

Original Articles

Combination of facial skeletal contouring surgery and aesthetic surgeries for Asians—personal experience

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ABSTRACT

Facial skeletal contouring surgery such as reduction malarplasty and reduction angleplasty is popular in Asian countries. With rapid economic development, an increasing number of patients receive facial skeletal contouring surgery combined with other facial aesthetic surgeries. From January 2014 to December 2016, a total of 37 patients underwent facial skeletal contouring surgery combined with facial esthetic surgeries in our department. The modified L-shape reduction malarplasty and reduction mandibular angleplasty were performed using reciprocating saws. The combined facial esthetic surgeries are 4 cases of double eyelid blepharoplasty, 6 cases of augmentation rhinoplasty, 2 cases of autologous fat transplantation and 1 case of augmentation genioplasty. 36 patients were satisfied with the final facial contour and appearance. No severe complications were seen in our series. Facial skeletal contouring surgeries can drastically and permanently change the patient's facial contour. Plastic surgeons should be acquainted with the metabolic aesthetic trends and be familiar with all the surgical techniques. The selection of an appropriate procedure or combined procedures for individual patients should be made according to the cultural background, patient's chief complain, anatomic variations and possible operative sequelae.

KEY WORDS

facial contouring surgery; reduction malarplasty; reduction angleplasty; aesthetic surgery

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Asians usually show the typical craniofacial characteristics of brachycephaly^[1]. The facial skeletal contours of Asians are shorter and wider than those of Caucasians^[2]. These facial features will be enlarged if the patients have square middle and lower facial contour caused by prominent zygomatic complex and prominent mandibular angle. Patients with square middle and lower facial contour always show masculine temperament. However eastern traditional aesthetic view deems that women with ovoid and slender faces are beautiful. Facial contouring surgery is the strongest intrapsychic desire among the patients with square facial contour^[3]. Conventional facial skeletal contouring surgeries include reduction malarplasty and reduction angleplasty, which appropriate for prominent zygomatic body and arch and prominent mandibular angle respectively. In the meantime, there are other facial aesthetic problems among these patients such as single eyelids, lower nasal dorsum, microgenia and facial asymmetry and so on. These facial deficiencies are common among Asians. With the international migration and the improved economy, largely increasing patients receive facial skeletal contouring surgery combined with other facial aesthetic surgeries. These popular

esthetic surgeries include double eyelid blepharoplasty, augmentation rhinoplasty, augmentation genioplasty, autologous fat transplantation and the like.

MATERIALS AND METHODS

From January 2014 to December 2016, a total of 37 patients underwent facial skeletal contouring surgery combined with other esthetic surgeries by the authors. All patients were females ranged in age from 20 to 33 years with an average age of 25.5 years. All patients were healthy and their purposes of surgery were purely improving the facial contour. None of the patients had malocclusion and temporal mandibular joint dysfunction. The chief complaints were prominent middle facial contour (12 patients), prominent inferior facial contour (16 patients), both prominent middle and inferior facial contour (6 patients), asymmetry (3 patients). These 37 cases underwent reduction malarplasty, reduction angleplasty, reduction malarplasty and reduction angleplasty, unilateral malar or mandibular osteotomy respectively. Some of these patients complained concomitant cosmetic problems. Those were 4 cases of single eyelids, 4 cases of lower

Table 1: 37 cases of facial skeletal contouring surgeries combined with aesthetic surgeries.

Tapes	blepharoplasty	rhinoplasty	fat transplantation	genioplasty	Total
malarplasty	2	4	1	1	12
angleplasty	2		1		16
malarplasty + angle-plasty		2			6
asymmetry					3
Total	4	6	2	1	37

nasal dorsum, 2 cases of dissatisfaction with primary rhinoplasty, 2 cases of temporal depression and 1 case of microgenia. They all received personalized intraoperative or postoperative aesthetic surgeries (Tab. 1).

Preoperative preparation included communication with patients, conventional physical examination and taking medical photographs. Every individual desire was listened to patiently. The present facial contour was explained to the patient. Changes of the mandibular or malar shape and the anticipated contour of the postoperative face were usually demonstrated using a 3D craniofacial specimen. If concurrent procedures were chosen, effectiveness of each aesthetic surgery and the precedence order of the surgeries were explained to the patients in detail. Inspection and palpation were needed to evaluate the facial contour, the bony construction, soft tissues and protrusion of the gonion angle. Panoramic view and 3D CT was helpful for deciding the osteotomy line. Medical photographs were taken from the frontal and the lateral side. Then the informed consent was obtained.

SURGICAL PROCEDURE

All patients underwent general anesthesia through nasotracheal intubation. 0.25% lidocaine with 1:200000 epinephrine was infiltrated within the operative regions.

The modified L-shape osteotomy was used for malarplasty. The lidocaine liquor was first injected transcutaneously onto the periosteum of the malar body and arch. Then it was injected along the incision intraorally. A 4 to 5mm longitudinal temporal incision was made behind the sideburn hairline. The posterior subperiosteal portion of the zygomatic arch was reached by blunt dissection using an ophthalmic tissue scissors. Osteotomy was performed using a reciprocating saw from posteroinferior to anterosuperior side of the root of the zygomatic arch. Then an intraoral labiobuccal vestibular

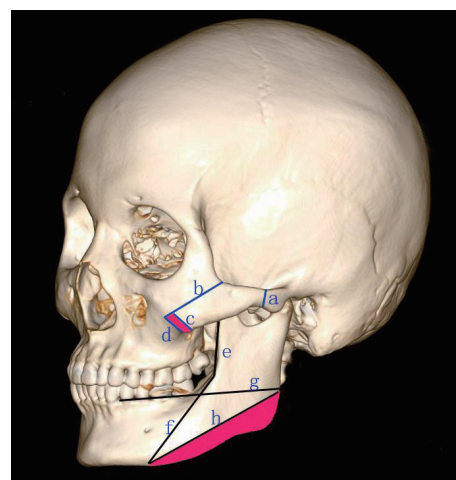


Fig. 1 Illustration depicting the curvilinear osteotomy line. Line a: osteotomy line of zygomatic arch. Line b: oblique osteotomy line. Line c: the first vertical osteotomy line on the zygomatic body. Line d: the second vertical osteotomy line was 3-6mm parallel to the first vertical line, red part is the bone segment. Line e is drawn along the anterior border of the ramus and it turned off from the occlusal plane to the inferior border of the mandibular body just below the mental foramen (Line f). Line g is parallel to the superior border of the mandibular body. Red part beneath line h is angle bone segment.

incision down to the periosteum was made from the bilateral canine fossae to the first molars. Subperiosteal undermining was performed on the anteroinferior part of the maxilla, the zygomatic body, and the anterior two-thirds of the zygomatic arch. The oblique osteotomy was performed by a reciprocating saw (Fig. 1). The osteotomy line was about 1cm below the inferolateral part of the infraorbital margin and approximately parallel to the lower margin of the zygomatic body. The first vertical osteotomy line of the L-shape osteotomy was made perpendicular to the oblique osteotomy line interior to the malar prominence on the zygomatic body. The second vertical osteotomy line was 3-6mm parallel to the first vertical line according to the severity of malar prominence (Fig. 1). The middle full-thickness bone segment between the two vertical osteotomy lines was removed. The freed zygomatic complex then can be repositioned medially and rigid interosseous fixations were performed by microplates

and microscrews. Bone beside the osteotomy lines was burred to smoothness regularly.

The angleplasty was also modified based on our technique reported^[3]. The lidocaine liquor was first injected transcutaneously into the masseter muscles adhering to the mandibular ramus and mandibular angle. Then it was injected along the incision intraorally. An intraoral incision in the mucous membrane on the labial side of the buccal sulcus was made running from the anterior edge of the ascending ramus of the mandible to the second mandibular premolar tooth. Subperiosteal undermining was done from the posterior to the inferior margin of the mandible. The masseter muscle together with the medial pterygoid muscle was detached from the angle using a curved periosteal elevator. Then the inferior part of the ramus, the body of the mandible and the gonion angle were exposed. A broken line was drawn along the anterior border of the ramus and it turned off from the occlusal plane to the inferior border of the mandibular body just below the mental foramen (Fig. 1). Another line was located and parallel to the superior border of the mandibular body. The points where each of the two lines met the posterior and inferior border of the mandible were connected to form the osteotomy line of angleplasty (Fig. 1). Then the osteotomy was performed using a reciprocating saw.

The same procedure was repeated on the opposite side. Incisions were irrigated with diluted iodophors and saline. Suction drains with sustained negative pressure produced by 20 ml syringes were kept subperiosteally for 24 hours. The intraoral and extraoral incisions were closed. Bulky compressive cotton dressings were maintained for 3 days.

Then elastic mask dressings were applied. If reduction malarplasty and angleplasty were concurrent, malarplasty was preferential.

Total of 13 patients underwent facial aesthetic surgeries respectively according to their wishes. Those were 4 cases of double eyelid blepharoplasty, 4 cases of augmentation rhinoplasty using silicone implant, 2 cases of revision rhinoplasty using autologous costal cartilage, 2 cases of autologous fat transplantation and one augmentation genioplasty (Tab. 1). One case of blepharoplasty was carried out by local anesthesia prior to the angleplasty by general anesthesia. One case of fat transplantation was performed next to malarplasty. Else were done 3 to 6 (or more) months after facial contouring surgery.

RESULTS

The aesthetic results, as estimated by both patients and our surgical team subjectively, were satisfactory in 36 of 37 cases during the follow up period of three months to three years. The square-shaped appearance was converted to an ovoid, slender and feminine facial contour from the frontal view. In the profiled view, the prominent mandibular angles were natural and smooth (Fig. 2~4). One patient underwent bilateral reduction angleplasty and ostectomy of the inferior edge of right mandibular body for her facial asymmetry. She complained the facial asymmetry postsurgical 10 months. But the asymmetry was more acceptable when she was followed 18 months after surgery (Fig. 5). Hematoma, infection, soft tissue drooping, severe swelling and other severe complications such as subcondylar fracture and massive bleeding were not seen in our series.

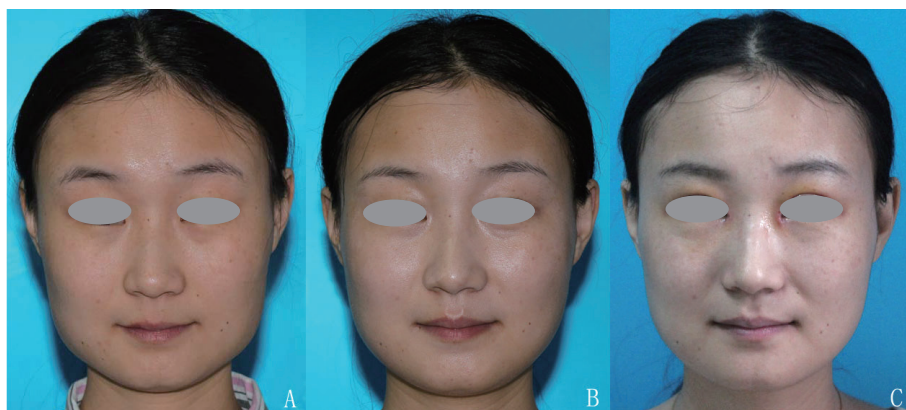


Fig. 2: Case 1. A 24-year-old woman with prominent mandibular angle. A: The preoperative frontal view showed a square face. B: Frontal view postoperative six months. The square face was converted to an ovoid, slender and feminine facial contour. C: She received blepharoplasty and endocanthal plasty seven months after reduction angleplasty.



Fig. 3 : Case 2. A 25-year-old woman with protrusion of malar bone and microgenia. She underwent reduction malarplasty and augmentation genioplasty using silicone implant. A-D: preoperation. E-H: one week postoperation.

DISCUSSION

The term "Asian" is always confined to the inhabitants in most of the south-east Asian countries^[4-6]. The ethnic characteristic can be identified as Han nationality of Chinese. The distinct facial anatomical features of Asians and cultural backgrounds and aesthetic views are vastly different from those of Caucasians. Single-fold eyelid with vesicular eyes and saddle noses are the common ethnic facial features of Asians as mongoloid race. Aesthetic surgeries bloomed over the past couple of decades with the rapid economic development of Asian counties especially in china. Upper blepharoplasty and augmentation rhinoplasty are the top 2 aesthetic surgeries in Asian counties nowadays^[6]. Patients underwent facial contouring surgeries usually seek for cosmetic improvement to achieve more beautiful and harmonious facial appearances before or after contouring surgery. The aesthetic surgical procedures are also different from those for Caucasians^[6, 7]. However, the clashes of western culture and resultant cultural intermingling between the east and west have changed the concept of oriental beauty and the aesthetic views^[8]. It is the intent of the author to summarize the experiences of combination of facial skeletal contouring surgery and aesthetic surgeries



Fig. 4: Case 3. A 21-year-old woman with protrusion of malar bone and primary rhinoplasty (A, C). She was not satisfied with the primary rhinoplasty performed in other hospital. The implant was taken out and costal cartilage augmentation rhinoplasty (B, D) was performed concurrently one year after reduction malarplasty.



Fig. 5: Case 4. A 21-year-old woman with facial asymmetry. She underwent bilateral reduction angleplasty and osteotomy of the inferior edge of right mandibular body (A). B: She complained the facial asymmetry postoperative 1 month. C: postoperative 10 months. D: The asymmetry was more acceptable postoperative 20 months. Asymmetry of angulus oris caused the visual discrepancy

for Asians.

Since Onizuka^[9] first described the method of chiseling and shaving the zygomatic body and arch through the intraoral approach, a variety of methods had developed for reduction of prominent zygomatic complex. L-shape osteotomy of malarplasty was one of the techniques suitable for Asian facial contouring surgery^[10, 11]. One major modification of our technique was that bringing forward the osteotomy of malar arch to the first step in comparison with the mentioned literatures. Different from using osteotome, osteotomy of malar arch was performed by a reciprocating saw though a minimal incision about 5 mm's length in the hair line of temporal area. Direction of the reciprocating saw was manipulated from posteroinferior to anterosuperior side of the zygomatic arch after tumescent injection on the arch. Injury of the facial nerve could be avoided. The L-shape osteotomy was performed by two vertical and one oblique osteotomy line at the zygomatic body. The thickness of bone segment was determined by the protrusion of the zygomatic body. The L-shape osteotomy had been performed more frequently because it has the advantages of simple manipulation, natural zygomatic contour and exact control over the amount of reduction^[12].

Intraoral curved osteotomy of mandibular angle was the conventional technique of angleplasty by our team^[3]. Patients with square facial contour were eager for not only the lateral angle reduction but also the frontal view of lower facial width. The curvilinear osteotomy line^[3] was extended to the inferior border of the mandibular body just beneath the mental foramen (Fig. 1). A round bur was used to reduce the outer cortex thickness of the inferior part of the ramus and the mandible body, especially in the outer oblique line of the mandible. The mental nerve need to be protected during osteotomy. The osteotomy was performed by reciprocating saws instead of long-shaft burr drills and arcuate reciprocating rasps

^[3]. However, in some microgenia patients, resection of the mandibular angle alone did not make the lateral facial contour perfect. Augmentation genioplasty using silicone implants was a simple and practicable technique to solve this problem. The curvilinear osteotomy line must not exceed beyond the mandibular body below the mental foramen and the posterior margin of the silicone implant should be trimmed papery. Otherwise a wide chin will be presented.

Both the facial contour and the original harmony of the face changed after facial contouring surgery. Nose stood in the breach because nose was the most important aesthetic unit on the face in oriental aesthetic culture. Before facial contouring surgery, more than half of our patients received primary rhinoplasty in other hospitals. All the augmentation rhinoplasties were performed by silicone implants. Silicone implant had been commonly used because of its placement under thick skin, easy sizing, and low cost^[13]. Silicone implants were also used in two thirds of our 6 rhinoplasties. We used straight silicone implant to augment nasal dorsum. The nasal tip was augmented using conchal or septal cartilage. L-shape implants were never used in our consecutive cases to avoid the possibility of pressure necrosis and extrusion at the tip area^[5]. Although antecedent rhinoplasty has no effect on the osteotomy procedure, the best time frame for rhinoplasty was three to six months after facial contouring surgery. Thus the nasal contour would be designed suit for the changed facial contour. Two patients of our 6 rhinoplasties underwent augmentation rhinoplasty using silicone implant in other hospitals. They were not satisfied with the height of nasal dorsum (Fig. 4). The implants were taken out and costal cartilage augmentation rhinoplasty^[8, 13] was performed concurrently. In our opinion, using of autologous grafting material in simultaneous revision surgery could receive safe and satisfactory results.

Asian patients desired obvious changes after facial

contouring surgery. They were eager for higher nasal dorsum and wider eyelid creases. But Asian patients still wanted to preserve their ethnic characteristics by refining their Asian features. Blepharoplasty was the most common cosmetic surgery the oriental women desired. Many literatures^[14-16] described the surgical technique for Asians. External incisional techniques^[4] were used for the single eyelid or low eyelid crease patients in our series. The new double eyelid creases must be designed personally before operation. The widths from the eyelid crease to the eyelashes usually were 7-8 mm according to each facial contour. Endocanthal plasty usually was needed among Asians. The double eyelid surgery was also performed three to six months after the facial contouring surgery. But minority girls wanted to kill two birds with one stone. One case of our blepharoplasty was carried out by local anesthesia prior to the mandibular osteotomy by general anesthesia. Besides skeletal contouring surgery, facial rejuvenation by autologous fat grafting became more and more popular in Asian countries. One case of complementary autologous fat grafting was performed to plump local facial contour during the facial contouring surgery and another case was performed one year later. 3M3L technique^[17] which suited for Asians was applied in the two cases and we have no more modification.

CONCLUSIONS

Facial skeletal contouring surgeries like reduction angleplasty and reduction malarplasty are popular in Asian countries. Patients usually seek for other facial aesthetic surgeries. Plastic surgeons should be acquainted with the metabolic aesthetic trends in Asians and provide the optimized surgical plans to the patients. The selection of an appropriate procedure or combined procedures for individual patients should be chosen according to the cultural background, patient's chief complain, anatomic variations and possible operative sequelae.

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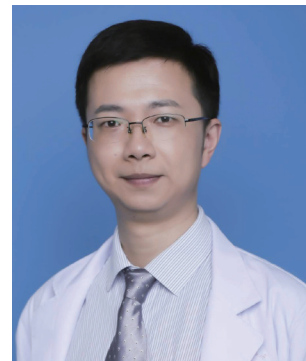
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Ethical approval: Not required

Level of Evidence: Level IV, clinical case study

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