

Lipoaugmentation following Implant Removal Preferred by Plastic Surgeons and the General Public

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Background: Breast implant removal followed by fat transfer to the breast (lipoaugmentation) is a newer procedure and as such there is a need for empirical aesthetic comparisons between breast augmentation with implants versus fat transfer. Fat transfer to the breast is becoming an important option for women seeking reoperation of breast augmentation.

Methods: A survey was created using standardized before and after photographs of 12 patients who underwent implant removal and lipoaugmentation. Four photographs of breasts that had no surgery were used as controls, with identical before/after photographs. The survey was administered to 96 respondents from the general population and 10 plastic surgeons. Respondents were asked to rate the breasts using a 5-point Likert scale without procedural knowledge. The responses were evaluated using parametric statistical *t* tests to compare responses to implants versus fat transfer in terms of their respective attractiveness, naturalness, size, symmetry, and femininity.

Results: Fat transfer was significantly preferred to implants on all 5 measures; attractiveness, naturalness, size, symmetry, and femininity. Fat transfer was significantly preferred to implants by a margin of +0.36 average on 1–5 scale, which is approximately 1/3 of a Likert interval on all measures. Plastic surgeons took significantly longer than the general population to complete the survey and preferred fat transfer over implants to a higher degree.

Conclusions: Lipoaugmentation can provide a favorable aesthetic outcome in women seeking implant removal. The general public can be conveniently surveyed via crowd sourcing, and their aesthetic judgments largely mirror those of trained and experienced plastic surgeons. Patients weighing breast implant removal or breast implant revision could consider this study in their decision making. (*Plast Reconstr Surg Glob Open* 2018;6:e1882; doi: 10.1097/GOX.0000000000001882; Published online 7 August 2018.)

INTRODUCTION

Breast implant removal followed by fat transfer to the breast is a newer procedure and as such there is a need for empirical aesthetic evaluations of the outcomes. Although breast augmentation is the second most common cosmetic surgical procedure in the United States with 310,444 procedures performed in 2016,¹ breast implant removal

also ranks highly as the 10th most popular procedure with 43,181 performed. What are women doing after breast implant removal? Reoperation on breast implants has been reported at 15.5% within 5 years of primary breast augmentation (BA) surgery and 21.9% within 4 years of revision BA.² These high reoperation rates in a relatively short time span contribute to breast augmentation being the #2 procedure. Capsular contracture, implant malposition, implant rupture, pain, asymmetry, size change, and unsatisfactory result among other things all lead to implant revision. The relatively new procedure of transferring fat to the breast is becoming an important option for women seeking reoperation of BA. The raw material for it is the byproduct of the #1 most common procedure in the United States, liposuction (414,335, 89.1% female). The average body mass index of women globally is 24.4 and

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greater in high-income-English-speaking countries.³ The byproduct of liposuction, fat, can be easily collected and prepared for transfer instead of discarded. Fat transfer to the breast rose to the 15th most common procedure in the United States, with 25,585 fat transfers in 2016, a 41% increase over 2015. Social media coverage of breast implant illness and the development of breast implant associated anaplastic large cell lymphoma may convert more patients with implants to fat in the future.⁴ The number of breast augmentations per year does not distinguish primary augmentation versus revision augmentation. Women need more information about fat transfer to the breast, including a comparison of how fat transfer looks versus the implants they had before reoperation, and including the opinions of the general population and their plastic surgeons.

Crowdsourcing evaluations via the internet is a newer research methodology that is affordable⁵ and more efficient than obtaining surveys from plastic surgeons, which requires repeated efforts and weeks to months. An international survey on breast augmentation required 4 e-mail campaigns over 12 weeks with only a 12.3% response rate.⁶ Breast appearance has been queried in the Breast-Q, a validated, patient survey, measuring attractiveness, naturalness, size, symmetry, and sexuality among many other measures.⁷ This study aimed to assess the appearance of fat transfer to breasts compared with prior implants across 5 qualities: attractiveness, naturalness, size, symmetry, and femininity. The study also included and compared the responses of the general population and experienced, trained plastic surgeons.

METHODS

A survey was created using standardized before and after photographs of 12 consecutive patients who underwent implant removal followed by lipoaugmentation and provided photographic authorization for use in research and publication. The photographs were taken with standardized camera settings, lighting, body position, and distance from patient to camera. The after photographs were taken approximately 6 months after removal of implant and fat transfer. Four photographs of breasts that had no surgery were used as controls/distractors, with identical before/after photographs. Two of these 4 controls were preoperative patients for breast augmentation, and 2 were preoperative patients for breast reduction, representing a wide spectrum of size and shape as seen in the experimental group and in the general population of women. The 16 sets of photographs were placed side by side. They were labeled left and right to keep the respondents naive to preoperative and postoperative labeling. The survey was administered to 96 respondents from the general population and 10 plastic surgeons from the author's professional network.

Respondents were asked to rate their preferences in relation to the breasts in the photograph on the right side versus the breasts on the left side of a pair of photographs using a 5-point Likert scale; 1, strongly disagree; 2, mildly

disagree; 3, no difference; 4, mildly agree; and 5, strongly agree (across a feature list ranging from attractiveness to size). The comparison was always right to left and the order of the Likert scale was the same for consistency of question direction. Half of the postoperative photographs were placed on the right and vice versa to eliminate left/right bias. The survey was designed in Survey Monkey and administered via Mechanical Turk, an Amazon on-demand, marketplace for human intelligence tasks. The survey came with a warning for nudity. The general population survey takers were adults and rated as Mechanical Turk Masters who are certified by Amazon as having consistent, high-quality results and high Requestor approval ratings.

After pilot testing surveys with 10 participants (not included in the results), the original survey was shortened by removing 2 control photo sets and decreasing the questions per photoset from 8 to 5. The author wanted to ensure that all the survey questions and corresponding photoset would appear in the same computer screen to avoid scrolling and confusion. This led to an average survey length of the final version being 5 minutes among the professional survey takers for which they were paid \$2.00, a standard amount for this time and type of survey. Amazon Mechanical Turk charges a premium for the certified Mechanical Turk Masters and the set up allows the researcher to choose how many responses and within what timeframe. The general population survey collection period was 72 hours with 96 out of a goal of 100 surveys were completed.

The plastic surgeons took significantly longer to answer the survey, 3 weeks with e-mail requests, text reminders, and only 1 of 3 plastic surgeons originally contacted completing the survey (for a total of ten plastic surgeons completing it). The responses were evaluated using parametric statistical *t* tests (2 tailed, single sample) to analyze comparisons between implants and fat for attractiveness, naturalness, size, symmetry, and femininity. The 5 specific qualities were evaluated in terms of the percentage that preferred fat, that is, scores 4 or 5, versus the percentage that preferred implants, that is, scores 1 or 2, versus no preference, that is, score 3. The plastic surgeons were compared with the general population on these measures. The surgical before and after photographs were compared with the controls as well. The survey provided space for optional qualitative comments to be made for each photoset, and demographic questions were also asked about respondents to assess outliers.

RESULTS

On all 5 measures, attractiveness, naturalness, size, symmetry, and femininity, fat transfer was significantly preferred to implants for the combined population of plastic surgeons and general population. Fat was significantly preferred to implants by a margin of +0.36 average on 1–5 scale, which is approximately 1/3 of a Likert interval on all measures (Fig. 1). The combined population (surgeons plus Turkers) ranked the breasts exchanged from implants to fat more Attractive +.409, Natural +.403, Femi-

nine +.344, Larger +.333, and Symmetric +.318. When the preferences of the plastic surgeons were analyzed separately, their preferences were as follows: Natural +.600, Attractive +.558, Symmetric +.542, Feminine +.450, and Larger +.300 (Fig. 2). In other words, the plastic surgeons found the breasts with Fat Transfer to be significantly more Symmetric, Natural, Attractive, and Feminine than did the general population (again, a finding shown to be significant using 2 tailed, 2 sample *t* test). Interestingly, there was no significant difference in their assessment on largeness. The general population's order of preference for fat over implants differed from that of the plastic surgeons, being Attractive +.393, Natural +.383, Larger +.337, Feminine +.332, and Symmetric +.294. So, the general population was less aware of the asymmetries in the implant photographs than the plastic surgeons. Four of the

patients had obvious asymmetries preoperatively either from rupture or capsular contracture. In 75% (9/12) of the implant to fat photos sets, the fat was collectively preferred to implants. A collective preference for implants over fat occurred in only 25% (3/12) of the implant to fat photos sets. However, the patients in these photo sets emphatically preferred their fat over their implants. One patient had malposition of her implant causing shoulder pain (Fig. 3), 1 had symmastia causing pain (Fig. 4), and the third had a unilateral, implant rupture.

If all the raters' responses are reduced to whether they Prefer Implants, No Preference, or Prefer Fat transfer, 27.4% prefer implants, 10.1% have no preference, and 62.6% prefer the fat transfer (Fig. 5).

Plastic surgeons preferred the fat transfer relative to the general population (74.3% versus 69.1%) although

Fat Preferred over Implant by +0.36 overall (1/3 Likert Interval)

$p < .0001$ in all cases

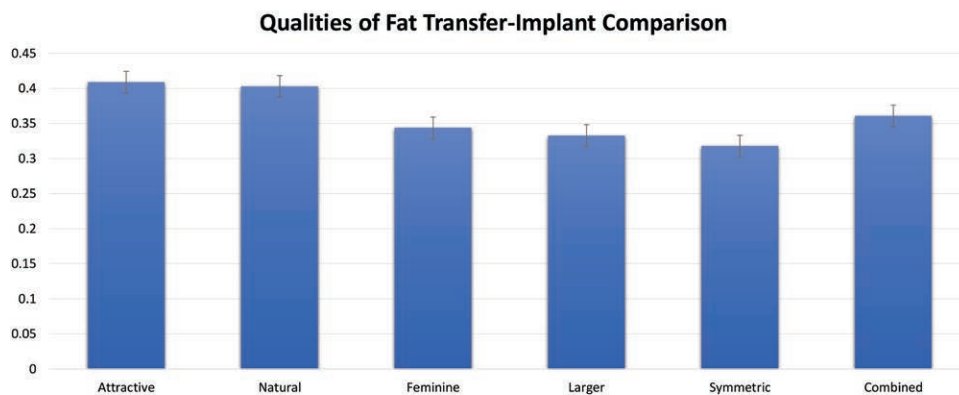


Fig. 1. Fat was significantly preferred by all survey respondents over implants by 1/3 of a Likert interval ($P < 0.0001$).

Fat Preferred over Implant by +0.36 (1/3 Likert Interval)

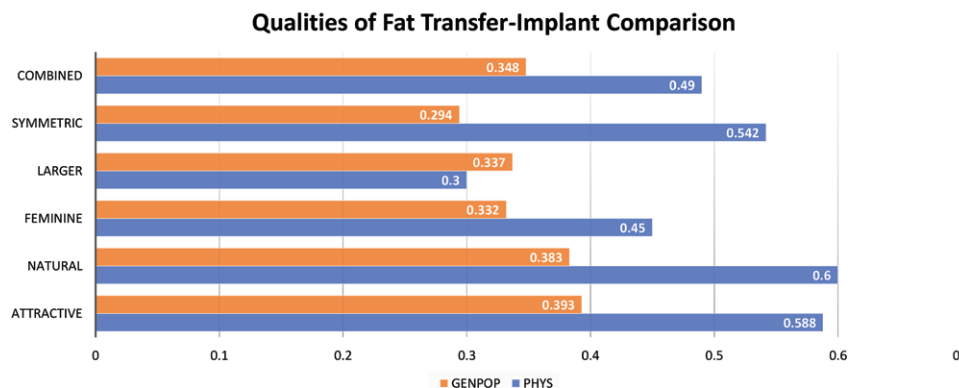


Fig. 2. Plastic surgeons preferred fat over implants significantly more than the general population in terms of symmetry, femininity, naturalness, and attractiveness.

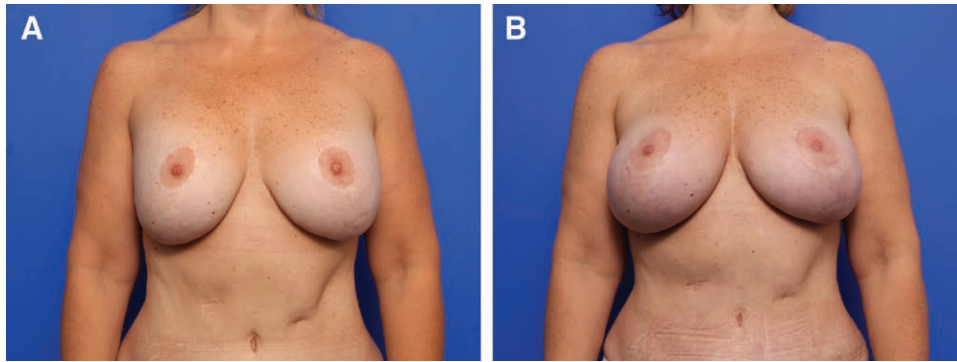


Fig. 3. Patient had right breast implant contracture and malposition near shoulder, causing shoulder pain (A). After implant removal and fat transfer to breast (B), the patient was pain-free and larger size than before.

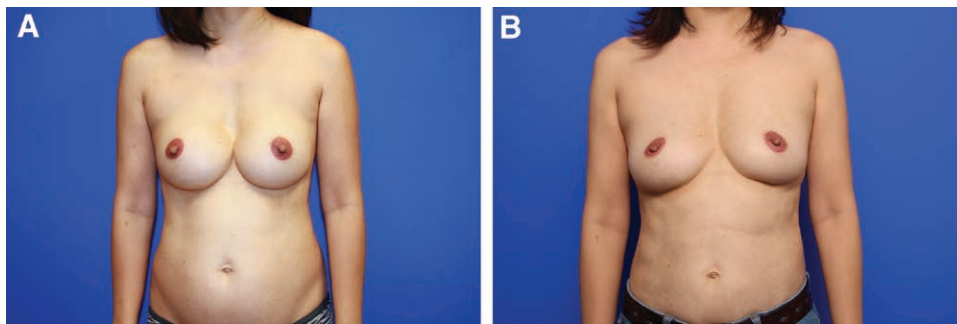


Fig. 4. Case where survey respondents preferred implant. The patient had painful symmastia and skin thin enough to show the implant tab (A). After implant removal and fat transfer, the pain, symmastia, and ptosis resolved (B).

this increase was not significant. When a rater has a preference for 1 image over another (89.9% of the time): 30.4% prefer implants and 69.6% prefer fat transfer (Fig. 6). Physicians are slightly more likely to have an opinion (preference for either) relative to the general population (90.8% versus 88.0%).

DISCUSSION

Mechanical Turk allows for data collection within hours to days of submitting a request. The fee paid \$2.00 for an average of 5 minutes of work or a projected

\$24.00/hour and the premium for Mechanical Turk likely facilitates quick and efficient data collection. The pilot was important in calculating appropriate survey length and reward. Requestors may set their rate as low as \$0.10 per survey. The speed of the Mechanical Turk Masters in filling out the surveys, however, did not impact the fact that their preferences mirrored those of trained plastic surgeons, although the plastic surgeons took much longer to complete the survey. Qualitative analysis of optional comments made by the Turkers, along with an analysis of drift (none evident) and consistency (present) also suggest they efficiently and appropriately filled out the surveys.

Preference for Implants over Fat Transfer: All respondents

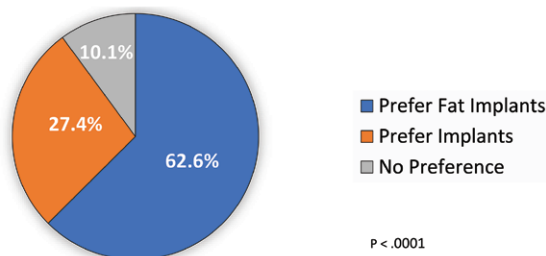


Fig. 5. When all the raters' responses are reduced to whether they Prefer Implants, No Preference, or Prefer Fat transfer, 27.4% prefer implants, 10.1% have no preference, and 62.6% prefer the fat transfer.

Fat/Implant Preferences for those Respondents who expressed a Preference (89.9%)

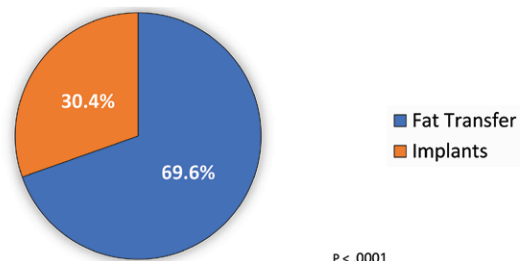


Fig. 6. When the respondents had a preference of implant vs. fat, the majority preferred fat ($P < 0.0001$).

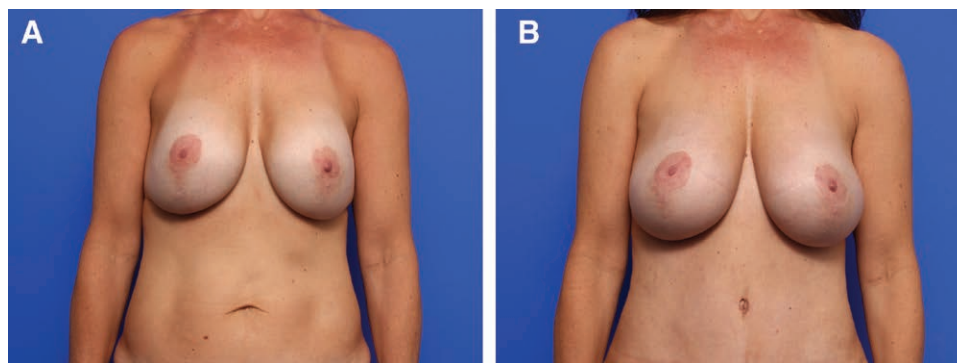


Fig. 7. Patient with “pseudoptosis” as described by the plastic surgeon survey respondent (A) and described as “more rounded and less flat on the lower or underside” by the general population after implant removal and lipoaugmentation (B).

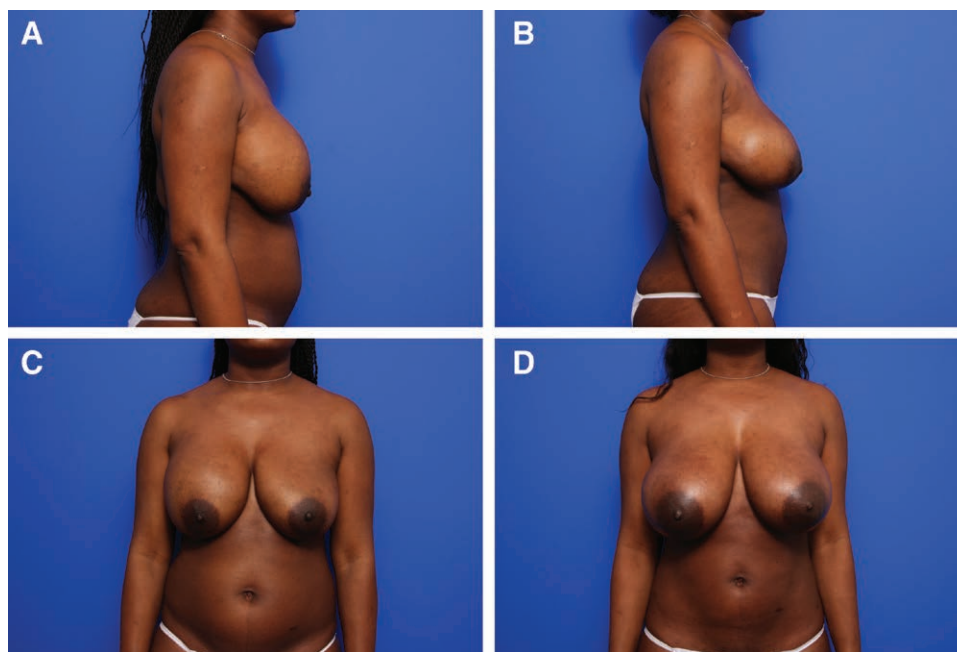


Fig. 8. The lateral view shows pseudoptosis or waterfall effect with breast apex well above a downward pointing nipple and deflation of the lower pole below the implant (A). After implant removal and fat transfer, the lower pole is rounded and the nipple is more forward pointing, nearly at the apex (B). The anterior view (C Before and D After implant removal and lipoaugmentation) does not illustrate the improvement as well.

The plastic surgeons evidenced a stronger preference for fat transfer. They also made more technical optional comments, such as “Right breasts look much more natural with less pseudoptosis or bottoming out appearance”. A Turker made the following comment on the same photo-set “The breasts on the right side seem to be more ‘rounded’ or less flat on the lower or underside and perhaps a bit smaller or just pulled up more making them appear less saggy” (Fig. 7). These results are reassuring for physicians utilizing general populations for online surveys in plastic surgery. Furthermore, the opinions of the general population or laypeople; patients, their partners, and friends; are the opinions that count for women who augment their breasts.

Fat transfer was preferred over implants for all 5 qualities; attractiveness, naturalness, size, symmetry, and femi-

ninity. However, the size comparison showed the smallest difference, that is, both the general population and plastic surgeons were more likely to report no size differential (and to vary more in answers). This is a helpful result, given that fat transfer was not considered automatically smaller by respondents. Before this study, the author has set patient expectations for a smaller breast with less projection and upper pole fullness. The author replaces implant volume with an equal or larger fat volume anticipating a volume reduction due to edema and variable fat retention that stabilizes at 4–6 months. The results of this study should not be extrapolated to patients who may be ideal candidates for primary breast augmentation with implants because half of the photosets had nonideal outcomes, that is, unilateral rupture of saline implant (4/12) and obvious capsular contracture (2/12). Interestingly, when these patients were

excluded from the comparison, fat was still significantly preferred over implants. The reasons for implant removal in aesthetically pleasing result would be better explored in a patient-based survey. Also, the photosets were anterior view only derived from a single surgeon rather than a general pool of surgeons performing the procedure. Video or inclusion of oblique and lateral views might affect results and future studies might want to consider this option, but in the current research, length of the survey and simplicity for respondents were paramount (Fig. 8). Of note, the author did not perform the initial implant augmentations on the patients. Future studies might compare the age of the breast implant and BMI of the patient, the volume of the implant and fat transferred, the time from the augmentation, and the effect of mastopexy and ptosis to the preference of implant to fat transfer. Results from studies such as the current one might also include patients' own ratings of their breasts before and after implant removal and fat transfer to the breasts.

CONCLUSIONS

Lipoaugmentation provides a favorable aesthetic outcome for patients who have decided to remove their implants as judged by both plastic surgeons and the general population. The general public can be conveniently surveyed via crowd sourcing, and their aesthetic judgments largely mirror those of trained plastic surgeons. The results of this study cannot be extrapolated to primary

augmentation with implants versus fat. Patients weighing breast implant removal versus breast augmentation revision could consider this study in their decision making.

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