook (Table 1). The finding reported the improvement in nasal length (39-46-48 mm), nasal tip projection index (0.5-0.59-0.63), nasofrontal angle (150-137-137°), nasolabial angle (117-85-93°), columella-lobular angle (60-45-42°), columellar show (0-0.5-2 mm), and alar flare (4.5-2.6-2.3 mm) on the pre-operative, first, and second stage (Table 2). The surgery's first and second stages observed no significant absorption and wrapping. The breathing pattern was also improved on both sides of the nose. Well-recovered donor sites were also observed. The patient stated her satisfaction and was very pleased with the final result.

DISCUSSION

The outcomes of septorhinoplasty revision may vary significantly. This section will discuss the intraoperative findings and surgical techniques applied to the secondary revision procedures. We decided to execute an open approach due to the nose defect level in the presented case. Other surgeons may propose a close approach for this case. However, we preferred the open approach to provide optimal visualization of the underlying deformities.

Due to its crucial position, the nose provides a decisive role in appearance. Asian noses are characterized by a round or bulbous tip, less tip projection, lower dorsum, and wider nasal base.[24-25] Asian patients generally have smaller septal cartilage than white patients. Further, various works of literature mentioned that the mean septal cartilage area among Korean men and women patients was 8.18 cm2 to 8.57 cm2 and 7.36 cm, respectively.[26] Asian septal cartilage is generally thinner. However, the submucous resection (SMR) of the quadrangular cartilage tends to weaken the nasal support. These anatomical structures generate a more difficult situation for the secondary revision procedure.

Typically, Asian patients request augmentation of existing structures rather than reductive procedures, especially those concerning dorsal augmentation and tip projection.[27] Alloplastic implants have enjoyed their popular period. Unfortunately, the concept of the ideal alloplastic implant has not been demonstrated. Several alloplastic procedures have been widely developed and rapidly surfaced in recent decades, enjoyed brief success, and then sank as long-term difficulties resulted in infection, extrusion, patient unacceptance, and other preventable complications became evident over time.

Dorsal augmentation and tip plastic are commonly used L-shaped silicone implants. However, a high incidence of complications after the surgery, particularly infection and implant protrusion were associated with the implant used in the long-term follow-up study.[28] The risk of skin damage and implant extrusion increased with excessive pressure on the soft-tissue envelope from over-augmentation with an inappropriately large implant or inadequate soft-tissue coverage, particularly in the nasal tip and columella. Bolstered pressure within the lobular component and tip support is widely mentioned as a factor that minimizes lower complication rates.[29] Additional complications include seroma, infection, capsular contraction, and implant deformation. Bacterial colonization is quite common and may lead to infection due to the capsule's

poor vascularity, even years after the placement.[29-31] Four percent of the mean infection rate due to the application of silicone implants was yielded in a recent meta-analysis.[2] Over time, asymmetric capsular contracture could happen, causing an implant deformation or displacement and unsatisfactory aesthetic results.[29-31]

The nose deformity was analyzed to plan the reconstructive approaches and techniques. We were visualizing the nose as an organ composed of an interlocking, interdependent series of individual anatomic components. The proper reconstructive grafts can be separately crafted and implanted by conducting a thorough observation and analysis of the missed, deformed, or structurally defective components. The portions of the nasal bony pyramid and paired-upper lateral cartilages are commonly overlooked or defective in the saddle nose deformity. Consistent findings suggest significant depression of the supra-tip cartilaginous dorsum due to septal cartilaginous collapse, dislocation, or resorption due to previous surgical procedures. The bolster loss may demonstrate inadequate supports (with a diminished tip recoil mechanism); anatomic deficiencies frequently accompany columella retraction.

Our subject was diagnosed with a secondary contracted nose or saddle-Asian nose. This deformity is the most typical iatrogenic complication identified among Asian septorhinoplasties. Shred of literature has widely mentioned the difficulty in achieving an aesthetically pleasing nose profile in these cases. The comparison between the midline elongation in the primary and secondary cases is mandatory in the second case. Significant support is essential for infection-induced skin shortening management. Septal reconstruction with septal extension is also highly advised. Saddle nose deformity is a pathologic entity occurring due to dorsal height loss. This deformity occurs due to the substantial amount of cartilaginous vault reduction in the bony vault. It would manifest as numerous features, such as a "middle vault and dorsal depression, loss of tip support and definition, columellar retrusion, a shortened vertical length, tip over rotation, and retrusion of the nasal spine and caudal septum.[32] Most saddle nose deformities are acquired, escorting several nasal pathologic conditions. A higher risk of saddle nose deformities occurs among trauma victims, cocaine abusers, and patients who have experienced previous septorhinoplasty.[33]

Saddle noses differ significantly in their characteristics and degree of deformity. Its classification holds an essential role in the purposes of clinical reconstructive planning. There are three general categories of saddle nose deformity: minimal, moderate, and major.[34] The minimal saddle nose deformity appears as a supratip depression that is generally bigger than the desired one to two mm tip-supratip differential. Further, it accompanies by a mildly accentuated bony nasal hump. Apparent columellar retraction presence would make a thinner nose appearance. Minimal supratip augmentation with cartilage or fascia is demanded. On some points, sufficient contouring procedures may be achieved by slightly decreasing the prominence of the bony hump, with or without concomitant supratip graft placement. A significant loss of quadrangular cartilage dorsal height (due to "septal collapse, abscess, and necrosis or marked trauma") marks a moderate degree of saddle nose.

Further, it also characterizes a significant columellar retraction from the latter tissue losses with an increasingly acute nasolabial angle. In addition, a saddling condition induced by blunt trauma would be presented by a broad and flattened bony pyramid, necessitating augmentation, osteotomy narrowing, or both. A major proportion of saddle noses demonstrates the stigmata of the moderately saddled nose, only to a more obvious degree. They generally result from childhood or massive frontal trauma and are frequently associated with a major nasal twist and severe septal deformity. The open approach may be contemplated as a surgical technique for total nasal reconstruction that correlated with a significant graft augmentation.[34]

Sang Min Hyun et al. also mentioned four types of saddle nose deformity.[35] Type 1, 2, 3, and 4 were characterized by minor supratip or cartilaginous dorsal depression, moderate to severe cartilaginous dorsal depression with a prominent lower third, pan-nasal defect with a severe bony dorsal deficiency in combination with a lower third deficit, and pan-nasal defect and a relatively prominent tip projection only by the lower lateral cartilage, respectively.[35] According to these characteristics, we classified the present case as a type 3 saddle-Asian nose with moderate deformity.

We discussed the need for rib cartilage and concha harvesting in the pre-operative consultation session. The infection from the previous alloplastic rhinoplasty procedure had majorly contributed to nasal structural depletion. According to the physical examination and medical assessment, the tip complex and the alar base were shown as a short nose with a cloverleaf tip and pollybeak deformity profile. There was an effacement on the tip defining points, columella retraction, nostrils asymmetry, deprojected tip, overrotated tip, lack of tip support, alar pinching on the left side, external valve collapse, and alar flaring. All of the findings mentioned above were probably attributed to the (asymmetric) over-resection of the LLCs and severe injury, infection, and weakening of the tip support mechanism, including the Pitanguy ligament, interdomal ligaments, membranous septum, and scroll ligaments. The aggressive cephalic trim of the LCs would lead to the lateral support weakening and internal nasal valve collapse. The patient's previous procedures had initiated the columella retraction that led to caudal septum shortening and scarry retraction. A flat nose, cloverleaf, deprojected, and short nose with alar base and columella irregularities represented a strong indication of caudal septal extension graft (CSEG) application, the combination between TG manoeuvres and articulated alar rim grafts (AARG) or lateral crural extension grafts.[36] The CSEG application manages the shortened nose and columella retraction issues. Furthermore, it would generate a stable central pillar for the reprojection of the deprojected flat and pinched nose and nasal tip.[36-37] The AARGs will address the alar base irregularities "(pinching, retraction, asymmetries, cloverleaf, alar furrow)" and stabilize the external valve collapse.[36] Additionally,

we used a tip shield graft (SiG) with the buttress graft to create a nose elongation effect on the nose and add more projection to the tip.[38-39] We selected AARGs to adjacent the crural strut grafts due to the need for more cartilaginous material in the last procedure.[36] Furthermore, the combination between the AARGs and CSEG has been established as the supreme indication for external valve obstruction with a cloverleaf flat nose.[36-40]

This situation demands adequate planning to anticipate the need for significant structural grafting at the first stage of septorhinoplasty, such as one L-septal strut, two spreader grafts (SGs), one caudal septal extension graft (CSEG), columellar strut graft, two articulated alar rim grafts (AARG), two shield graft (SiG), and other additional tip graft. All of these grafts should be put in a straight position to provide adequate and steady support, enduring the weight of the SSTE and resisting the recoil forces.[36,41]

Costal, auricular, and septal cartilage is widely used in autologous rhinoplasty. Unfortunately, most Asians have insufficient septal cartilages to meet the procedure requirements, even in primary rhinoplasty procedures.[17] Auricular cartilage offers less strength than the costal cartilage, which may not be acceptable for severe short and bulbous nose correction procedures. Although the suture technique of lower lateral cartilages is applied to improve the nasal tip support, the thick structure of the soft tissue envelope and underdeveloped media crura in the majority of the Asian nose has been providing a variety of obstacles to ideal nasal tip shape and projection correction. Another advised surgical technique was suggested for the procedure. The structural supporting grafts, such as the columellar strut graft or CSEG, coupled with the suture technique, are essential in this procedure. The media crura of lower lateral cartilages obtain sufficient support from the columellar strut graft, receiving adequate nasal tip projection.[42] However, nasal shortening and nostril exposure could be induced by the cephalic rotation of the dome. The CSEG is demonstrated as an effective method to manage "nasal lengthening, tip projection, and rotation", letting a recompensation for the shortcomings of the columellar strut graft.[43,44]

In their study, Sang Min Hyun et al. demonstrated that a rib graft should be considered for a strong and stable septal cartilage framework construction, especially for types 2 to 4 saddle deformities.[35] The risk of unwanted warping could be minimized by using the oblique cutting technique and graft reserving process in a saline solution for more than an hour.[45]

In recent cases, we classified the deformity into the type 3 saddle nose. A total absence of septal support for the cartilaginous vault, columella, nasal tip, and external valves marked it. The foundation layers consisted of bilateral-extended-spreader grafts (35 x 3 mm). The contour followed the rib curvature to facilitate the cephalically placement under the bony vault. Gunter and co-workers referred to these processes as "pistol" grafts.[15] The septal L-strut is intended to replace the vertical component of the L-shaped dorsocaudal septum. It was separated caudally and subsequently sutured in a straddle position directly to the anterior nasal spine. The Septal L-strut extension technique considers the best procedure for the iatrogenic short-nose deformity (especially in the secondary septorhinoplasty) due to previous alloplastic implant procedures and saddle-nose deformities. Patients who previously received implant materials had manifested strong antipathy responses for another implant. Further, in most septorhinoplasty secondary cases, septal and concha cartilages may no longer be observed. Hence, rib cartilage frequently is referred to as the most valuable and final source of material for septal reconstruction.[46] We provided additional stabilization in our technique, particularly for the L strut stabilization by suture fixation with alar cartilages and suture wreathe with the upper lateral cartilages.

A columellar strut was implanted between the alar cartilages due to the major tip support requirement. Subsequently, the alar cartilages were advanced up and over with multiple sutures, constructing an ideal tip projection. The desired tip was potentially achieved with the sutures procedure.[47] The columellar strut fetched down the distal end of the spreaders. The fixation site will be located several millimetres under the tip of the strut, permitting the alar cartilage to be advanced over the top of the strut. The point was halfway between the "columellar break point and the tip".[47]

We added additional "tip definition or projection, onlay, and shield-shaped tip grafts procedure". A syringe would be filled with diced cartilage after ideal tip attainment. The void between the suprabreak and tip was subsequently filled. All the dorsum covered with a dermal graft from the inframammary fold and skin were redraped. No dorsum augmentation was conducted. Collapsed vestibular and nostril valves are required to insert an alar rim support graft. These grafts are made from the "shaved curled rib segments", three to six mm in length but only one millimetre in volume. They were contoured to maximize esthetic nostril delineation while also delivering essential support. These techniques are the variation of Sheen's alar grafts.[48] They were sutured along the alar rim rather than inserted through an alarotomy incision in the alar base.

Skin and soft tissue damage is a short- or long-term complication after rhinoplasty.[49-50] The temporary damage will appear immediately after any medical procedure types. It most likely appears as hematoma, bruising, ecchymosis, or oedema. Studies widely identified surgical dissection within a severely superficial plane as a factor that may contribute to the risk of long-term damage. Current publications propose a supraperichondrial dissection or even subperichondrial dissection for maximum preservation of blood vessels, nerves, and soft tissue.[49-50] Eventually, SSTE damage was at least partially generated by an infected alloplastic implant and repeated HA injection. Case reports from the literature on anatomic dissections and experiences with the so-called "liquid rhinoplasties" revealed HA injections in the nasal area put a significant risk for blood vessel obstruction that may lead to atrophic skin damage or even necrosis, blindness, or ischemic insult.[51] Additionally, the claim of expertise in absorbable HA material did not work in the current case. Our

findings reported that the material of HA had not been completely absorbed, even six months after. We then decided to put dermal grafts on top of all the cartilage structures.

The rib donor site was covered after the carving and securing process of the cartilage grafts at the graft site. This procedure enables the re-harvest of further cartilage in cases of mishap during the shaping, inset, and fixation of cartilaginous struts. This also reduces the risk of deformities on the chest wall of the donor site because it allows the left-over replacement. The concha donor site was then closed using vicryl 4.0 and 5.0 nylon. We also conducted an additional bolster technique for hematoma prevention.

Flaring is the lateral aspect of the ala that significantly stretches above the alar-facial groove. It may occur due to various causes, such as ethnicity, trauma, cocaine use, or previous rhinoplasty procedure (i.e., "reduction rhinoplasty with retrodisplacement of the tip or derotation").[52] It may also produce a broadened nasal base. This flaring may affect the appearance of the lateral ala, bearing a more circular form than that of a gentle curve. Moreover, various pieces of literature agreed that the reduction of nasal base width should be considered when the internal distance exceeds the intercanthal distance in a Caucasian patient.[52-57] However, ethnic differences and personal preferences may deliver significant differences in the standard.[58] Another typical indication for the alar width reduction is the sidewall flaring correction that retrodisplaced from the nasal tip may cause.[59-60] As mentioned in the previous section, alar flaring is the lateral aspect of the ala extending significantly beyond "the alar-facial groove.[61-62] Aufrich designed a manoeuvre for a nasal sill excision that has been widely conducted today.[63] The need for excessive flare and enlarged nasal sill width correction pushes us to perform wedge excision manoeuvres as the latest rhinoplasty technique due to deprojection's effect on the increased flare appearance. Conversely, the nose projection frequently decreases the demand for an alar base reduction procedure. Deprojection will not modify the nostril sill's size, except for the significant tension septum cases. The nostril could be stretched due to the "tent pole"; in other words, this tension release would reduce the nostril size. A strategic incision of the nasal base results in imperceptible scars. However, incision scars could persist for many reasons, particularly due to internal alar border violation and nostril intrusion. The effects of nostril reduction on the nasal aperture are crucial. Thorough consideration is required to prevent nasal airway obstruction due to the nasal sill excision. A thorough evaluation and meticulous technique during the base reduction procedure are suggested.

We assessed the complication, anatomical improvement, function enhancement, and patient satisfaction after the procedure. "Postoperative complications, including infection, gross absorption, graft exposure, implant exposure, or implant migration," were evaluated and documented. We use anthropometric landmarks to evaluate anatomical improvements. The level of patient satisfaction was also reviewed by a verbal question of how patient rated their postoperative nasal appearance. Septoplasty patients with subsequent saddling reported a relatively progressive recovery period from three to six months after the procedure, before the final deformity stabilization.

The long-term follow-up demonstrated that our technique had constructed a stable nasal tip refinement. Furthermore, the nasal parameters, such as the nasal height, nasal length, nasofacial angle, and nasal tip angle, slightly improved after the procedure. The postoperative columella width and show were also sufficiently corrected. This technique has refined the nasal profile, which was revealed by the postoperative nasal and nasal depth-nasal width index. Thus, sufficient correction procedures of the nasal tip, such as projection, rotation, and nasolabial angle, had been adequately presented by this technique.

This technique offers several advantages. A prominent benefit identified was the structure of the coastal cartilage graft. Its structure represents the physiological nasal tip structure, permitting the elastic tip to endure a moderate level of post-surgery external force, even with rigid fixation between SEG and septum. This technique also allows nasal length and tip projection modification by adjusting the direction of triangular SEG to suit the individual's taste. Third, the tip projection improvement. The fixation of the two wings of the strut to the domal segments of the lower lateral cartilage to form the double arches generates better tip projection improvement. The fourth advantage was the protection of the nasal septal cartilage, which has been damaged by previously infected alloplastic rhinoplasty, as a supporting strength of the nose. Fifth, this technique preserves the intact cartilage membrane and matrix, thereby assisting the costa cartilage graft to form a strong unit that provides exact support to enhance tip projection and prevent the cephalic dome rotation. Considering these major benefits, this technique is a relatively modest approach to correcting mild to severe saddle noses among typical Asian noses. This technique was rarely introduced to manage severe short and saddle-nose cases. Thus, the scientific evidence was quite limited. Future studies are suggested to report the application of similar techniques in similar cases to explore and evaluate the outcome of the technique.

CONCLUSION

Secondary contracted nose or saddle nose, especially among Asians, is the most challenging case in secondary rhinoplasty procedure. This procedure commonly presents challenging aesthetical corrections and likely leads to iatrogenic complications. Reliable supports require to manage the infection-induced destruction of the nose structure and prevent skin or soft tissue envelope shortening. This finding is intended to encourage younger surgeons to build grounded perspectives and deliver patients' sensible expectations of the final surgery result. Saddle nose deformity deserves our commitment to achieve surgical excellence.

CONFLICT OF INTEREST

The author reports no conflicts of interest in this work.

ETHICS CONSIDERATION

Informed consent was provided before the study was conducted, following COPE and ICMJE guidelines regarding publication ethics.

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AUTHOR CONTRIBUTIONS

All authors equally contribute to the study from the conceptual framework, data acquisition, and data analysis until reporting the case study results through publication.

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