

Case Report

# A Novel Approach for Correcting Mandibular Asymmetry With a Combination of Autologous Fat and Alloplastic Implants

Aesthetic Surgery Journal  
30(4) 513–515  
© 2010 The American Society for  
Aesthetic Plastic Surgery, Inc.  
Reprints and permission:  
[http://www.sagepub.com/  
journalsPermissions.nav](http://www.sagepub.com/journalsPermissions.nav)  
DOI: 10.1177/1090820X10380704  
[www.aestheticsurgeryjournal.com](http://www.aestheticsurgeryjournal.com)  


Derek Masden, MD; and Stephen Baker, MD, DDS

**Abstract**

Unilateral mandibular asymmetry has numerous etiologies. In the absence of current dentofacial deformities, this asymmetry, although not functionally debilitating, can still be troubling to the patient. There are several approaches to correcting this asymmetry, mainly focusing on the facial skeleton. However, with unilateral asymmetry, correction of the hard tissue alone often produces a suboptimal result. The overlying soft tissue becomes stretched, producing an angulated appearance dissimilar to the contralateral normal side. The authors present a case report of a patient with mandibular asymmetry who was treated with our novel technique of intentionally undercorrecting the skeletal asymmetry with alloplastic implants while augmenting the overlying soft tissue with autologous fat grafting.

**Keywords:**

fat grafting, mandibular asymmetry, alloplastic implant

Accepted for publication December 10, 2009.

Unilateral mandibular asymmetry has numerous etiologies: congenital, traumatic, iatrogenic, and postoncologic. In the patient who does not have an occlusal cant or is not a candidate for orthognathic surgery, alloplastic mandibular implants have been successfully placed to improve the presenting asymmetry. However, despite achieving skeletal symmetry, noticeable facial asymmetry may persist. This problem is a result of overlying hypoplastic soft tissue being acutely stretched to accommodate the enlarged dimensions of the implant. Although skeletal symmetry is present, the tighter soft tissue envelope frequently gives the face a hard, more angular appearance. Although typically a more angular appearance is desired, it is the resulting asymmetry to the normal side that compromises the ultimate result.

Recently, we have employed a technique of composite mandibular reconstruction that combines the placement of alloplastic implants with autogenous fat grafting to achieve improved mandibular symmetry in these patients. Utilizing this method, we intentionally undercorrect the skeletal asymmetry and ultimately achieve mandibular contour with grafted autogenous fat. The initial fat injection is performed at the insertion of the implant and subsequent fat injections are performed postoperatively until the desired contour is achieved. The combination of

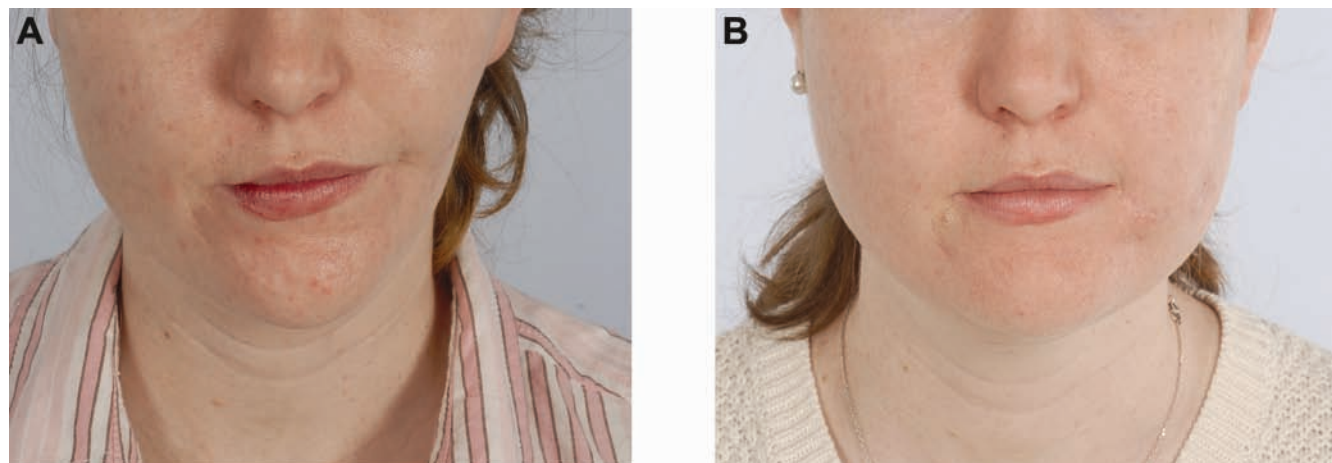
deliberately-undersized implants in conjunction with fat grafting provides the surgeon with a tool for achieving precise symmetry of the final contour of the face.

Prior to surgery, each of our patients undergoes a complete facial examination, during which dentofacial deformity is ruled out. Preoperative radiographs and a physical examination are completed to determine the size and type of implant to be utilized. A polyethylene (Medpore; Porex Surgical Products Group, Newnan, Georgia) implant is then ordered for each patient. The implant that is chosen to correct the bony deficiency is intentionally smaller than that necessary to achieve skeletal symmetry. Either a smaller-sized implant is ordered or a normal-sized implant is selected, with the plan of reducing its size intraoperatively. The implant is then contoured as necessary and affixed through screw fixation.

From the Department of Plastic Surgery, Georgetown University Hospital, Washington, DC.

**Corresponding Author:**

Dr. Stephen Baker, 1 PHC Building, Georgetown University Hospital, 3800 Reservoir Rd., Washington, DC 20007, USA.  
E-mail: [SBB6@gunet.georgetown.edu](mailto:SBB6@gunet.georgetown.edu)



**Figure 1.** (A) A 25-year-old woman with Goldenhar syndrome who presented for correction of her facial asymmetry. (B) Seventeen months after placement of a polyethylene implant that was modified for contour at the posterior left mandibular angle, followed by fat injections. The patient also underwent subsequent fat injections in the office at three and nine months postoperatively.

Autogenous fat is harvested using Coleman cannulae and 10-mL syringes. The fat is prepared utilizing the Coleman method, processed by gentle sweep over a Telfa sponge, and injected with 1-mL syringes and Coleman cannulae in the soft tissue overlying the implant.<sup>1</sup> The fat is injected in multiple planes overlying the implant and surrounding tissue until adequate soft tissue size and contour is achieved. Each patient then undergoes a series of subsequent fat injections as necessary, performed at least three months apart. These fat injections are performed in the office under local anesthesia. The initial volume of fat injected is variable among patients. The goal is to overcorrect the asymmetry, realizing that there will be some loss of adipocyte viability with time. Typically, between 5 mL and 20 mL is adequate for the initial injection. Subsequent injection volume is also variable and depends on the amount of adipocyte survival. Large volumes (30 mL or more) of fat can be easily harvested in the office, although typically only 5 mL to 10 mL is needed for intraoffice injections. Results are evaluated through pre- and postoperative photographs, to compare symmetry before and after the procedure.

## CASE PRESENTATION

A 25-year-old woman presented to our office with Goldenhar syndrome; she was seeking an improvement in her facial symmetry. Her deformity was considered a mild expression of hemifacial microsomia and an operative plan was constructed in which she would be treated with the composite technique described above. The patient had a polyethylene implant that had been modified for contour placed at the posterior left mandibular angle, followed by fat injections. She underwent subsequent fat injection in the office at three and nine months postoperatively.

After undergoing the combination of alloplastic implant and fat grafting, the patient achieved improved symmetry

and increased satisfaction with her appearance. The patient's results at 17 months can be seen in Figure 1; the improved size and contour on the left side of her face is easily appreciable postoperatively. The results, which are softer and more naturally contoured, can be contrasted with the hard, angular appearance of standard alloplast-only reconstruction. The contours of her reconstructed side closely match the normal side because fat grafts were injected to fine-tune and "feather" the ultimate result.

The patient experienced no associated major complications, either from the fat harvest site or the reconstructed site. She did note rupture of some of her intraoral stitches, for which she was started on an extended course of Peridex (3M ESPE Dental Products, St. Paul, Minnesota) and antibiotics. The complication resolved well and the patient had no further complications.

## DISCUSSION

Fat grafting has been recognized as an adjunct to reconstructive and aesthetic procedures for more than 100 years, since Neuber<sup>2</sup> first described it in 1893. In a national consensus survey, more than 50% of plastic surgeons perform some type of fat grafting and believe that there is clinically-evident graft survival and patient satisfaction.<sup>3</sup> Although controversy does exist, it is regarded as a safe and reproducible way of augmenting the soft tissue.<sup>4</sup> The preponderance of literature regarding fat grafting centers on the breast and facial rejuvenation, but there have been reports of its application in patients with congenital facial dimorphisms such as cleft lip, hemifacial atrophy, and hemifacial microsomia.<sup>5-7</sup>

The authors believe that autogenous fat—in conjunction with an implant that is slightly smaller than necessary to achieve skeletal symmetry—can produce a more natural result for the correction of mandibular asymmetry. This is particularly useful in patients with mild forms of hemifacial

microsoma. Fat grafting allows the surgeon the opportunity to sequentially fine-tune and finesse the final contours and volume of the soft tissue envelope, resulting in improved facial symmetry.

Certainly, the surgeon and patient must be cognizant of the need for further fat grafting for both volume replacement and contour irregularities. Adipocyte viability and survivability following harvest has been reported to be from 10% to 90% and the time interval for this resorption is variable,<sup>8-13</sup> resulting in the potential for temporary aesthetic results requiring further grafting to replace lost tissue. The patient presented in this report did require subsequent fat injections, up to one-and-a-half years post-operatively. As research improves with regard to the survivability of autogenous fat grafting, its application as a permanent filler will aid in this type of composite reconstruction for mandibular asymmetry.

## CONCLUSIONS

Composite reconstruction with alloplastic implants and autologous fat provides the surgeon with an additional tool to improve aesthetic outcomes for patients with mandibular asymmetry. Compared with the placement alloplasts alone, the addition of overlying autologous fat provides an adjunct that can produce a more symmetric and natural-appearing face. The patient should be informed that subsequent fat injections will likely be needed; however, this presents the surgeon with an opportunity to fine-tune any remaining asymmetries. Alloplastic implants and autologous fat have proven to be safe modalities for facial augmentation and this type of composite reconstruction offers another, more customizable option for patients and surgeons alike.

## Disclosures

The authors declared no conflicts of interests with respect to the authorship and/or publication of this article.

## Funding

The authors received no financial support for the research and/or authorship of this article.

## REFERENCES

1. Coleman SR. Facial recontouring with liposuction. *Clin Plast Surg* 1997;24:347-367.
2. Neuber GA. Fetttransplantation. *Verg Dtsch Ges Chir* 1893;22:66.
3. Kaufman MR, Bradey JP, Dickinson B, et al. Autologous fat transfer national consensus survey: trends in techniques for harvest, preparation, and application, and perception of short and long term results. *Plast Reconstr Surg* 2007;119:323-331.
4. Coleman SR, Saboeiro AP. Fat grafting to the breast revisited: safety and efficacy. *Plast Reconstr Surg* 2007;119:775-785.
5. Duskova M, Kristen M. Augmentation by autologous adipose tissue in cleft lip and nose: final esthetic touches in clefts: part I. *J Craniofac Surg* 2004;15:478-481.
6. Chajchir A, Benzaquen I. Fat-grafting injection for soft-tissue augmentation. *Plast Reconstr Surg* 1989;84:921-926.
7. Moscona R, Ullman Y, Har-Shai Y, et al. Free-fat injections for the correction of hemifacial atrophy. *Plast Reconstr Surg* 1989;84:501-507.
8. Peer LA. Loss of weight and volume in human fat grafts with postulation of "cell survival theory". *Plast Reconstr Surg* 1950;5:217-230.
9. Nguyen A, Pasyk KA, Bouvier TN, Hassett CA, Argenta LC. Comparative study of survival of autologous adipose tissue taken and transplanted by different techniques. *Plast Reconstr Surg* 1990;85:378-386.
10. Niechajev I, Sevcuk O. Long-term results of fat transplantation: clinical and histologic studies. *Plast Reconstr Surg* 1994;94:496-506.
11. Har-Shai Y, Lindenbaum ES, Gamliel-Lazarovich AM, et al. An integrated approach for increasing the survival of autologous fat grafts in the treatment of contour defects. *Plast Reconstr Surg* 1999;104:945-954.
12. Smith P, Adams WP Jr, Lipschitz AH, et al. Autologous human fat grafting: effect of harvesting and preparation techniques on adipocyte graft survival. *Plast Reconstr Surg* 2006;117:1836-1844.
13. Piasecki JH, Gutowski KA, Lahvis GP, et al. An experimental model for improving fat graft viability and purity. *Plast Reconstr Surg* 2007;119:1571-1583.