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A Novel and More Aesthetic Injection Pattern for Malar Cheek Volume Restoration

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Abstract The loss of superior midface contour and projection can be corrected with the use of injectable hyaluronic acid (HA) dermal fillers, however, the most frequently used injection pattern employs a technique which was originally designed for malar implant surgery. Here we describe a novel injection pattern for restoring facial contours with a HA dermal filler inspired by traditional make-up artistry, which includes greater superolateral positioning of injection sites. Importantly, this technique helps injectors avoid creating an excess of volume in the anterior portion of the malar complex. Contributing authors/injectors, who now use this technique exclusively, have found that it has so far provided optimal aesthetic results for hundreds of patients with no observables complications. The malar cheek contributes much to the aesthetic curvature of the face and deserves a thoughtful update for injectable HA, as the traditional technique has never actually been aligned with its medium. In the experience of the contributing authors, this technique helps achieve a greater aesthetic outcome in the correction of midface contour deficiencies and has consistently resulted in high patient satisfaction.

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Background

The use of injectable hyaluronic acid (HA) filler for malar cheek rejuvenation has been practiced for over a decade, although the injection guideline still used by many practitioners (and technical trainers) is an outmoded and misappropriated technique adopted from a malar cheek surgical plan [1, 2]. The approach to midface rejuvenation using fillers has wisely evolved from merely masking the end result of the volume shift (filling of wrinkles and folds) in the lower midface, to a more proactive approach directed at the site of the structural deficit which is the anterolateral portion of the malar cheek. The malar cheek contributes much to the aesthetic curvature of the face, and the current injection patterns deserve a thoughtful update, as this technique has never actually been aligned with its medium.

The structural changes associated with ageing of the midface include gradual zygomatic–maxillary bone resorption and loss of deep medial cheek fat. These processes result in blunting of the malar width and projection, and they diminish the aesthetic "ogee curve" of the cheek [3]. The loss and shift of structural support in the superolateral midface lead to inferior and medial volume shifts and culminates in a more prominent nasolabial fold (NLF) [4, 5]. By first restoring the structural support in the deep

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plane of the malar cheek, added resistance to the inferior volume shift is reestablished which ameliorates the severity of the folds and wrinkles of the lower midface. Ideally, this approach also helps minimize the need for filler (added volume) in the lower midface.

The distribution of fullness in the malar eminence (ME) is a crucial characteristic of the ogee curve, which should provide visible contour from the frontal, lateral, and oblique aspect of the face. Because of its soft tissue structure, the ME may appear in a less distinct form than other facial features, such as the eyes, chin, and nose; as such, its corrective need may be difficult to visualize and plan for. With a youthful cheek, the interplay of light and shadow contributes to the visible contours of the ME. For centuries, make-up artists have defined the ME contour with the application of dark and light-coloured cosmetics. Curiously, aesthetic advancement of ME rejuvenation using filler has adopted the facial reference guidelines designed for maxillofacial surgery rather than the guidelines used by the original practitioners of beauty, the painters, and make-up artists. In this way, injectors have long been using the wrong tool for their task or rather have been misguided by mistaken guidelines.

In the early 1970s, a pre-surgical marking of the malar complex known as Hinderers' lines was introduced and consisted of an intersection defined by two laterally drawn reference lines (Fig. 1a). The intersection marked an approximate anatomically correct position for the ME and used as a guide for the placement of an oval-shaped silicone rubber malar implant between the muscles of the zygomaticus and superior levator [2]. The surgical markings that evolved since that time, such as the Frankfort horizontal plane (Fig. 1b; dashed line), added a vertical reference point in combination with an even greater superolateral positioning of the ME [6, 7]. The revised reference lines were widely adopted and were a considerable aesthetic improvement, as they were more aligned with the "Golden Ratio" (0.80 of the chin-to-eye canthus distance) a metric used by artists throughout history [7]. This repositioning of the ME has since been supported by a culturally diverse population of study subjects with an average distance ratio (chin-to-eye canthus: chin-to-malar prominence) of 0.793 [8].

The strategic advantage of using a filler rather than a pre-defined solid implant for ME enhancement is that an injectable medium lends itself to the creation of more subtle and distributed changes in contour, achieved simply by varying the spacing and quantity of filler. To better serve the versatility of this medium, an injection pattern to enhance ME projection should ultimately be linked to the position and angle of the submalar shallow, the compliment and the inverse of the ME (ogee curve).

In make-up artistry, a technique known as "contouring" describes the application of dark and light make-up colours to create the three-dimensional illusion of greater ME projection [9]. Dark shadowy colours are applied to create the submalar shallow, and light coloured is applied to highlight the superior edge of ME projection (Fig. 2a). In this art form, the traditional primary guideline for defining the angle of the submalar shallow is a line extending from the lateral commissure to the hairline at the top of the ear (Fig. 2a). What all make-up artists have long known is that this particular guideline defines the most aesthetic position for the submalar shallow on a variety different face shapes and subsequently defines the most aesthetic position and distribution for the ME projection.

Presented here is a more contemporary and aesthetic injection pattern inspired by the pearls of traditional make-up artistry and the golden ratio. The pattern includes a broader plotting of the lateral cheek contour line to achieve the best possible aesthetic outcome with the placement of HA filler (Fig. 2b).

This short communication describes reference guidelines and an injection pattern that is consistent with the new

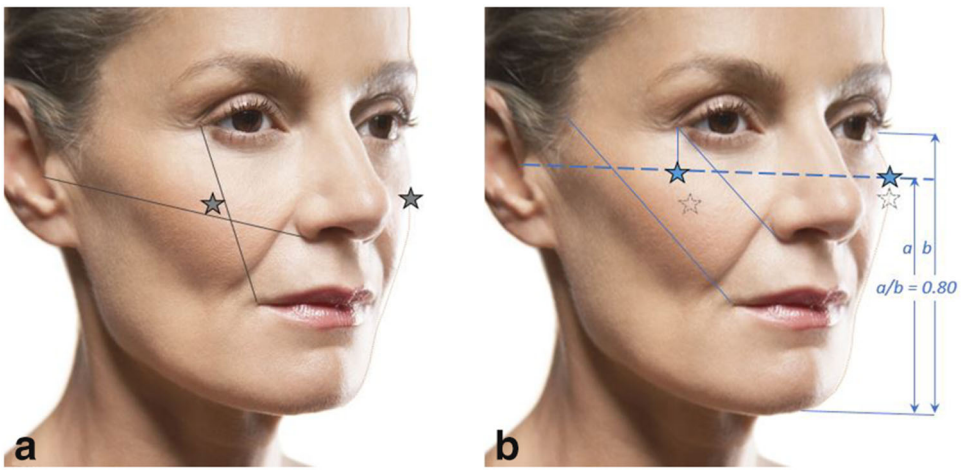

Fig. 1 The ME defined by the intersection of Hinderers' lines (**a**), marked by a grey star, was used as a reference point for positioning of the malar eminence during malar implant surgery. The Frankfort plane (**b**, dashed line), incorporated a vertical metric (chin-to-eye canthus) that elevated the ME (marked by a blue star) to a more superolateral position 0.80 of the chin-to-eye canthus distance (Hinderer's ME in light grey)

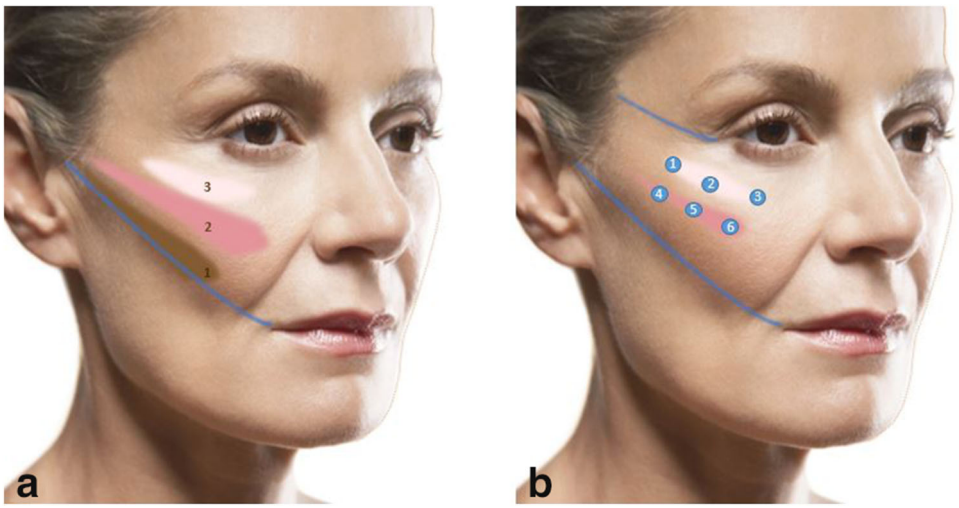

Fig. 2 Make-up has been used for centuries to mimic the contours of the cheek (**a**) and is aligned with a more superolateral positioning of the ME. Dark make-up colours are applied in the submalar shallow (1), and blush and highlight colours are applied to define the ME's inferior (2) and superior edges (3), respectively. A different injection pattern (**b**) which delivers a more aesthetic rejuvenation of the malar cheek using HA fillers is inspired by make-up artists and the golden ratio

paradigm in facial volume restoration (starting with the deeper planes first) using a high G′, large particle HA gel with lidocaine designed for cheek augmentation and correction of age-related midface contour deficiencies [10].

Description of the Technique

An initial assessment of the lateral, medial, and submalar areas is made to determine the location of greatest volume deficit. In general, volume loss is often greatest in the lateral areas of the face, with remaining volume distributed more medially and inferiorly. By adding filler to the superolateral sites first, the contour of the existing anteromalar volume is given width and balance, and a more effective evaluation of any medial volume deficit can then be made.

A lifting of the existing anteromalar and submalar volume overlying the zygomatic bone is achieved using two rows of a three-point lateral-to-medial distribution of injections spanning the width of the malar projection (Fig. 2b). A zone demarcating the entire malar area is traced with two lines. One line extends from the lateral oral commissure to the hairline at the groove between the ear and the side of the head. Another line extends from the lateral canthus of the eye to the hairline approximately 1 inch above the groove of the ear (Fig. 2b). In addition, premarking the region of the infraorbital artery (not shown here) is an important precaution, as the injections move in a medial direction.

A series of six supraperiosteal depot injections of 0.1–0.2 mL are administered with a 27-G needle, in a lateral-to-medial pattern. The injection sequence begins with the superior row of markings (#1–3) and finishes with the inferior row of markings (#4–6) (Fig. 2b). In the experience of the contributing authors, the optimal total volume of filler for each side of the face is $\sim$ 1 mL. Injections should be administered slowly while keeping the needle tip moving. A reflux manoeuvre should be used with each injection to avoid inadvertent intravascular injection. Elevating the tissue away from the bone with the non-injecting hand also helps keep the injection area slightly taut.

This injection pattern has been used exclusively for the last several years by the contributing authors who routinely treat patients for upper midface rejuvenation. The frequency of their practice using this injection pattern easily exceeds 500 patients a year, with no observable complications to date. Figures 3 and 4 show patients who have been injected using the technique described to enhance the superolateral aspect of the malar cheek.

Discussion

The contributing authors believe this novel injection pattern has greater aesthetic advantages than the pre-surgical marking introduced by Hinderer, which does not provide adequate information for an injector and may cause misplacement of excess filler in the anterior portion of the malar complex. It has been shown with three-dimensional surface analysis that filler injected in the deep medial cheek results in greater anterior projection at the medial and inferior perimeters of the fat compartment than anticipated [11]. The topographic changes showed a trapezoid-shaped area of volume with its base at the nasal-cheek junction, rather than a volumization spreading equally in all directions from the injection site.

By using a guideline drawn from the oral commissure to the top of the ear, a more mathematically beautiful cheek with a wider angle anteriorly and a narrower angle posteriorly is defined. A wider injection pattern with extra

Fig. 3 Patient's malar cheek before and after treatment using an injection pattern with superolateral positioning. Before (**a**) and 4 weeks posttreatment (**b**) with 1 mL of a high G′ HA filler on each side and 60 U of abobotulinumtoxin A in each masseter

Fig. 4 Patient's malar cheek before and after treatment using an injection pattern with superolateral positioning. Before (**a**) and 4 weeks posttreatment (**b**) with 1 mL of a high G′ HA filler on each side

injection points at the depth of the supraperiosteum also provides a more comprehensive structure needed to restore support and for repositioning of the existing anteromalar and submalar volumes.

Importantly, the selection of a high G′ (firmer) gel provides the lift and the durability needed to withstand the compressive forces of the supraperiosteal implant depth. Just as product selection is recognized as an important contribution to the aesthetic outcome, the techniques used to inject those products also deserve consideration. There is much to be learned from the ingenuity of artists, as they are the original practitioners of the aesthetic form. In the experience of the contributing authors, this technique helps achieve a greater aesthetic outcome in cheek augmentation and correction of midface contour deficiencies and has consistently resulted in high patient satisfaction.

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References

1. Narurkar VA, Cohen JL, Dayan S et al (2016) Comprehensive approach to multimodal facial aesthetic treatment: injection techniques and treatment characteristics from the HARMONY study. Dermatol Surg 42(Suppl 2):S177–S191
2. Hinderer UT (1975) Malar implants for improvement of the facial appearance. Plast Reconstr Surg 56:157–165
3. Little WJ (2000) Volumetric perceptions in midfacial aging with altered priorities for rejuvenation. Plast Reconstr Surg 105:252–264
4. Rohrich RJ, Pessa JE, Ristow B (2008) The youthful cheek and the deep medial fat compartment. Plast Reconstr Surg 121:2107–2112
5. Sadick NS, Dorizas AS, Krueger N, Nassar AH (2015) The facial adipose system: its role in facial aging and approaches to volume restoration. Dermatol Surg 41(Suppl 1):S333–S339
6. Powell NB, Riley RW, Laub DR (1988) A new approach to evaluation and surgery of the malar complex. Ann Plast Surg 20:206–214
7. Prendergast M, Schoenrock LD (1989) Malar augmentation. Patient classification and placement. Arch Otolaryngol Head Neck Surg 115:964–969
8. Kaptein YE, Kaptei JS, Markarian A (2015) Vertical localization of the malar prominence. Plast Reconstr Surg Glob Open 8;3(6):e411
9. Morris R (2015) Makeup masterclass. Rae Morris Pty Limited, Sydney
10. Weiss RA, Moradi A, Bank D, Few J et al (2016) Effectiveness and safety of large gel particle hyaluronic acid with lidocaine for correction of midface volume deficit or contour deficiency. Dermatol Surg 42:699–709
11. Stern CS, Schreiber JE, Surek CC, Garfein ES, Jelks EB, Jelks GW, Tepper OM (2016) Three-dimensional topographic surface changes in response to compartmental volumization of the medial cheek: defining a malar augmentation zone. Plast Reconstr Surg 137(5):1401–1408