

광대뼈 축소술에 있어서 재배치와 고정

황소민¹ · 송제니퍼김¹ · 백세민² · 백릉민³

좋은문화병원 미용성형재건센터¹, 세민성형외과², 서울대학교 의과대학 성형외과³

Modified Approach in Reduction Malarplasty for Repositioning and Fixation

So Min Hwang, M.D.¹, Jennifer Kim Song, M.D.¹,
Se Min Baek, M.D.², Rong Min Baek, M.D.³

¹Department of Plastic & Reconstructive Surgery, Good Moonhwa Hospital, Busan; ²Semin Plastic Surgery,

³Department of Plastic & Reconstructive Surgery, Seoul National University Hospital, Seoul, Korea

Purpose: It has always been an aspiration for Asians to look more balanced and feminine, considering their facial features regarding relatively flat midface with marked prominences of the zygoma. Many studies have been dealt in this subject. However, the authors would like to emphasize the concept and introduce the technique of repositioning of the malar complex to a cosmetically beneficial point and stationing it on proper position by fixation on zygoma body and arch.

Methods: From January 1998 to December 2007, this method was performed in 50 patients of mild to moderate prominence and malposition of the malar complex. A simplified technique of lateral orbital osteotomy and oblique osteotomy on zygomatic arch through intraoral and preauricular incision was developed. Then, liberal malar complex can be moved to a supero-posterior direction and repositioned to a more cosmetically beneficial point. To maintain the stationed position and to protect from vector affected by the attached masticating muscle to zygomatic bone, fixation was done on both zygoma body and arch.

Results: We have obtained satisfactory results using this procedure without any observable complications. The advantages of this procedure are proper exposure, inconspicuous scar, safe, more natural contour, improved stability, and shorter healing time.

Conclusion: The authors suggest that reduction malar-

plasty should be approached with underlying concept of repositioning and fixation. In mild moderate malar prominent cases, our technique will provide with maintenance of aesthetic concept, equal to the malar reduction performed under coronal approach and provide with more natural facial contour with stability even with less invasive surgical approach.

Key Words: Malar reduction, Malar complex, Reposition, Fixation

I. INTRODUCTION

Understanding the nature and meaning of beauty is quite different between the Western and the Orient. Contrast to the Western concept of beauty, where well defined and prominent cheek bones are important in facial aesthetics, malar prominences are considered an unpleasant and undesirable feature in Asia because they generate a flat, wide and masculine appearance. This is the reason why the requests for the malar reduction are fairly common in Asia, although rare in the West where demands for malar augmentation are predominant. Several techniques for reduction malarplasty have been reported according to various methods of approach, reduction, and fixation. Each technique has its drawbacks as well as its merits. But all techniques should carry the important concept of 'repositioning of mobile malar complex to a more cosmetically beneficial point' and 'fixation of bone on body and arch'.

In 1984, the authors developed a new method^{1,2} of reduction malarplasty which consisted of medial and lateral malar osteotomies; repositioning of the mobilized malar complex, and fixation of bone to body and arch through coronal approach. The potential merits of this procedure are focused on precise and predictable malar reduction, simplicity of maintaining symmetry, reduction and repositioning of mobile malar complex to a more cosmetically beneficial point, preservation of the malar contour and curvature, and finally, maintenance of stability. Further more, it can be performed with concomitant aesthetic operations; such as forehead lift,

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Address Correspondence: So Min Hwang, M.D., Department of Plastic & Reconstructive Surgery, Good Moonhwa Hospital, 899-8 Beumil 2-dong, Dong-gu, Busan 601-803, Korea. Tel: 051) 630-0198 / Fax: 051) 630-0145 / E-mail: sominhwang@hanmail.net

frontal or orbital rim contouring, etc. The results of this procedure have been extremely satisfactory with minimal complications. However, this method is performed through coronal approach, concerning many aesthetic surgeons regarding long visible scalp scar and extensive operation.

In an effort to supplement such drawbacks, the authors applied a modified approach in reduction malarplasty for repositioning and fixation, capturing the above concepts while simplifying the operative procedure through preauricular and intraoral approaches.

When operating on patients with mild to moderate prominence and malposition of malar complex scheduled for malar reduction without combined aesthetic operation, author's technique will provide you with a securing result.

II. MATERIALS AND METHODS

PATIENTS

From January 1998 to December 2007, modified approach in reduction malarplasty for repositioning and fixation reduction consisting of medial and lateral malar osteotomy, repositioning of mobile malar complex, and fixation of bone to the body and arch through preauricular and intraoral incisions, was performed in 50 patients of mild to moderate prominence and malposition of the malar complex.

No patients had previous history of trauma or other pathological findings, except one patient with post-traumatic asymmetry of the zygoma. Male to female gender ratio of the patients was 2 to 48 (M:F=2:48). The ages ranged from 19 to 36 with the mean of 24.5 years. The follow-up period was 6 to 28 months, with the mean of 15.5 months. A reduction malarplasty was performed with concomitant reduction mandibular angleplasty in 20 patients.

SURGICAL PROCEDURE

Along with thorough clinical assessments, preoperative clinical photographs, cephalometric and submentovortex radiographs were taken to precisely measure the symmetry of the malar complex and to determine the extent of the bony reduction.

The operation was performed under general anesthesia with endotracheal intubation, and was started with local infiltration of 2% lidocaine mixed with epinephrine (1:200,000) along the intraoral incision line, the upper labiobuccal sulcus. A 3-cm-long upper buccal sulcus incision was made from the canine to the molar area extended down to the subperiosteal level for

superioposterior dissection. The dissection proceeds up to the inferior orbital margin and anterior portion of the zygomatic arch.

Approximately 3-cm-long preauricular incision was made directly above the zygomatic arch. The dissection continued on subperiosteal plane of the zygomatic arch not to injure the superficial temporal vessel and facial nerve branches. In the course of dissection, direct communication between the previous intraoral subperiosteal pocket and preauricular subperiosteal plane of the zygomatic arch was created. Excluding the osteomized area, the insertion site of the temporalis fascia and the masseter muscle should be preserved as much as possible to maintain the balance of pulling forces and for the nutritional support for the zygomatic bone.

A lateral orbital osteotomy started from the level of the frontozygomatic suture line while preserving the lateral orbital rim. The cutting was done with a reciprocating saw with parallel insertion of the soft tissue protector. Sawing was performed towards the zygomaticomaxillary suture line in the inferoposterior direction. The degree of inclination of the lateral orbital osteotomy determines the direction and the extent of the movement of the mobilized malar complex. After completing the lateral orbital osteotomy, the zygomatic arch was obliquely cut just anterior to the articular tubercle with a small reciprocating saw (Fig. 1). When the malar com

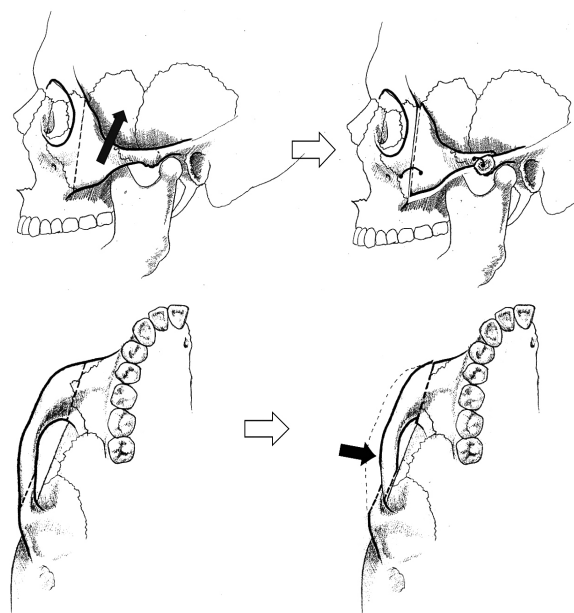


Fig. 1. Superior & posterior repositioning of the mobilized malar complex. Bony Z-plasty on the zygomatic arch maximizes the effect of malar reduction and provides bony contact between the repositioned zygomatic arch segments.

plex is completely liberal, it could be repositioned properly by applying traction force supero-posteriorly (Fig. 1), and/or medially (Fig. 2) as planned. Repositioned malar complex was stationed with fixation with mini-plate and screw on the zygomatic body and interosseous wiring on the transposed osteomized surface

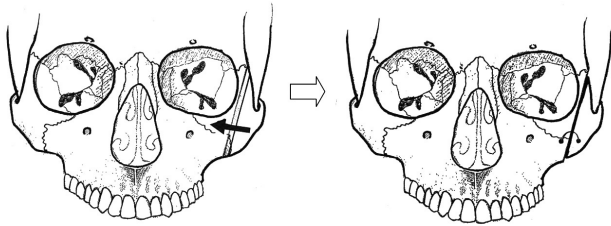


Fig. 2. Medial repositioning of the mobilized malar complex. Note that a strip of the bone is excised to reduce lateral excess.

of the zygomatic arch (Fig. 4).

After repeated saline irrigation of the dissected pocket and careful hemostasis, penrose drain was inserted at the preauricular incision site for prevention of hematoma formation. The mucosal layer and the skin were repaired in a routine manner, followed by Barton's dressing. The operation took 3 hours.

For the immediate postoperative care, the patient were recommended to take liquid to soft diet and extra-caution to avoid any traumatic episode to the zygomatic area for approximately a month. Skin suture stitches were to be removed on the 5th day after the operation.

III. RESULTS

Postoperative results were satisfying in all cases with no significant complication (Fig. 5). There are few advantages of this procedure. Surgeons can obtain proper

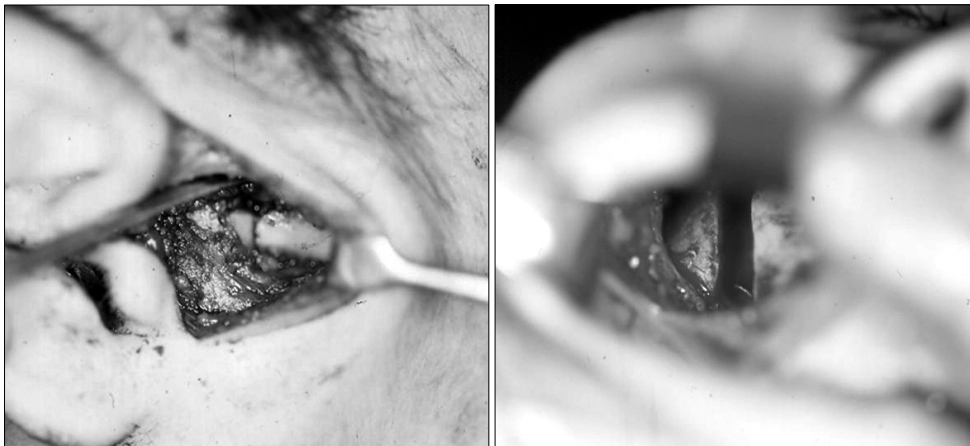


Fig. 3. Oblique osteotomy line from lateral to medial on zygomatic arch (Left) and lateral orbital osteotomy line (Right).



Fig. 4. (Left) Repositioned zygomatic arch is fixed with wiring. (Right) Repositioned body of zygoma is fixed with plate & screw.



Fig. 5. (Above) Preoperative views of a 21-year-old woman with prominent malar complex. (Below) After malar reduction using the malar osteotomy and repositioning technique through preauricular and intraoral incision.

exposure and visualization of the osteotomy sites compatible with bicoronal approach, and at the same time acquire an inconspicuous scar. Moreover, malar complex is safely mobilized with this technique without concern of adjacent structural injury and variably stationed at a desired location and result in more cosmetically satisfying natural facial contour. Fixation to body and arch will provide with improved stability. Overall simplification of the technique will offer shorter healing time.

IV. DISCUSSION

The malar bone is a major determinant of the facial contour, which may be classified as round, oval, long, or quadrangular (square). In the West, high cheek bones

are considered a sign of beauty, and requests for contouring of the malar bones generally take the form of augmentation.^{3,4} In the East, however, malar reduction is most often desired. It is generally understood that the zygoma contouring is commonly acknowledged as an important factor in an aesthetic oval face in both Caucasians and Asians. Hinderer³ stretched the importance of the lateral augmentation as well, and pointed out the importance of the oblique view. This concerns have been emphasized by Agban,⁵ who termed this oblique profile or three-quarters view the "social view". Caucasian is dolichocephalic, so the face is narrower, longer, and with greater anterior projection, where as Asian is mesocephalic, so the face looks wider, shorter, and flat.

The aesthetic face for Asian is different from that of

Caucasian. Pursuit of more appropriate cosmetic facial contour can be more often achieved by reduction malarplasty of the prominent malar complex in Asian population. Due to relative lack of vertical height in Asians, combination of the prominent zygomatic complex, and generally prominent mandibular angle give the face a square appearance.⁶ To resolve this problem of a quadrangular or square face, reduction of the zygomatic contour is indicated with concomitant reduction mandibular angloplasty.

Several methods for reduction malarplasty have been reported focusing on various surgical approaches, modes of reduction, and fixation techniques. Various methods for surgical approach are listed as, coronal,^{1,2,7} intraoral,^{6,8} intraoral combined with the preauricular,^{9,10,11} sideburn¹² approach and etc. Different kinds of reduction are osteotomy,^{1,2,11} green-stick fracture,^{9,10} shaving or chiseling.^{6,12} Fixation techniques are introduced as fixation on body and arch,^{1,2,11} only body fixation⁸ or non-fixation^{9,10} in respect to diverse perspective of the surgeons. Each technique has drawbacks as well as merits.

Previous report regarding the osteotomy of the zygoma in which the concept of cut, move and fix into a better location have been well understood.^{1,2,11} The concept of 'reposition of mobile malar complex to more attractive point' is important because the goal of surgery is not to achieve merely 'flat' malar complex. Thus we advocated repositioning of mobile malar complex superiorly, posteriorly, and/or medially by lateral orbital osteotomy and transpositioning bony z-plasty of the zygomatic arch. This precise procedure, identical to the coronal approach, can be performed in simplified intraoral and preauricular incision. So far, precise osteotomy had been challenging for many surgeons that alternative method of green-stick fracture or chiseling had been attempted. Although these alternative methods provide with relatively acceptable decrease in bizygoma distance, it does not convey the concept of aesthetics or stability. Our technique is built on the foundation that mobile malar complex is possibly fixed to a cosmetically beneficial point even under minimally invasive intraoral and preauricular incision.

Compared to the conventional infracture technique of the arch where stepping of the osteotomy site were palpable in some cases, transpositioning bony Z-plasty at the zygomatic arch provides smooth lateral facial contour and allows safe and easy fixation by interosseous wiring.

The zygoma bone furnishes from the attached masseter, temporalis, zygomaticus and zygomatic head of the

quadratus labii superioris muscles.¹³ Dynamic contraction of the muscles listed above may influence the position of the malar complex.⁷ Among these muscles, the action of the masseter muscle is dominant and results in downward, backward and inward displacement of the mobilized malar complex, as it has broad attachments to the malar eminence. This idea should be kept in mind when freeing the malar complex.

Under the influence of continuous traction due to the action of these muscles, it is impossible to maintain proper stability of the mobile malar complex without rigid fixation. However, to avoid displacement of mobile malar complex, surgeon may attempt for an extensive detachment of the muscles insertion, resulting in cheek droop.¹ These muscles attached to the malar complex should be left intact as much as possible to balance the pulling forces, to preserve the blood supply to the zygomatic bone, and to avoid of cheek drooping. In all of our patients, cheek droop was not found.

To sustain the traction forces of these masticatory muscles and to maintain its aesthetic malar position, fixation is inevitable. While repositioning the mobile malar complex to an aesthetic position, plate and screw fixation on zygoma body and additional interosseous wiring at zygomatic arch will provide with postoperative stability.

As far as known, classification of the malar prominence is not defined in literature. Authors' categorization in degree of malar prominence is marked by the size of the segmental excision performed in lateral orbital zygoma body. Mild malar prominence may successfully perform repositioning without osteotomy. Moderate malar prominence may require less than 4 mm thickness of the osteotomy. Severe malar prominence is defined as cases requiring more than 4~5 mm of segmental excision of the zygoma body, where request for accurate osteotomy may demand for a coronal approach. But in other cases of mild to moderate malar prominence, calculated osteotomy can be acquired through less invasive intraoral and preauricular incision.

V. CONCLUSION

Conventional minimal approach malar reduction methods effectively reduce the malar prominence. But performing malar reduction should not be limited to creating simply flap malar complex, but should focus on the restoration of more aesthetic facial contour. This concept most certainly involves reposition to more aesthetically beneficial point and its fixation.

When operating on patients with severe malar projection, asymmetric malar or the malposition of the zygoma, which or when the patients require simultaneous upper facial cosmetic surgery such as, forehead lift, frontal and orbital rim contouring, coronal approach¹ still lies as the best choice. But, when operating on patients with mild to moderate prominence and malposition of malar complex without combined aesthetic operation, extensiveness of the coronal approach and postoperative long scalp scar may render the patient's decision. In these cases, our technique will provide with maintenance of aesthetic concept, equal to the malar reduction performed under coronal approach and provide with more natural facial contour with stability even with less invasive surgical approach.

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