

Original Article

Augmentation rhinoplasty with custom-made S-shape silicone implant in Asians: A 15-year experience

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ABSTRACT

Background: Asians have low nasal dorsum, thick skin envelope, low defined alar cartilage, low projection of nasal tip and broad alar base. Augmentation rhinoplasty with silicone prosthesis has been performed with predictable results, but unfavourable results and complications still present. This series show techniques and results from single surgeon experience. **Materials and Methods:** We retrospectively reviewed 548 patients chart during January 1995 to December 2009. All patients underwent custom-made S-shape implant silicone augmentation rhinoplasty operated by a single surgeon. There were three major operative steps: (1) Intra-operative S-shape implant carving; (2) pocket dissection through bilateral rim incision and (3) tension adjustment before closure. All the patients were recorded for early surgical complications and satisfaction. **Results:** There were 519 women and 29 men. The mean age is 25.5 years (18-56 years). Mean follow-up period was 6 months (1-60 months). The majority of patient were appointed for esthetic augmentation (86.8%). 515 cases (94.9%) showed well satisfaction following the operation. The total complication rate was 6.5% (4.9% deviation, 0.7% extrusion, 0.5% hematoma and 0.3% infection). All the complications were corrected with uneventful sequelae. **Conclusion:** Augmentation rhinoplasty with custom-made S-shape silicone implant by closed approach provides high satisfaction with acceptable early complication rate.

KEY WORDS

Aesthetic surgery; Asians; augmentation rhinoplasty; silicone implant; surgical complication

INTRODUCTION

East or South East Asian people have facial characteristics such as low eyelid creases, low nasal dorsum, thick skin with sebaceous and sweat

gland and round face.^[1-3] Silicone is the commonly used alloplastic for augmentation rhinoplasty for Asian with favorable results.^[2-6] However, many arguments in the literatures still presented due to complications such as infection, extrusion or translucency.^[4,7-10] There are other materials for augmentation rhinoplasty such as autologous or homologous cartilage grafts,^[8-14] dermal graft, Medpore,^[15] expanded polytetrafluoroethylene (ePTFE)^[16-18] and Aquamid.^[19] However, silicone is in favorable because of its biocompatibility, easily tailoring and readily affordability. Most of silicone augmentation rhinoplasty series in the literature are using pre-shaped implants. The major disadvantages of pre-shaped implant

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are price, availability that might limited and cannot match perfectly in each individual nasal anatomy. The author preferred custom-made S-shape implant and developed a surgical technique to minimize the complication. We report the clinical benefits and risk of complications of custom-made S-shape implant silicone augmentation rhinoplasty by our techniques.

MATERIALS AND METHODS

Materials

We retrospectively reviewed patients chart during January 1995-December 2009 from Division of Plastic and Reconstructive Surgery, Department of Surgery, Faculty of Medicine Siriraj Hospital Mahidol University and Professor Chuangsuwanich private clinic. All patients underwent same three-step technique for custom-made S-shape implant silicone augmentation rhinoplasty. All patients were operated by a single surgeon (A Chuangsuwanich). Demographic data, indication, surgical complication and aesthetic satisfaction were reported.

Operative method

Pre-operative consultation focused on purpose of the operation, desire of the new patient's nasal figure, medical history and physical examination. The desire of a new look was discussed individually. If the patient's desire was not possible to obtain according to their tissue characteristics, the operation would be omitted. The informed consent was co-undersigned by the surgeon and patient before the operation.

There were three major operative steps for every patient: (1) Intra-operative S-shape implant carving; (2) pocket dissection through bilateral rim incision and (3) tension adjustment before closure.

Oral cloxacillin was taken before the surgery and continued for 5 days for prophylactic antibiotic. All procedures were performed strict to universal precaution and aseptic technique. Before the beginning of the procedure, the nasal area was measured and marked vertically for midline and horizontally for nasal tip position, intercanthal position and preplanned superior limited of the implant. The procedure then began under local anesthesia with infiltration of 1% lidocaine with 1:200,000 adrenaline solutions. While waiting for the action of local anesthesia to set in the piece of silicone implant was shaped according the contour of the patient's nose intra-operatively.

Bilateral alar rim incisions 5 to 10 mm were made symmetrically according to shape of the implant, nasal skin envelope thickness and nasal anatomy [Figure 1]. Sharp subcutaneous dissection was then carried on from the incision to the lower border of the nasal bone to create a symmetrical pocket over the tip and supra-tip area. The sub-periosteal dissection was continued with periosteal elevator from the lower border of the nasal bone. The upper dissection was limited at the marked line for the superior border of the preplanned prosthesis pocket. The lateral dissection was performed to achieve the adequate pocket space, which depended on the size of the prosthesis. The dissected pocket was irrigated with normal saline and the hemostasis was secured. The custom-made S-shape implant was inserted. The contour and position was checked.

The skin tension was immediately evaluated particularly at the nasal tip, dorsum and nasofrontal area. If the skin was pale, blanched or showed a slow capillary refill, the prosthesis was trimmed and the pocket dissected to easily accommodate the implant. In addition, the intermodal cartilage suture with 5-0 nylon was performed in selected case to augment the nasal tip projection if the tip projection could not be achieved only by prosthesis insertion. Ancillary procedures for alar reshaping such as ala resection or alar base clinching were done according to individual indication. Incisions were closed with 5-0 rapid absorbable braided suture. Small adhesive tape was applied on the nasal dorsal skin and was removed at 3rd day post-operation. All patients were recorded for early surgical complications and esthetical satisfaction. To evaluate the patient satisfaction we surveyed by asking patient to indicate the score from 0 to 10. The score

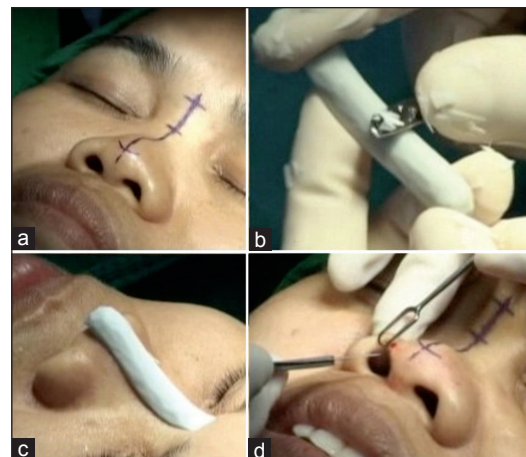


Figure 1: Operative procedure (a) line of marking, (b) carving the prosthesis, (c) the prosthesis, (d) making incision

ranges 7-10 was categorized as well satisfaction, 4-6 as moderate satisfaction and 0-3 as poor satisfaction.

RESULTS

We recruited 548 patients who operated by this technique during January 1995-December 2009. There were 519 women and 29 men. The mean age is 25.5 years (range 18-56 years). Mean follow-up period was 6 months (range 1-60 months). The indications were 476 (86.8%) primary esthetic procedures, 45 (8.2%) revision rhinoplasty procedures, 15 (2.7%) cleft lip nasal deformity corrections and 12 (2.1%) traumatic deformity corrections. Out of 45 patients, 30 patients were in revision rhinoplasty group had unsatisfied result from deviation or asymmetrical rhinoplasty performed elsewhere outside author's department. There were 124 (22.6%) ancillary procedures simultaneously performed, which consisted of 70 alar clinching procedures, 18 alar resections and 36 interdomal sutures. Moreover, 20% of the patients were undergone additional double eyelid blepharoplasty in the same surgical settings. The questionnaire showed 515 patients (94.9%) with well satisfaction following the operation [Figures 2 and 3].

The total complication rate was 6.5% (36 patients). The complications were 4.9% (27 patients) deviation, 0.7% (4

patients) extrusion, 0.5% (3 patients) hematoma and 0.3% (2 patients) infection. A total of 15 prosthesis deviations were detected less than 1 month post-operatively. The other 12 deviations presented in 6 months period. There was no complication in 124 cases, which underwent simultaneous ancillary procedures. All the complications were corrected with uneventful sequelae. Secondary augmentation rhinoplasty also was successful in all these patients after 3-6 months waiting.

DISCUSSION

Oriental nose tip projection is less than alar base, which classified as mesorrhine type.^[1,2] Especially when it is combined with prominent malar, the oriental face will look flat. Augmentation rhinoplasty can remarkably improve the patient's face. There are many materials available for augmentation of the nasal dorsum. Cartilage, bone, fat and fascia are biomaterials widely used with promising results. They are less infective when compared with the synthetic ones.^[1,8,9,14,15] The disadvantages of autologous materials are donor site morbidity, absorption and difficulty in contouring.^[9,14] Oriental noses require significant augmentation at the dorsum and tip than caucasians. Conchal cartilage is popular for tip augmentation, but its bulk is not enough for nasal dorsum augmentation. Costal cartilage provides sufficient bulk but the donor site pain, scar and risk of pneumothorax are the drawback of this donor.^[9,11] Irradiated cartilage graft can be resorbed and warped.^[12,13] Bone from calvarium has minimal resorption and scar at the donor area is concealed, but the risk from intracranial injuries has to be concerned.^[14] Dermo-fat graft is easy to obtain and the donor site can be concealed, but



Figure 2: A 24-year-old lady with 4-month and 1-year results. (a) Pre-operative pictures, (b) 4-month post-operative pictures and (c) 1-year post-operative pictures



Figure 3: A 30-year-old lady with 2-year results (pre-operative and post-operative picture of frontal/lateral/worm' eyes view)

the unpredictable resorption and inability to maintain projection are the main disadvantages.

There are many alloplastic materials available and reported for augmentation rhinoplasty including silicone, Proplast,^[16] ePTFE^[17] polyglycolic acid and polyacrylamide gel.^[19] Proplast and ePTFE allow ingrowth of the tissue, which might prevent migration of the prosthesis, but it is also very difficult to remove in a problematic case.^[18] The ePTFE has it is difficult to configure in moderate augmentation with variable curves.^[16,17] Polyglycolic acid is an absorbable material, which can alter the nasal figure after a significant resorption. Polyacrylamide and silicone fluid filler injection can cause foreign body granuloma that is very difficult to treat.^[19] In the author's opinion filler material should not be used in oriental rhinoplasty because the volume need to inject is significant.

Silicone is an alloplastic material commonly used for rhinoplasty. Variety of textures, consistencies and forms of silicone are available. Despite availability of prefabricated implants, the implants can be manually carved to a desired shape both pre- and intra-operatively. Silicone rubber is pliable yet does not warp, making the intra-operative handling and placement easy. Nevertheless, the design of the implant is a crucial step for the success of the operation. Silicone implants for nasal augmentation have been categorized into three types. These are "I", "J" and "L" shapes. From personal experiences, author found that "L" shape implant caused more extrusion and deviation than "I" or "J" shape implants. However, the "I" or "J" shape implants made nasal dorsum straight that might not look natural especially for women. Thus, the author's preference is a S-shape implant [Figure 4]. The author usually carves the implant from silicone block to match the curve of patient's

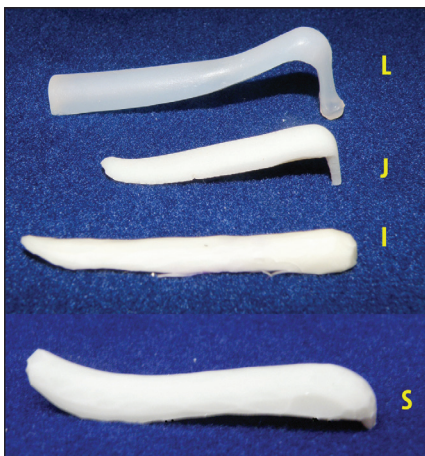


Figure 4: Types of silicone nasal implant

nose and avoid creating too much tension to the skin envelope. The probable minute irregularity of the implant surface is not obvious and not alters the contour of the nose. Pointed tip, too sharp nasal dorsum and artificial look are complications which can be occurred by incorrect implant design. As a result of author technique we can achieve 94.9% well satisfaction from patient despite the fact that most of them (86.8%) are operate for sole aesthetic purpose.

Our complication rate is 6.5% which is comparable to the previous report.^[4,5,10] Especially, the extrusion rate (0.7%) and infection rate (0.3%) is similar the complications from autogenous graft. Extrusion, inflammation and skin ulceration are the result from exceed soft tissue or skin tension.^[10] To prevent these complications, the dissection of the pocket should be adequate and the design of the implant should not cause too much tension to the soft-tissue envelope. The deviation rate is 4.9%, the cause of this complication might be from scar adhesion, misplacement or minor trauma during early recovery period. Sub-periosteal placement of the implant at nasal bone area will reduce the implant mobility. Symmetrical dissection of the pocket could reduce the chance of implant deviation.^[11,13,15] The satisfaction result can be recuperated after the minor secondary revision procedure.

Other ancillary procedures and esthetic surgery can be performed simultaneously with augmentation rhinoplasty without increasing the implant related surgical complication. Additional procedure may increase the complication rate, but we found no complication in 124 cases, which underwent simultaneous ancillary procedures. However, this may be the bias of retrospective case selection and limited number in this study group.

There are many limitations of this report series. Firstly, the mean follow time is too short to conclude the rejection rate and delayed complications such as capsule envelope contracture or extrusion. Our longest follow up is over 5 years, but our mean follow-up should be at least 2 years to report more conclusively about delayed complications. Moreover, this report has not statistically demonstrated the analysis of potential factors that may lead to complications and unsatisfied outcomes.

CONCLUSION

Augmentation rhinoplasty with custom made S-shape silicone implant in Asians give high satisfactory results with acceptable early complication rate. A good implant

design and a proper pocket dissection to avoid tension on the soft-tissue envelope and meticulous surgical techniques are key steps for the success.

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