



# Postreduction Breast Augmentation

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**Background:** Most breast reduction patients are highly satisfied after surgery. However, there is a subset of women who seek breast augmentation years later to restore lost volume chiefly associated with weight loss and postpartum changes. Breast shape and overall aesthetics are often revised at the same time.

**Methods:** A retrospective review was performed of 2 surgeons' experiences with post-reduction breast augmentation. Twenty patients were identified between 2002 and 2014. An in-depth chart review was conducted to determine patient motivation and to examine the operative techniques employed. Implant variables, a reduction specimen weight to implant volume comparison (where available), and complications are reported.

**Results:** The average age was 37.1 years and average body mass index was 21.8 kg/m<sup>2</sup>. Most patients waited over a decade to have their breasts revised. Weight loss was the motivating factor in 8 patients and pregnancy changes in 11. Nineteen patients wished to stay with the same bra size or 1 cup size larger. Although all patients elected to have an implant placed, 19 patients wished to have an improved breast shape, not specifically a larger volume. The average breast implant was 203.5 cm<sup>3</sup> (range, 120–340 cm<sup>3</sup>). Complications from implant placement included a seroma treated by aspiration and a Baker class III capsular contracture that required surgical correction.

**Conclusions:** A small subset of reduction mammoplasty patients seek breast augmentation many years later primarily to improve breast contour, not to restore their prerelation breast volumes. Conservative augmentation combined with revision of breast shape and areolar aesthetics yields good results with minimal complications. (*Plast Reconstr Surg Glob Open* 2015;3:e527; doi: 10.1097/GOX.0000000000000479; Published online 1 October 2015.)

**R**eduction mammoplasty has been shown to decrease back and shoulder pain, improve breast aesthetics, enhance self-esteem, and improve both self-confidence and overall happiness.<sup>1,2</sup> Breast reduction has one of the highest patient satisfaction rates among plastic surgery procedures. About

93% of women reported in a study<sup>3</sup> that they would undergo the surgery again. As the benefits of breast reduction have become established, and with the rise of adolescent obesity, many patients undergo reduction mammoplasty at a young age. This population is most susceptible to changes in breast morphology due to subsequent life events.<sup>4</sup> Aging, pregnancy, breastfeeding, and weight loss can all negatively impact the results of a previously successful breast reduction. About 14% of patients in another study<sup>5</sup> who become pregnant after breast reduction were less satisfied with their breast shape due to increased ptosis.

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Findings in patients considering postreduction breast augmentation typically include a loss of upper pole fullness and stretching of the skin envelope. Pseudoptosis is common and there is often an associated alteration in areolar shape, nipple position, or both. Scar quality is another frequent concern. The purpose of this study is to characterize the profile of patients seeking postreduction breast augmentation, analyze operative strategy and techniques used, examine implant selection variables, and report outcomes and complications.

## METHODS

A retrospective review of the authors' medical charts of patients undergoing postreduction breast augmentation was undertaken from 2002 (the oldest case found) to 2014. There were no specific exclusion criteria for acceptance to the study. An in-depth chart review was conducted to determine circumstances leading to consultation such as weight loss, pregnancy, breast-feeding, and aging; demographics; medical and surgical history; operative techniques used; analysis of implant variables; complications; and outcome. Patients who constituted the study group were those who could not be successfully treated by a secondary mastopexy alone.

Patients treated during this study period were not offered fat grafting of the upper pole as an alternative to breast implants. Although the volumes typically needed are within the range of what has proven feasible already, the efficacy of fat grafting alone for this application has yet to be demonstrated.

### Operative Technique

This patient population is considerably different from the primary augmentation candidates in terms of implant selection. Limiting tissue characteristics and anatomy are not important factors in postreduction patients, particularly because only small implant sizes are needed. Therefore, trying on small sizes in the patient's existing bra was effective for estimating the implant volume needed to provide adequate upper pole fill. Most patients refused using a larger bra for sizing purposes, consistent with the commonly observed goal of improving aesthetics with minimal volume increase. All patients except for 1 (16 total) treated after the implant moratorium concluded in 2006 chose a silicone implant.

Original operative reports were rarely available and therefore the type of pedicle and resection volumes were largely unknown. Therefore, operative

strategy included using the lateral aspect of the inframammary incision for access (central inframammary incision for the sole vertical reduction patient) and developing a subpectoral pocket to minimize nipple areola complex vascularity concerns. Lateral pocket dissection was minimized given the relatively small implant sizes used. All implants used were smooth, round, and had intermediate height projection (Mentor Moderate-Plus style; Mentor Worldwide LLC, Santa Barbara, Calif.). Implants were inserted using skin isolation with adhesive plastic sheeting, antibiotic pocket irrigation, and standard minimal-touch technique.

After closure of the implant pocket, the operating table was flexed to 90 degrees. The preoperative markings made to improve breast contour were then adjusted as necessary. Bottoming out and excessive lateral fullness were the most common shape problems. A horizontally designed elliptical skin excision pattern (including the inframammary scar within) was most commonly used to reset lower pole length at 5–6 cm measured from the inferior areolar margin to the inframammary crease. It also provided access for selective tissue excision to improve contour, typically excising more laterally than medially (Fig. 1). Sometimes, a fleur-de-lis pattern that included a slender triangle-shaped vertical excision (limbs diverging inferiorly) proved necessary also to narrow the breast. Areolar refinement was often performed concomitantly, particularly because irregular shapes are magnified with augmentation (Fig. 2). Selective excision of either normal breast or areolar skin along portions of the circumference was performed to restore a round areolar shape. It was rarely necessary to circumscribe the areola entirely unless an obvious discrepancy between areolar diameters existed.

## RESULTS

Twenty patients with a mean age of 37.1 years (range, 22–50 years) underwent a breast reduction and then subsequently a breast augmentation procedure, the latter between September 2002 and November 2014. Nineteen of those patients underwent an inverted-T and 1 a vertical reduction originally. Only 1 patient had the breast reduction performed by one of the authors. Sixteen of the 20 postreduction patients underwent a primary postreduction augmentation and the other 4 a secondary (revisionary) augmentation. The interval between the reduction and primary augmentation performed by the authors ranged from 2 to 24 years with an average of 14.5 years (Table 1). The average body mass index (BMI) of the patients was 21.8 kg/m<sup>2</sup> (range, 18–27 kg/m<sup>2</sup>). The original re-



**Fig. 1.** A 42-year-old woman with a BMI of 22 is shown before (A, B) and after (C, D) placement of 150-cm<sup>3</sup> implants 18 years after her initial inverted-T reduction. Both an areolar and lower pole shape revision were performed at the same time.

section volume was known in only 1 case (526-g right breast and 370-g left breast).

All patients stated at their initial consultation that they were unhappy with their breasts, primarily noting a deflated appearance. Eight patients stated that their breasts changed significantly due to a weight loss

of more than 10 lbs. Eleven patients stated that they were satisfied until their breasts changed due to pregnancy and breast-feeding. Many patients cited that a combination of life events changed the shape of their breasts. Four of the 20 patients explained that they wished to improve both shape and symmetry.



**Fig. 2.** A 41-year-old woman with a BMI of 21 is shown before (A, B) and after (C, D) placement of 340-cm<sup>3</sup> implants (the largest in the series) 15 years after her initial inverted-T reduction. An areolar shape revision on the right side was performed at the same time.

Most patients wanted to be fuller superiorly and either remain at the same cup size or increase by not more than 1 cup size. Only 1 patient wanted to be a D cup, in her case 2 cup sizes larger. Most patients did not complain specifically about shape problems, but all accepted proposals to improve shape or areolar aesthetics when the possibilities were pointed out.

Almost all who underwent an inverted-T reduction requested revision of the inframammary scar primarily to improve scar quality.

Sixteen patients (80%) who underwent an inverted-T reduction required skin excision along the inframammary incision to correct pseudoptosis. Six of these required a fleur-de-lis excision pattern to treat

**Table 1. Patient Characteristics, Implant Selection, and Outcomes**

Patient	BMI	Age	Years since Reduction	Postpartum Changes	Weight Loss	Implant Size and Type	Bra Cup Size Change	Complications
1	20	39	20	Yes	No	215-cm <sup>3</sup> silicone	—	None
2	19	22	—	No	Yes	235-cm <sup>3</sup> silicone	—	None
3	22	42	18	Yes	No	150-cm <sup>3</sup> silicone	None	None
4	20	31	13	Yes	No	175-cm <sup>3</sup> silicone	Up 1	None
5	25	42	24	Yes	Yes	215-cm <sup>3</sup> silicone	Up 1	None
6	—	30	10	—	—	225-cm <sup>3</sup> silicone	—	None
7	22	30	2	No	No	225-cm <sup>3</sup> silicone	Up 2	None
8	18	37	20	Yes	No	200-cm <sup>3</sup> silicone	Up 1	None
9	20	46	20	Yes	No	225-cm <sup>3</sup> silicone	Up 1	None
10	20	40	13	Yes	Yes	320-cm <sup>3</sup> saline	Up 2	None
11	21	44	12	Yes	Yes	150-cm <sup>3</sup> silicone	None	None
12	20	30	—	No	Yes	275-cm <sup>3</sup> silicone	—	None
13	21	43	23	Yes	No	170-cm <sup>3</sup> silicone	Up 1	Seroma
14	20	50	11	—	—	150-cm <sup>3</sup> saline	—	None
15	—	49	—	—	—	265-cm <sup>3</sup> saline	—	None
16	22	41	18	Yes	Yes	340-cm <sup>3</sup> silicone	Up 1	None
17	18	39	14	Yes	No	250-cm <sup>3</sup> silicone	Up 1	None
18	27	36	9	No	Yes	250-cm <sup>3</sup> saline	—	Capsule
19	20	35	8	No	Yes	120-cm <sup>3</sup> silicone	None	None
20	19	23	7	No	No	215-cm <sup>3</sup> silicone	—	Non

more severe ptosis. Ten patients underwent areolar revision to improve the shape and 2 patients requested lateral chest wall liposuction. All of the secondary augmentation patients required a capsulorrhaphy to reduce either the inferior or lateral extent of the pocket, or both.

Patient preference determined the implant filler type. Silicone implants were used in 16 patients and saline implants were used in 4 patients. Three of the latter were placed during the silicone implant moratorium (1992 and 2006). The average implant size was 203.5 cm<sup>3</sup> (range, 120–340 cm<sup>3</sup>). All cases were bilateral with the exception of 1 patient who had a 150-cm<sup>3</sup> implant placed unilaterally to improve symmetry. The weights of the original reduction were known for only 1 patient as only 1 patient had both a reduction and augmentation performed by the authors. The total weight of breast tissue removed in this patient was 896 g (526-g right breast and 370-g left breast). This patient had 235-cm<sup>3</sup> implants placed; this case supports the impression that patients were not interested in restoring the original breast volume.

There were 2 complications resulting from surgery. One patient developed a seroma, which was treated with nonoperative drainage, and 1 patient developed an unilateral Baker class III capsular contracture, which required surgical revision. One patient subsequently downsized her implants from 225 cm<sup>3</sup> to 175 cm<sup>3</sup>. All patients remarked that they were satisfied after the surgery.

## DISCUSSION

It has been suggested that the need for breast implants following breast reduction results from not

“getting the size right” during the initial procedure.<sup>6</sup> Postulated reasons include miscommunication between the patient and the surgeon, specimen weight requirements for insurance companies, and the unpredictability of future changes due to weight loss and pregnancy. Other studies<sup>7,8</sup> have shown that revisions following breast reduction were due to overresection in as many as 40%, contributing to reoperation rates as high as 9%. Contrary to these conclusions, most of the patients in this study sought breast augmentation primarily to address breast shape deterioration and not to enhance size per se. They generally sought upper pole volume restoration using the smallest possible implant size, with only 1 exception. Moreover, the relatively long average time interval between the 2 procedures shown in this study argues against early dissatisfaction with initial outcome.

Almost all of the patients in this study underwent inverted-T breast reductions. Inverted-T methods are prone to bottoming out, which has the secondary effect of reducing upper pole volume.<sup>9</sup> The breast base is not narrowed with this technique so that volume is distributed more horizontally, also contributing to depressed upper pole contour. Finally, inverted-T methods remove a lot of skin, which predisposes to overresection in the pursuit of final volume/envelope congruity.

Vertical reductions may not have the same propensity for late deformity requiring implants for several reasons. First, most designs are superior pedicle-based, which tends to preserve upper pole volume. Second, vertical reduction narrows the breast and “verticalizes” volume distribution compared to inverted-T methods.<sup>10,11</sup> Finally, vertical reduction

entails less skin resection, which tends to discourage overresection. On the other hand, given the long average time until presentation for secondary surgery with implants in this study, it could be that vertical reductions have not been popular for long enough or widely practiced enough to generate a significant number of candidates for implant placement.

It has proven safe in this study to insert breast implants through the lateral inframammary scar and place them in a subpectoral plane, even though the reduction pedicle type is usually unknown. This approach does not disturb the vascularity to either an inferior or superior pedicle design should limited circumareolar glandular dissection prove necessary as part of the revision procedure. A new short central inframammary incision is preferred in vertical reduction patients to insert the implant rather than using a periareolar transglandular approach, because the latter can predispose to periareolar and lower pole scar contraction deformities when tissues are thin and atrophic.

The same factors that predispose to upper pole hollowing with inverted-T methods also contribute to shape abnormalities requiring concomitant skin and tissue excision to correct pseudoptosis and residual lateral fullness. Furthermore, lower pole lengthening as much as 3 cm is associated with breast-feeding with both inverted-T and vertical reduction methods.<sup>12,13</sup>

Areolar shape abnormalities are common following breast reduction, either due to parenchymal deflation over time, a lack of attention to detail during the original procedure, or other reasons.<sup>14</sup> This is easy to remedy following implant placement and breast shape revision by selective skin excision as described. This relatively minor and simple adjunctive procedure can improve overall aesthetics considerably.

This study supports the notion that weight loss is an important factor affecting postreduction breast aesthetics with 40% of patients reporting significant weight loss following breast reduction. It is a reasonable practice to request weight loss before reduction surgery, particularly when a high BMI may jeopardize procedure safety. However, as a practical matter, the higher the BMI and the larger the breasts, the more difficult it is for patients to exercise and achieve meaningful weight loss before surgery. On the other hand, the procedure itself serves as a stimulus for postoperative weight loss in motivated women.<sup>15-18</sup> It is therefore difficult to predict weight changes either in advance of surgery or after to minimize the need for secondary surgery requiring implants later. Similarly, postoperative changes associated with pregnancy and aging also cannot be anticipated with accuracy. Fortunately, secondary

procedures described in this report can effectively address all of these issues.

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