

A New Approach in the Correction of the Midcheek Groove: The Liquid Malar-lift Technique

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Summary: The liquid malar-lift technique describes an approach to correct the midcheek groove by injecting monophasic cross-linked hyaluronic acid into the deep medial cheek fat, deep lateral cheek fat, and the superficial fat compartments, that is the superficial medial cheek fat and superficial middle cheek fat, respectively. The selective volume loss in the deep fat compartments of the face with aging is restored with the liquid malar-lift technique, and the midcheek groove is corrected in harmony with the patient's unique facial anatomy. (*Plast Reconstr Surg Glob Open* 2020;8:e2876; doi: [10.1097/GOX.0000000000002876](https://doi.org/10.1097/GOX.0000000000002876); Published online 25 June 2020.)

INTRODUCTION

The midcheek groove, which becomes prominent with aging and leads to a tired look in the face, is a linear depression that divides the anterior cheek obliquely into malar and nasolabial segments. The volume loss in the bony and soft tissue structures of the face as a result of aging induces the formation of midcheek grooves and concave facial contours.^{1,2} The midface is a multilayered structure that contains superficial and deep fat compartments. The fat compartments in the midface play an important role both in the definition of the facial contours and in the development of various topographic changes like sagging, grooving, and flattening.² The midcheek groove, one of the most frequently encountered topographic problems in the midface, can be corrected successfully with filler application using the liquid malar-lift technique, which involves injection first into the deep fat compartments [deep medial cheek fat (DMCF), deep lateral cheek fat (DLCF)] and then into the superficial fat compartments [superficial medial cheek fat (SmedialCF), superficial middle cheek fat (SMiddleCF)]. The liquid malar-lift technique has certain advantages over other filler techniques correcting the same problem.

MATERIALS AND METHODS

The liquid malar-lift technique has been applied in 64 patients (49 women and 15 men) between 2017 and 2020. The age distribution of the patients was between 25 and 60 years. Of these patients, magnetic resonance imaging

(MRI) was performed in a 32-year-old man to evaluate the location of the filler and to make an objective measurement of the effect of the filler. Linear depressions (the midcheek grooves) on both sides of the midface, starting from the nasojugal groove and extending inferolaterally to the buccal region were noted, and the patient was photographed in an upright position. The midcheek groove on the right side was observed to be deeper than that on the left side.

The point 2 cm lateral to the junction of the vertical line passing through the lateral orbital rim and the horizontal line passing through the subnasale point was marked as the cannula insertion point.

Care should be taken not to pierce the facial vein with the cannula. The facial vein arrives at the injection site after passing under the zygomaticus major muscle. It crosses the deep fat tissue overlying the levator labii superioris muscle and runs along the anterior border of the suborbicularis oculis fat in the malar septum. Another structure of interest is the infraorbital nerve, which exits the infraorbital foramen and is thereafter enclosed in a fascial sheet together with the infraorbital artery and vein.³ For a safe filler application, it is noteworthy that the medial border of the DMCF is formed by this fascial sheet. On the other hand, it should be taken into account that the angular vein forms the lateral border of the DMCF and the medial border of the DLCF.³ Filler application into the superficial fat compartments using a cannula is relatively a safe procedure.

Monophasic cross-linked hyaluronic acid (24 mg/mL) was used as the filler in this procedure. The skin was cleaned with alcohol. Local anesthesia was applied with intradermal injection of 0.1 ml of 2% lidocaine at the cannula insertion point. After 10 minutes, the insertion path for the cannula was cleaved with a 21-gauge needle guide. A 22G 50-mm cannula was inserted and advanced toward the maxillary bone and a bolus of 0.4 mL filler was injected supraperiosteally to the first injection point, the DMCF (Fig. 1). The cannula was then slightly drawn back and

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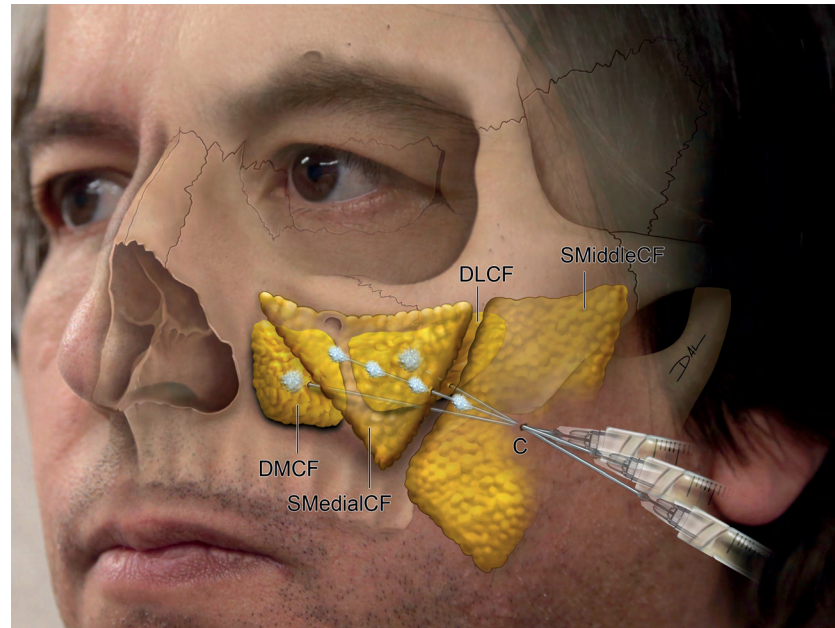


Fig. 1. The malar-lift technique is characterized by injection of hyaluronic acid filler in the order of DMCF (bolus injection), DLCF (adjacent small bolus injections—drops), and superficial fat compartments (retrograde linear injection). The cannula entry point is depicted as point C (Courtesy of DAL, Medical Pixel Illustrations).

then slowly advanced superiorly to the zygomaticomaxillary suture line, and a total amount of 0.4 mL filler was injected supraperiosteally to the second injection point (DLCF) as adjacent 1–3 small bolus injections.

The cannula was then withdrawn from the deep plane and advanced into the superficial plane. Finally, the superficial fat compartments (SMedialCF and SMiddleCF) right under the deepest part of the midcheek groove were injected with 0.1 mL filler in a retrograde linear fashion.

The same procedure was repeated to correct the midcheek groove on the contralateral side. The DMCF (0.2 mL, bolus), DLCF (0.2 mL, adjacent small bolus injections), and the superficial fat compartments (0.1 mL, retrograde linear injection) were injected with fillers, respectively.

A prominent improvement in the midcheek grooves on the right and left sides of the midface was noted from the photographs taken before (Fig. 2A) and 10 days after (Fig. 2B) filler application.

Fat-saturated coronal and axial MRI (3 Tesla; Siemens Skyra, Germany) was performed before and 1 week after filler application to objectively evaluate the efficacy of the liquid malar-lift technique, and various calculations were made on the images.

It was established that the horizontal line passing through the pronasale point bisected the point where the midcheek groove was the deepest. Therefore, the axial cross-section passing through the pronasale was used as a reference for an objective MRI evaluation, and the distance between the anterior wall of the maxillary sinus and skin was measured bilaterally (Fig. 3). Although the pre-filler distance was 1.31 cm on the right and 1.39 cm on the left, the post-filler distance was 1.88 cm on the right and 1.52 cm on the left. As a result, an increase of 5.7 mm (43%) on the

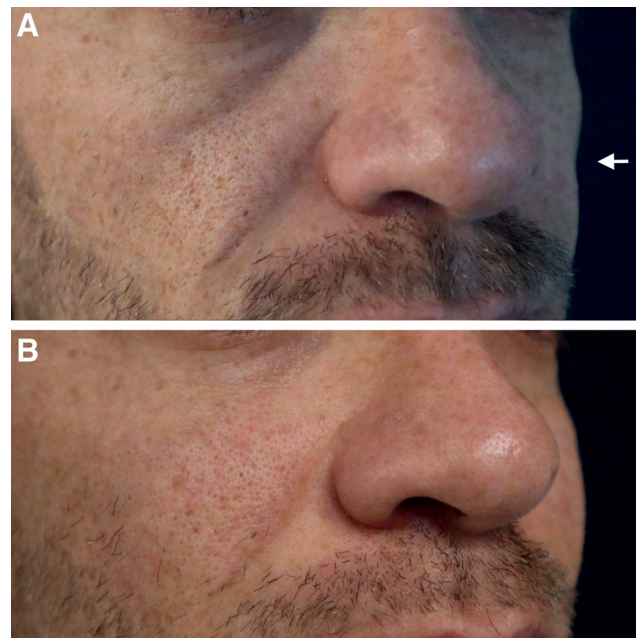


Fig. 2. Before and after photographs. The improvement in the midcheek groove on the right side can be seen in the photograph taken 10 days after the filler injection with the malar-lift technique (B). Likewise, the concavity resulting from the midcheek groove on the left (white arrow) is remarkable (A).

right and 1.3 mm (10%) on the left was achieved with the liquid malar-lift technique. It was confirmed that the filler was injected predominantly over the bone. It was also verified that the filler injected with the liquid malar-lift technique was located in the areas anatomically corresponding

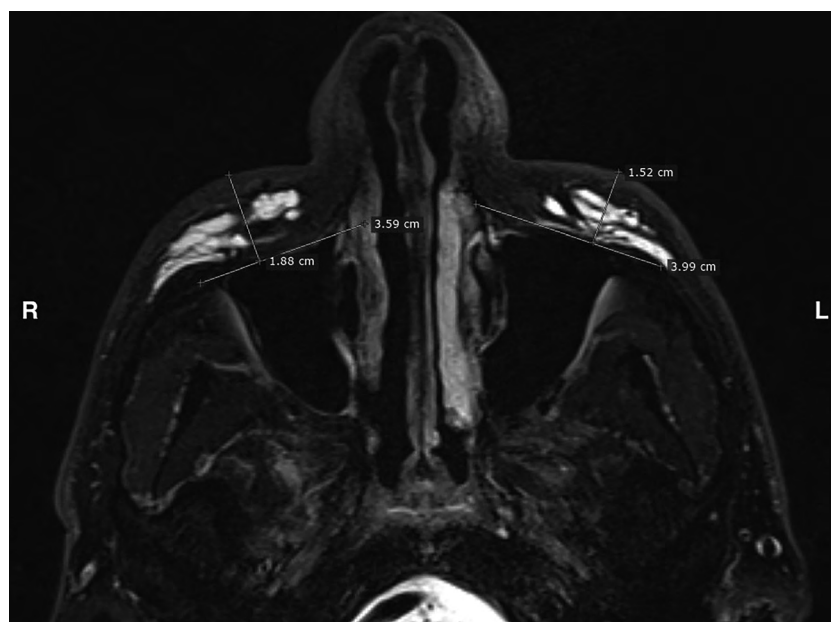


Fig. 3. It is established that the distance between the anterior wall of the maxillary sinus and skin is 1.88mm on the right and 1.52cm on the left and that the filler was injected over the bone.

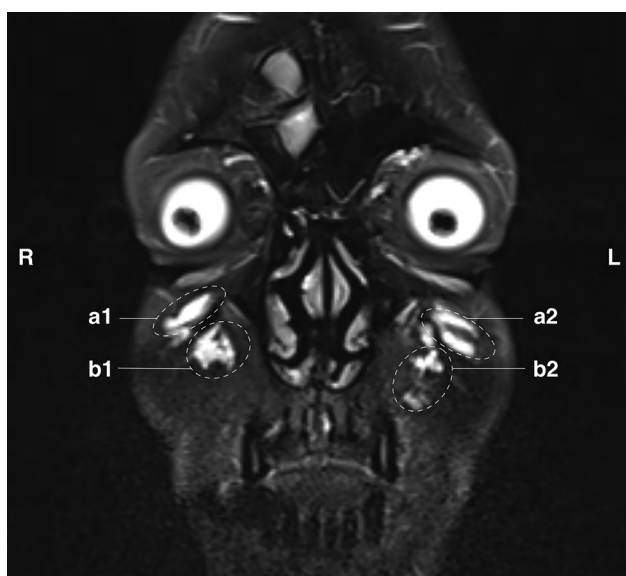


Fig. 4. In the fat-saturated magnetic resonance images in the coronal plane showing the right and left sides of the midface, it was verified that the hyaluronic acid injected with the malar-lift technique was in the locations corresponding to the DMCF (b1 and b2) and DLCF (a1 and a2).

to the DMCF and DLCF in the fat-saturated coronal magnetic resonance images (Fig. 4).

There is a slight difference in the application of the technique with regard to age. The midcheek groove is formed by a deeper deflation of the soft tissues in older patients. Therefore, the injection involves more filler placement in the deep compartments. On the other hand, the superficial compartments, compared with the deep compartments, are

filled with more amount of filler in younger patients. It has been observed that the results obtained with this technique last 12–18 months, which correlates with the duration of action of the filler used in this study.

DISCUSSION

The loss of volume in the deep fat compartments as a result of aging processes decreases the projection of the midface and leads to prominent topographic changes. Studies show that volume loss in the deep cheek fat compartments and the resultant ptosis of the superficial fat compartments lie behind the formation of midcheek grooves and deepened nasolabial grooves and the exacerbation of facial grooves.^{4,5}

Based on results of their study, Rohrich et al⁴ have put forward a theory suggesting that the selective loss of volume in the deep fat compartments with aging resulted in loss of support and ptosis in the superficial fat compartments and that this lead to the ptotic appearance of the aging face. Gierloff et al⁶ proposed that the volume loss in the deep fat pads contributed to the descent of the nasolabial fat and superficial medial cheek, based on their computed tomography (CT) study. These studies support the theory that topographic changes in the midface are due to deflation and volume changes in the deep fat compartments.⁴⁻⁶

Rohrich et al⁴ have documented that augmentation of the deep medial fat increased anterior projection of the midface, diminished the nasolabial fold, corrected the V-deformity, and helped patients regain natural youthful cheeks.

Based on their contrast-enhanced CT study, Cotofana et al³ have demonstrated that, independent of the injected volume, the filler in the deep midfacial fat compartment did not displace inferiorly. This result supports the

concept that filler injections in the deep planes support the overlying structures, increase the anterior projection of the midface, and create a lifting effect on the more superficially located soft tissues.³

The results obtained from scientific and radiologic studies show that it is possible to decrease the severity of the grooving in the midface region by restoring the volume lost in the deep compartments (DMCF, DLCF) with aging.

Filler is applied simultaneously to the deep and superficial fat compartments in the liquid malar-lift technique. Filler is injected first to the DMCF, subsequently to the DLCF, and finally to the superficial fat compartments (SMedialCF, SMiddleCF), which lie directly under the linear depression, that is the midcheek groove. Application of fillers in the DMCF and DLCF provides an increase in the anterior projection of the midface and improves the transition between the anterior and lateral cheek regions.^{6,7}

The accentuation of the midcheek groove as a result of the ptosis in the superficial fat compartments can be decreased by filler injection in the superficial fat compartments. There are certain advantages of the liquid malar-lift technique. The midcheek groove can be corrected in harmony with the unique facial anatomy of the patient, and natural gesture and facial expressions can be preserved because the mainstay of this technique is to restore the loss of volume in the deep fat compartments. Moreover, the fact that the filler injected in the deep midfacial fat compartments does not migrate is another advantage of the liquid malar-lift technique.³

CONCLUSION

The liquid malar-lift technique characterized by hyaluronic acid injection into the deep and superficial fat

compartments for the treatment of the midcheek groove has proved to be a safe and effective method for the restoration of patients' youthfulness in the midface region, yielding satisfactory results.

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PATIENT CONSENT

The patient provided written consent for the use of his image.

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