ORIGINAL RESEARCH

Comparison of Clinical Results of Crescent-Shaped Expanded Polytetrafluoroethylene (e-PTFE) and Granulated Rib Cartilage for Filling The Nasal Base to correct Midface Depressions

Ke Wang, MM; Ming Chen, MM; Bing Yu, BM; Zongke Guo, MM

ABSTRACT

Objective • The center of the face plays an important role in the fullness of our facial contours, however, sunken center of the face is more common in Asians than in Europeans and Americans. Expanded polytetrafluoroethylene (PTFE) and rib cartilage are commonly used to fill the nasal base to improve the hollowing of the center of the face. This study aimed to compare the efficacy and safety of crescent-shaped expanded polytetrafluoroethylene (e-PTFE) with granulated rib cartilage for nasal base filling to treat midface depressions.

Methods • Fifty-one patients with mild to moderate midface depression and normal occlusion admitted to our department from June 2017 to August 2020 were selected. Comprehensive rhinoplasty was performed, which included nasal base filling using crescentic e-PTFE or granulated rib cartilage. They are all women, with an average age of 27.4 years. The e-PTFE group (group A) had 27 cases, while the granulated rib cartilage group (group B) had 24. Changes in two face parameters, the wing ear line and facial convexity, were measured and recorded based on preoperative and postoperative photographs of the patients and using 3D imaging technology. Postoperative complications and satisfaction were assessed by questionnaires to compare the two surgical approaches' differences, advantages, and disadvantages.

Results • Postoperative midface depression improved significantly in 51 patients. Most of the patients who underwent both procedures showed significant improvement in the wing ear line and facial convexity. The 3D imaging has also helped us to more objectively assess the changes in midface concavity. Some patients experienced acute discomfort, such as foreign body sensation and stiffness in the surgical area, for the first three months after nasal base filler surgery. Still, these symptoms resolved on their own within six months. Most patients (92.6% in group A and 91.6% in group B) felt that they had natural facial expressions and were satisfied with the filler results.

Conclusion • The use of crescentic e-PTFE and granular rib cartilage to fill the nasal base is easy to operate and has a quick postoperative recovery, allowing for good postoperative results. However, after some of the granular rib cartilage filling treatments, the height of the nasal base was lowered, which may be connected to its limited structural support, ease of displacement, and resorption. Crescentic e-PTFE is superior to granular rib cartilage in terms of both morphology and mechanical support. The crescentic e-PTFE filling method provides rapid postoperative recovery and good shape maintenance, but local stiffness is more pronounced than in the granular rib cartilage group. This may help the plastic surgeon's choice of surgical procedure. (*Altern Ther Health Med.* 2024;30(1):434-440).

Ke Wang, MM, Resident doctor; **Ming Chen,** MM, Attending doctor; **Bing Yu,** BM, Attending doctor; **Zongke Guo,** MM, Associate chief physician; Department of Plastic and Reconstructive Surgery, Zhongda Hospital, School of Medicine, Southeast University, Nanjing, China.

Corresponding author: Zongke Guo, MM
E-mail: dcgzk@163.com

INTRODUCTION

Midface depression is a common aesthetic defect in East Asian populations. Compared to Caucasians, East Asians are more likely to exhibit a low midface, paranasal depression, and anterior convexity of the superior alveolus, which a flat nasal deformity may accompany[1]. This contributes to their desire to avoid socialisation as much as possible, as well as their profound sense of inadequacy.

The midface is a key area that defines the overall contour and impression of the face. It is positioned in the center of the face. East Asians consider women with a full midface to be more appealing, however, excessive zygomatic and labial prominence might result in facial incongruity. Previous method of correcting midface depression were mostly complicated, more invasive and had more complications,

which discouraged many candidates. The nasal base is the basal portion of the nose (mainly the external nose, which is the part of the nose that can be seen from the outside) that is connected to the upper lip. Nasal base filler surgery can address facial depressions and improve the convexity of the mouth. The need for nasal base filling surgery arises from the fact that rhinoplasty cannot address the issue of facial depression (nasal base depression) in patients with a concave middle face (nasal base). Only via surgery may satisfactory results be obtained, giving the face a fuller appearance. Nasal base fillers are becoming increasingly popular as patient demand for minimally invasive procedures grows.[2] This study compared and analyzed the efficacy, advantages, and downsides of two surgical techniques for nasal base filling in patients with mild to moderate midface depressions.

In this study, the nasal base was filled with crescent-shaped e-PTFE and granular costal cartilage, which is simple to operate, recovers quickly after surgery, and has positive postoperative effects. The height of the nasal base does, however, diminish following partial granular costal cartilage filling therapy, which may be due to inadequate structural support, simple displacement, or absorption. In terms of morphology and mechanical support, the crescent-shaped e-PTFE beats out granular rib cartilage. Fast postoperative recovery and nice shape are benefits of the crescent-shaped e-PTFE filling technique, but local stiffness is more prominent than in the granular rib cartilage group. The findings of this study are important when plastic surgeons select surgical techniques.

MATERIALS AND METHODS

Fifty-one patients who had rhinoplasty with nasal base filling in our department were selected between June 2017 and August 2020. All patients underwent rib cartilage combined with e-PTFE rhinoplasty. At the same time, patients underwent nasal vestibular approach with e-PTFE (27 patients) and granulated rib cartilage (24 patients). 51 patients were female, aged 18-39 years, mean 27.4 years. Informed consent was obtained from all patients.

Inclusion and exclusion criteria

Inclusion criteria. (1) Patients exhibited mild to moderate midface depression with normal dental occlusion and did not require orthognathic surgery. Because severe malocclusion cannot be achieved by simply filling the base of the nose, a more satisfactory postoperative result can be achieved. (2) agreed to participate in the study and signed a written informed consent.

Exclusion criteria. (1) Exclusion of local skin abnormalities affecting the judgment of postoperative results includes the following; previous history of filler injections in the surgical area; red, swollen, and broken skin in the surgical area; scarring; (2) Those who have an abnormal physical or mental condition that prevents them from undergoing surgery: patients with serious primary diseases such as cardiopulmonary, hepatic, renal, and hematologic diseases, psychiatric disorders, and diabetes mellitus; and (3) patients who, in the opinion of the investigator, are not suitable for participation in this study.

Figure 1. (A, B) Preoperative CT and 3D reconstruction of the midface and rib cartilage, as a way to assess the degree of midface depression and the degree of rib cartilage ossification

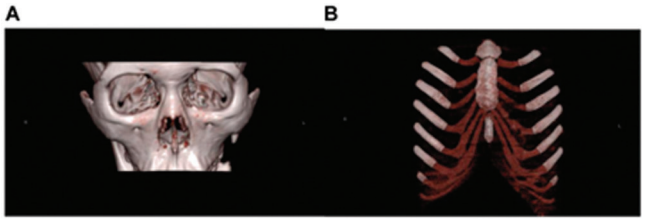
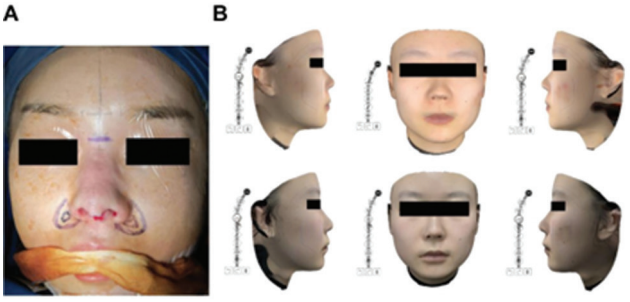


Figure 2. (A, B) Design of crescent-shaped peeling area on both sides of the nose (left), 3D camera simulated before and after surgery comparison images (right)



Preoperative preparation

Image acquisition. All patients underwent facial image acquisition in the photography room of our department before and after surgery. A Canon powershot G11 camera with a medium focal length lens (90-130 mm), an aperture of f/22 to f/32, and a shutter speed of 1/60 and 1/100 second, This will avoid taking pictures with blurred focus. The light source was a 5500 K color temperature flash, one on each side at 45°, with a 90° angle between the two to avoid shadows on the patient's face. The height and distance were adjusted using a triangular bracket at the same level as the subject area. The patient is 30 cm from the background, and the standard front view, two 45° oblique views, and two lateral views are included. This will ensure that we take images of the same size and angle and try to avoid variability. The above standardization of equipment and photography will help us to obtain clear facial contours and variations in angles under good lighting. In addition, standardized measurements and photography will help us to compare the results of the same patient before and after surgery, as well as the measurement of related data, which will ensure the accuracy and uniformity of our experimental results.

The patient had a CT plain scan and 3D imaging of the face and chest (Figure 1A, 1B) performed before surgery. Based on the 3D camera, 3D imaging of the face, and the extent of midface depression in the sitting and lying position, body projections of the crescent-shaped peeling area were designed on both sides of the nose and simulated comparison images before and after surgery[3, 4] (Figure 2A, 2B)

Data measurements of the wing ear line and facial convexity of the patient before and after surgery (Figure 3). The wing ear line (In-Ar') is a facial arc that connects the ear screen notch (intertragic notch, In) to the nasal rim point (alar rim, Ar). The bigger the line, the greater the local convexity of the nasal base after filling. The facial convexity (G-Ar-Pog) is the angle pormed by the line connecting the point between the eyebrows (glabella, G), the point of the nasal rim (alar rim, Ar), and the point of the anterior chin (pogonion, Pog), and the smaller the value, the greater the convexity of the nasal base.[5]

Figure 3. Facial convexity G-Ar-Pog, G (glabella) interbrow point, Ar (alar rim) nasal rim point, Pog (pogonion) anterior chin point, wing ear line In-Ar' In (intertragic notch) ear screen notch, Ar' (alar rim) nasal rim point.

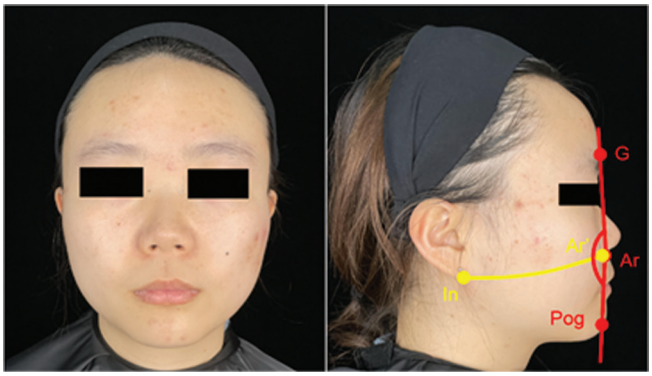
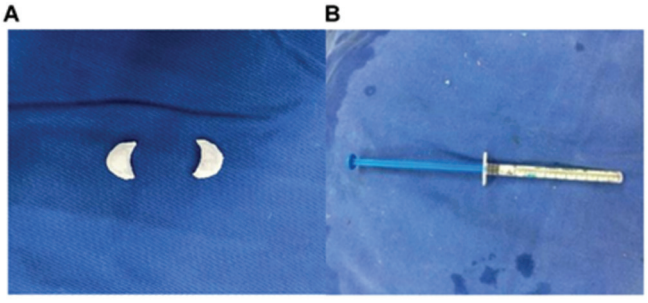


Figure 4. (A, B) Crescent-shaped e-PTFE (left). Granular cartilage 1.0 ml (right)



Surgical method

Excision of rib cartilage. According to the CT+3D imaging results of rib cartilage before surgery, the unilateral rib cartilage with good blood supply was selected. The skin was incised layer by layer from the quarter rib to the anterior sheath of the rectus abdominis muscle, and the rectus abdominis muscle was bluntly detached to the surface of the rib cartilage with vascular forceps. The area was completely exposed, and the costal cartilage membrane was incised along the midline of the rib cartilage's long axis and subcutaneously separated under the cartilage membrane with a stripper to completely free and intercept 4 to 5 cm of rib cartilage, which was wrapped in wet saline gauze. After exact hemostasis of the incision, sterile saline was poured in, and the incision was closed in layers after the swelling lung was checked for air bubbles. After comprehensive rhinoplasty (all patients adopt the "4+1" nasal scaffold construction method), nasal base filling is performed.

Crescent sculpture/granular rib cartilage preparation. The remaining e-PTFE after rhinoplasty was sculpted into a crescent shape with a thin edge and thick center, sloping and curved according to the 3D CT image of the anterior part of the surgery and the depression of the patient's nasal base during surgery (Figure 4A). The inner side adheres to the curve of the nasal wing, whereas the outer side conforms to the outer border of the pyriform foramen. After sculpting and shaping, they were placed in a syringe containing gentamicin solution (80 mg of gentamicin sulfate injection + 10 ml of 0.9% saline), and the syringe nipple was plugged for negative pressure aspiration and soaked for backup.[6,7] The cartilage remaining after rhinoplasty was cut into granules of 0.5 to 1.0 mm in length, width and height and filled into a 1 ml syringe with the anterior needle nipple cut off. It was compacted to reduce the intergranular spaces (Figure 4B).[5]

Crescent-shaped e-PTFE and granulated rib cartilage nasal base filling

On the lateral side of the bilateral nasal vestibule, near the junction of skin and mucosa at the edge of the pear-shaped foramen, an incision of about 7-10 mm in length was made, and a subtle separation was made with a periosteal stripper in an arc of 1.0-1.5 cm around the subperiosteal pear-shaped foramen. The soft tissues and ligaments of the nasal base around the pyriform foramen were fully freed to form a certain cavity. Crescent-shaped e-PTFE (or granular cartilage 1.0 to 1.5 ml) was implanted along the incision into this cavity, 6-0 absorbable sutures were used to secure the prosthesis (or granular cartilage), and 6-0 Prilling sutures were used to secure the mucosal incision of the nasal cavity.[1]

Postoperative dressing fixation

After surgery, the dorsum of the nose is fixed externally with thermoplastic plates and paper tape laminated and crossed for 5 to 7 days. The base of the nose was wrapped with a gauze block with local pressure for 5-7 days to prevent the filler from shifting. Postoperative infection prevention was routinely performed, and stitches were removed in 7 days.

Main observation indicators

We performed follow-up visits and took photographs before surgery, 1 month after surgery, and 6 months after surgery. Using Three-dimensional (3D) imaging software, pre- and post-surgical morphology of the face was simulated and parameters were measured. Two evaluators measured and evaluated all results, and the mean value was calculated.

Facial aesthetic data measurement

Wing ear line (distance between the ear screen notch and the nasal rim point) and facial convexity (angle of facial convexity determined based on the point between the eyebrows, the point of the nasal rim and the point in front of

Table 1. Satisfaction with nasal basal fillers

	Very satisfied	Satisfied	Dissatisfied	Very dissatisfied
1.Nasal base height	3-4	2-3	1-2	0-1
2.Width of nasal base	3-4	2-3	1-2	0-1
3. Lateral view of nasal base	3-4	2-3	1-2	0-1
4. Is the nasal base in harmony with the whole face?	3-4	2-3	1-2	0-1
5. How does it look from all angles?	3-4	2-3	1-2	0-1
6. Are you satisfied with yourself in the photo?	3-4	2-3	1-2	0-1

Table 2. Adverse effects on the face

	Very satisfied	Satisfied	Dissatisfied	Very dissatisfied
1. Local foreign body sensation	3-4	2-3	1-2	0-1
2.Local softness	3-4	2-3	1-2	0-1
3. Skin looks thick or swollen	3-4	2-3	1-2	0-1
4. Local appearance of unnatural unevenness	3-4	2-3	1-2	0-1

Table 3. Comparison between groups of wing ear line and facial convexity

	Wing Ear Line (mm)			Facial Convexity (°)		
Group	Before surgery	1 month after surgery	6 months after surgery	Before surgery	1 month after surgery	6 months after surgery
A	115.4±5.4	119.9±5.0	119.4±5.1	176.4±4.9	167.8±5.2	170.0±5.9
B	114.8±5.3	119.3±5.4	118.6±5.4	177.1±5.3	169.2±5.3	172.6±5.5
P value	0.625	.454	.665	.493	.178	.027

Note: Group A (e-PTFE group), Group B (granulated rib cartilage group)

Table 4. Satisfaction survey of patients 6 months after surgery

	Satisfaction			
Group	Very satisfied (30%-40%)	Satisfied (20%-30%)	Unsatisfied (10%-20%)	Very dissatisfied (0-10%)
Group A	15(55.6%)	10(37.0%)	1(3.7%)	1(3.7%)
Group B	11(45.8%)	11(45.8%)	2(8.4%)	0(0%)

Note: Group A (e-PTFE group), Group B (granular rib cartilage group)

Figure 5. Intra-group comparison of wing ear line and facial convexity

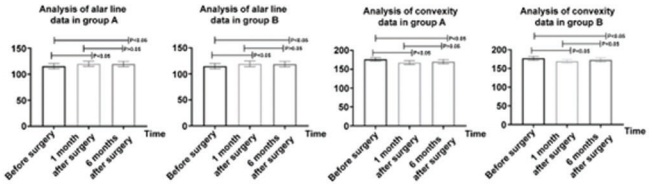


Figure 6. Comparison of preoperative and 6-month follow-up photos of the e-PTFE group

the chin). During the experiment, the evaluators were blinded and unaware of their grouping and intervention methods.

Postoperative complications (infection, filler displacement, prosthesis exposure, etc.). Severity and measures taken were recorded at each follow-up visit.

FACE-Q evaluation form (6 months postoperatively)

A patient satisfaction survey (Tables 1-2) was conducted 6 months after surgery to assess the satisfaction of recording the improvement of midface depression and postoperative adverse effects. The questionnaire consisted of patient assessments of the nasal base (height, width, and harmony with the midface) and local skin (color, softness, and flatness). The questionnaires were distributed on-site or filled out online.

Statistical analysis

Statistical Product and Service Solutions (SPSS) 24.0 software (IBM, Armonk, NY, USA) was used for the analysis, and non-inferiority *t* test or one-way design ANOVA was used, and $P < .05$ was considered statistically different.

RESULTS

Fifty-one patients underwent surgical treatment with rhinoplasty combined with nasal base filling. Among them, 27 cases were filled with e-PTFE in the nasal base and 24 cases with granulated rib cartilage. All patients were followed up from 6 months to 2 years, with an average of 8.3 ± 1.6 months. The postoperative results are shown below (Figures 5-6), with significant improvement in facial aesthetics (Tables 3-4).

At the same time, we compared the values of Group A and Group B. We found that:

1. At the same time point, the difference in wing ear line values between the two groups was not statistically significant, with $P > .05$.
2. The variations in facial convexity between the two groups were compared at the same time point. At 6 months after surgery, the facial convexity in Group A improved significantly compared to Group B. At other time points, the two groups had no statistically significant difference in the convexity ($P > .05$).

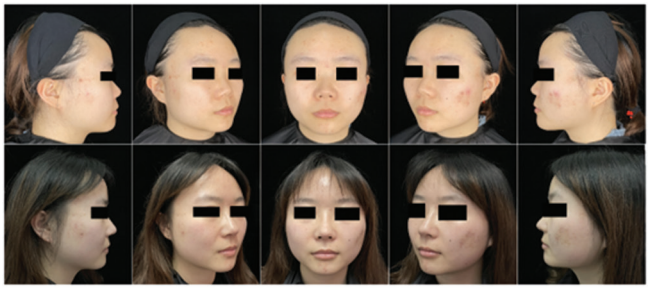
Evaluate the wing ear line and facial convexity of groups A and B separately and evaluate the multiple LSDs within the data group. At 6 months postoperatively, the wing ear line had improved by 4.0 mm in group A and 3.8 mm in group B. Facial convexity had improved by 6.4° in group A and 4.5° in group B compared with the preoperative period. By comparison, it can be concluded that there was a significant improvement in the wing ear line and facial convexity in Group A at 1 month and 6 months after surgery compared to before surgery ($P < .05$). There was no significant statistical difference between 1 month and 6 months after surgery ($P > .05$), indicating good stability. In terms of wing ear line, there was a significant improvement ($P < .05$) in group B at 1 month and 6 months after surgery compared to before surgery. However, there was no significant statistical

difference ($P > .05$) compared to 1 month and 6 months after surgery. However, in Group B, there was a significant improvement in facial convexity at 1 month and 6 months after surgery compared to before surgery ($P < .05$), and there was still a statistical difference between 1 month and 6 months after surgery ($P < .05$). The degree of central facial convexity at 6 months after surgery decreased compared to 1 month after surgery.

Based on the above results, it can be concluded that both groups A and B have significantly improved wing ear lines and A group's facial convexity compared to before surgery. A in comparison to the preoperative period. There was also no statistically significant difference in changes between 1 month and 6 months following surgery (Figure 7). However, the difference was statistically significant at $P < .05$ at 6 months postoperative compared to 1 month postoperative for group B facial convexity. This may not change much with its filling volume, but its height decreases and its area increases. Therefore, we hypothesize that there is no significant statistical difference in wing ear line changes between 1 month and 6 months following surgery, although there are statistical differences in the changes in facial convexity. Patients have high satisfaction with the improvement of cosmetic smiles and overall facial contour. Most patients (92.6% in Group A and 91.6% in Group B) rated their results as significant improvement or improvement.

Temporary discomfort occurred 3 months after surgery, including 2 cases of upper lip numbness (1 case in Group A and B), 1 case of foreign body sensation (1 case in Group A), and 3 cases of stiff smile (2 cases in Group A and 1 case in Group B), but gradually disappeared within 6 months. Complications included 1 case of infection and 2 cases of implant displacement and deviation. No systemic complications, no other late recurrence or adverse reactions.

Figure 7. Comparison of preoperative and 6-month follow-up photos of the granular rib cartilage group



DISCUSSION

The Central facial depression is mainly divided into three causes: congenital, developmental, and acquired. (1) Congenital factors include defects related to facial bones (such as Binder syndrome) and midface soft tissue underdevelopment. In patients with surgical correction of cleft lip, midface depression is a common manifestation. The changes in soft tissue and scar formation limit the growth and development of the upper jaw and palate after cleft lip repair. Race is also a congenital factor associated with facial depression, which is more common in Asian and African populations. (2) Tooth extraction is the main developmental factor in the central depression of the face, which can lead to incomplete bone development around the bicuspid teeth, resulting in a flattened maxillary plateau. (3) Acquired factors are mainly facial trauma. Loss or dislocation of the maxilla will lead to depression in the middle of the face.[8] According to the concave part in the middle of the face, we can divide it into the following three types: (1) The concave part in the paranasal area: outside the nasal wing edge, the concave part in the paranasal area, the height of the nasal tip and the nasolabial angle is usually generally normal, and the nasolabial groove generally appears earlier, which is the main reason for the formation of bone type nasolabial groove; (2) Pear-shaped foramen area depression: The area between the two nasal wings is concave - the height of the nasal tip is insufficient, the nasal columella is short, the nasolabial angle is less than 90°, and the nasal frontal angle is often greater than 130°; (3) The anterior wall of the whole maxilla is sunken: the above two parts are sunken at the same time.

There are various surgical methods for correcting the central depression of the face. Severe midface depression is often treated with LeFort osteotomy, which has a significant effect but with significant trauma and many postoperative complications, which are unacceptable to most beauty seekers. The iliac bone, skull, and coronoid process have been reported to be used for nasal base filling surgery, with a certain strength and low risk of foreign body rejection and postoperative infection. However, this method may induce serious life-threatening complications. The nasal wing base release surgery is a simple procedure with minimal trauma, but soft tissue reattachment to the bone surface is likely. The effect of lifting depends to a certain extent on the increase in nasal tip height, and the improvement effect is not significant.[7] The previous surgical methods for correcting central depression in the face were complex or ineffective or could not be widely promoted in clinical practice due to the limitations of filling materials. Whether to find a minimally invasive, beneficial, and simple surgical treatment method has become an urgent problem for plastic surgeons to solve.

In the past 20 years, more and more materials have been used for facial filling. Our department has found through years of experience in nasal base filling that granular rib cartilage, and e-PTFE have good biocompatibility, are easy to shape, and have a certain degree of support compared to other materials, which helps to achieve a satisfactory postoperative appearance.[9] Granular rib cartilage comes from its own source, with a low probability of rejection and good biocompatibility, making it less prone to infection. Rib cartilage has a high hardness. When the local bone mass is insufficient and structural filling is needed to provide support, rib cartilage is the best donor for achieving stable structural support. However, the hardness of the nasal base filled with block-shaped costal cartilage is too high, making it difficult to shape, which can cause the prosthesis to show shape, slide,

and cause local foreign body sensation. Therefore, we chose to fill the nasal base with granular rib cartilage, which has smaller particles and higher plasticity, avoiding the problems caused by the filling of blocky rib cartilage.[10] Expanded polytetrafluoroethylene (e-PTFE) is a medical polymer material mainly composed of polytetrafluoroethylene fibers. In 1982, this material was first used to repair soft tissue defects. Since then, e-PTFE has been safely and effectively used in vascular and plastic surgery. E-PTFE as an implant has the characteristics of flexibility, non-toxicity, good biocompatibility, and insoluble in water. Previous verification has shown that its fibrotic capsule is the smallest among existing prosthetic materials and one of the best soft tissue artificial implants. The bone surface of the nasal base is irregularly curved, and e-PTFE has a flexible texture that is easy to shape. After carving and shaping, it can be implanted tightly with surrounding tissues, resulting in better results for irregular surfaces.[11] The bony depression at the edge of the pear-shaped foramen of the nasal base is crescent-shaped. Choosing a crescent-shaped prosthesis can not only solve the problem of a concave nasal base but also increase the height of the lateral side of the nasal ridge, better improving the problem of a concave midface.[12]

Satisfactory surgical results require careful and meticulous pre-surgical preparation. CT 3D imaging of the head, face, and rib cartilage is used for patients before surgery. The 3D imaging can simulate the patient's facial bone shape and the degree of depression in the mid-facial region and its typology so that the scope of peeling and filling can be selectively decided for different types of mid-facial depression to improve the mid-facial shape better. We can determine the length, width and ossification of the rib cartilage before surgery by taking a three-dimensional image of the rib cartilage, and then decide where to remove the rib cartilage. As a result, we can avoid the waste of material due to rib cartilage ossification and poor blood supply.

In conventional operation, the most common complications of autologous or allogeneic implant surgery are infection and implant displacement. However, our surgical approach and the nature of the implant can effectively avoid this. Possible reasons for this are as follows: firstly, compared to the oral cavity, the nasal cavity has a small and homogeneous bacterial population, and nasal basal filling via the nasal vestibular approach can reduce the probability of infection in the operative area to some extent. Secondly, a small incision, complete horizontal dissection, and appropriate dissection area are important to fix the implant and reduce implant displacement. e-PTFE is flexible, and granular rib cartilage is easy to plasticize, and can be implanted in the depressed nasal base through a small incision. We designed the nasal vestibular incision at the pear-shaped foramen's junction and the nose's outer edge to reduce the transverse stripping distance. And the direction of dissection is perpendicular to the direction of the incision, which helps to maintain the stent firmly and make the implant embedded in the depressed area, greatly reducing implant extrusion and displacement. During the surgical operation, the amount of granular rib cartilage injection is adjusted according to the degree of nasal base depression, which can evenly distribute the pressure and reduce the local pressure, thus not causing pressure displacement in the unexfoliated area and greatly reducing the local foreign body sensation. The e-PTFE pores allow limited soft tissue infiltration and fibrous tissue growth, which can withstand certain external forces and reduce the possibility of implant displacement. In addition, our selected implant does not require screw fixation, which simplifies the operation, reduces local tissue damage, and accelerates postoperative recovery, thus reducing complications to some extent.

As shown in the previous statistics, the wing ear line and facial convexity were altered in postoperative patients with both surgical modalities, and the increased facial fullness improved the degree of midface depression, but some granulated rib cartilage filler treatments resulted in a decrease in the height of the nasal base at 6 months postoperatively compared with 1 month postoperatively, which may be related to its limited structural support and its susceptibility to dislocation and resorption. Crescentic-e-PTFE is superior to granulated rib cartilage in terms of morphology and mechanical support, and is able to maintain good local convexity, but local foreign body sensation may be more pronounced. This has important implications for our choice of clinical surgical approach.

In addition, there are some limitations of this study. First, to date, e-PTFE implants are usually considered more susceptible to infection than silicone or Medpor.[13] Although there were no cases of infection in this study, measures such as negative pressure soaking with gentamicin solution are still needed to prevent infection.[6] Second, the advantages of the nasal vestibular approach in reducing postoperative complications need to be further investigated. Relatively small incisions are an important factor in reducing infection and migration rates, but absolutely small incisions do not allow for the implantation of larger prostheses.[14] Third, surgical outcomes, although measured by indirect measurements and 3D reconstruction models, have no objective data to quantify the volume changes after local implant filling. In addition, because all patients who underwent nasal base filling underwent concomitant rhinoplasty, it's possible that this could lead to changes in lateral appearance. We therefore hope that in the future more advanced techniques will allow objective measurements of changes in localized filler volume and will allow the collection of more data on patients with simple nasal base fillers using both materials in order to minimize to a greater extent the potential influence of other factors.

CONCLUSION

In summary, the use of crescentic e-PTFE and granulated rib cartilage to improve mild to moderate midface depressions can produce subtle but significant aesthetic improvements in the Asian population. In this study, we achieved satisfactory

results with both crescentic e-PTFE and granulated rib cartilage without serious or persistent complications. This creates a softer, more youthful facial expression，in line with the cultural and aesthetic preferences of the Asian population. However, by comparison, we found that the height of the nasal base was reduced after partial granular rib cartilage filling. This may be related to the loose structure of the pellets, their limited support, the tendency of the pellet rib cartilage to shift and distort in clumps, and also a certain degree of resorption. Crescentic e-PTFE is superior to granular rib cartilage in terms of both morphology and mechanical support. Crescentic e-PTFEs have a faster recovery time and good shape maintenance after surgery, but because of their massed shape, early postoperative pressure and tension are greater than in the granular rib cartilage group, and stiffness is relatively pronounced. Nasal base fillers can easily be performed alone or in conjunction with other aesthetic procedures. The augmentation of the bony platform of the nasal base can reduce the size of the nasal appearance and increase the nasolabial angle and nasal tip projection. Improving the balance of the face in this way has the same principle as performing a chin augmentation at the same time as rhinoplasty. This similar bony enhancement creates a more pleasing midface profile, opens the nasolabial angle, increases the facial projection of the nasal tip, and reduces the size of the nose's appearance relative to the midface platform.[13] This procedure has a good synergy with rhinoplasty and chin augmentation. This avoids the localized abruptness that would result from enlargement of a single area and results in a more harmonized and fuller facial shape. Both procedures achieved high patient satisfaction (92.6% in Group A and 91.6% in Group B). Not only did the patients improve the appearance of midface depression, but also improved their low self-esteem and made them more active in their social life. However, this experiment still has some limitations. We hope that in the future, more advanced techniques will be available for objective measurements of changes in localized filler volume, and that more data can be collected from patients who underwent simple nasal base filling with both materials, in order to minimize the potential influence of other factors to a greater extent.

CONFLICT OF INTEREST

The authors have no potential conflicts of interest to report relevant to this article.

FUNDING

This study did not receive any funding in any form.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the ethics committee of Zhongda Hospital. Signed written informed consents were obtained from the patients and/or guardians.

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