

# Autologous Fat Grafting to the Chin: A Useful Adjunct in Complete Aesthetic Facial Rejuvenation

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**Summary:** The chin makes up the central unit of the face and neck, and is a significant factor in facial harmony and aesthetics. Historically, correction of microgenia required surgical intervention with a sliding genioplasty, or placement of a permanent implant. However, these techniques require more extensive surgical intervention, prolonged downtime, with higher costs and complications. Furthermore, chin rhytides and descent of chin fat lead to an aged appearance of the chin and lower face that is difficult to correct with a chin implant alone. Autologous fat grafting in facial rejuvenation has expanded in its application and can serve as an effective technique to correct and enhance chin aesthetics, including lateral chin hollowing, asymmetry, mild microgenia, and correction of deep labiomental sulcus or a bifid chin. This article and accompanying video demonstrate the authors' technique for chin augmentation and refinement with autologous fat. (*Plast. Reconstr. Surg.* 142: 921, 2018.)

The chin is a central component of the face and is a significant factor in facial harmony and aesthetics. Historically, microgenia has been addressed with a sliding genioplasty or implants.<sup>1</sup> However, these techniques have associated complications and cost.<sup>2</sup> Furthermore, both techniques involve some type of foreign body to correct chin malposition, and in inexperienced hands, these techniques can be fraught with complications.<sup>2-5</sup>

The above risks associated with correction of microgenia make it relatively prohibitive for the average patient seeking facial rejuvenation. Through our evolution in understanding facial aging and facial fat compartments, volume loss is a significant contributing factor to the aging process.<sup>6-8</sup> The labiomental sulcus deepens with aging, with a component of this being submental fat descent. Autologous fat grafting to the chin can restore a youthful contour to the lower lip.<sup>9</sup>

Autologous fat grafting of the facial fat compartments has demonstrated improved facial aesthetics when performed as an adjunct to face lifting.<sup>10</sup> Despite the increased use of fat grafting to fill the aging face, few reports have described fat grafting as a means for chin augmentation and refinement.<sup>11</sup>

A thorough patient evaluation is performed to define the patient's concerns, and a systematic facial analysis is performed preoperatively to determine what is needed to enhance the facial aesthetics.<sup>6,12-15</sup> When evaluating the lower third of the face, specific evaluation of the lip-chin relationship is undertaken. A vertical plumb line tangential to the vermilion-cutaneous border of the upper lip is drawn and carried inferiorly. In female patients, the chin should be no more than 2 to 3 mm behind this line, whereas in male patients, the chin should project to this line. In patients with an underprojected chin, less than 5 mm behind the ideal chin position, autologous fat is an effective alternative to more invasive genioplasty techniques. Several articles provide

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**Table 1. Graduated Algorithmic Approach to Chin Augmentation\***

Ideal Chin-Lip Plane Distance (mm)	Chin Analysis	Treatment
<7	Asymmetric	Fat augmentation
<7	Symmetric	Fat augmentation vs. chin implant
7–10	Symmetric	Chin implant
>10	Symmetric	Consider genioplasty

\*The preoperative evaluation should determine whether the chin is symmetric or asymmetric and how underprojected the chin is from the ideal chin-lip plane. The chin-lip plane is identified by a vertical plumb line tangential to the vermilion-cutaneous border of the upper lip and carried inferiorly. In female patients, the chin should be no more than 2–3 mm behind this line; in male patients, the chin should project to this line.

a thorough review of all aspects of evaluating the lower face.<sup>4,16–23</sup> These recommendations have been taken into consideration in defining the algorithm for chin augmentation (Table 1).

In addition, fat augmentation of the chin can restore volume loss related to aging and descent of soft tissues without the need for direct excision. Fat augmentation can also serve as an adjunct to soften the marionette lines and chin rhytides that may have developed, as these are signs of aging that are more difficult to correct with traditional surgical rejuvenation techniques. The use of autologous fat also facilitates the correction of asymmetries that cannot be corrected with

an implant alone, and often serial injections may allow for correction of more severe microgenia.<sup>24</sup> Furthermore, autologous fat can be injected radially along the border of the mandible to soften the entire jawline, which cannot be corrected with either osteotomy or an implant.

The subset of patients with severe microgenia will require orthognathic surgery for correction. However, there is a large subset of patients who have a less than ideal chin-lip relationship who would benefit from augmentation of their chin but do not desire or require a surgical intervention with an implant or osteotomy. In this article, we describe a simple and effective technique for minor chin augmentation and aesthetic refinement of the lower third of the face.

## TECHNIQUE

The technique below describes the preferred method for chin augmentation as part of total facial rejuvenation or in rhinoplasty. (See **Video, Supplemental Digital Content 1**, which demonstrates the autologous chin augmentation technique. The approach and technique for fat grafting with access sites at the midline precisely at the point of desired chin augmentation, one for the labiomental crease and two lateral access sites for the lateral chin compartments. Fat is injected with 1-cc cannulas under constant motion with lower pressure until desired



**Video.** Supplemental Digital Content 1 demonstrates the autologous chin augmentation technique. The approach and technique for fat grafting with access sites at the midline precisely at the point of desired chin augmentation, one for the labiomental crease and two lateral access sites for the lateral chin compartments. Fat is injected with 1-cc cannulas under constant motion with lower pressure until desired improvement is achieved, available in the "Related Videos" section of the full-text article on PRSJournals.com or, for Ovid users, available at <http://links.lww.com/PRS/C982>.

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The patient’s inner thighs are prepared and draped. To ensure cell viability, no infiltration of

epinephrine or local anesthetic is used. The fat is harvested from the patient’s inner thighs with manual low-pressure lipoaspiration by means of a 10-cc syringe using a blunt 3-mm cannula with multiple small holes. Once the syringe is filled halfway, it is removed and placed in a centrifuge



**Fig. 1.** Follow-up results for autologous chin augmentation. The patient underwent chin augmentation with autologous fat in conjunction with concomitant face and neck lift and upper and lower blepharoplasty and brow lift. Preoperatively (*left*) and 9 months postoperatively (*right*). Note improvement in labiomental crease and marionette lines.



**Fig. 2.** Follow-up results for autologous chin augmentation. The patient underwent chin augmentation with autologous fat in conjunction with concomitant face and neck lift and upper and lower blepharoplasty and brow lift. Preoperatively (*left*) and 9 months postoperatively (*right*). Note improved contour and chin projection postoperatively.

for 1 minute (2250 rpm) at low pressure to remove cellular debris.<sup>25</sup> After wasting the supernatant and infranatant, the isolated middle fat is placed in 1-cc syringes and injected immediately to minimize air exposure. If an adequate amount of fat cannot be obtained from the inner thighs, the abdomen is the secondary site for fat harvest, as both areas have demonstrated similar efficacy in facial fat grafting.<sup>26</sup>

A 16-gauge needle is used for four access sites: one midline precisely at the point of desired chin augmentation, one for the labiomental crease, and two lateral access sites for the lateral chin compartments.

1. Initially, the true midline of the chin is marked and direct fat augmentation above the periosteum is placed centrally (1 to 2 cc) with lateral blending deep to the lateral chin hollow (1 to 2 cc). This area is overcorrected by 50 percent in female patients and 100 percent in male patients because of long-term fat resorption.
2. A blunt tip Coleman cannula is used for correction of the lateral chin hollowing in the superficial fat compartment in this area (see Video, Supplemental Digital Content 1, <http://links.lww.com/PRS/C982>). The prepared fat is then injected by means of 1-cc syringes under low pressure with constant movement throughout the injection process. Two to 3 cc of fat is injected in multiple directions both longitudinally and radially to correct the lateral chin hollows bilaterally.
3. If a deep labiomental sulcus is present, a transverse injection targeting the labiomental sulcus is carried out to fill the depression. One to 2 cc of fat is injected without overcorrection.

Fat may be injected differentially to address chin asymmetries. Furthermore, injections can be carried out along the entirety of the lateral jaw line deep to the masseter to highlight the lateral mandibular border if deemed appropriate.

This technique has been used for over 3 years by the senior author (R.J.R.) in over 50 combined facial rejuvenation patients without overcorrection, fat clumping, nerve damage, or significant asymmetries. Minor asymmetries at the time of the procedure can be massaged and molded to achieve uniformity and symmetry. Injection is carried out with constant movement of the cannula in an effort to prevent any direct injection into any vascular structures. When performing chin

augmentation in female patients, it is important to err on the side of undercorrection, as overcorrection may lead to a broad and prominent chin, which can masculinize the face and lead to a suboptimal aesthetic result.

In the authors' experience with this chin augmentation technique with fat grafting, the patients have improved facial aesthetics and high satisfaction. At follow-up, the patients demonstrate maintenance of chin projection following fat augmentation (Figs. 1 and 2).

## CONCLUSIONS

The chin and surrounding regions play a significant role in aesthetics of the lower third of the face. Imbalance in this region leads to a disharmony between the facial thirds and detracts from overall facial aesthetics. Fat augmentation is a simple, effective, and safe method to address mild microgenia, chin asymmetries, contour irregularities, marionette lines, a bifid chin, and a deep labiomental crease. Our experience with this technique is associated with high patient satisfaction, minimal cost, and no complications once it has been learned. Furthermore, this technique obviates the need for an implant or hardware associated with sliding genioplasty along with the associated morbidities involved with these techniques. Therefore, fat augmentation can serve as a useful adjunct in creating balance in facial aesthetics, and enhancing outcomes in facial rejuvenation or rhinoplasty.

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## PATIENT CONSENT

*Patients provided written consent for the use of their images.*

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