

# Quality of Life After Breast Enlargement With Implants Versus Augmentation Mastopexy: A Comparative Study

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## Abstract

**Background:** Research regarding quality of life (QoL) among women who have undergone breast aesthetic surgery is expanding. A comparative, anonymous study between the two main breast aesthetic procedures is needed.

**Objectives:** The authors compared patient characteristics and aspects of QoL among women who underwent breast enlargement with implants (BI group) and those who underwent augmentation mastopexy (AM group).

**Methods:** Patients at the Oslo Plastic Surgery Clinic were given a 47-question survey to measure QoL. The survey was anonymous; 61 patients who received breast implants and 37 patients who underwent augmentation mastopexy between 2005 and 2009 responded. Answers were processed by a QuestBack return mail system and sent to the authors. Statistical analyses were performed to evaluate significance between the groups.

**Results:** The response rate was 67% in the BI group and 88% in the AM group. Mean follow-up time was 2.8 years in both groups. Motivation for surgery was primarily cosmetic (65%) and emotional (48%) in the BI group as well as cosmetic (78%) and physical (31%) in the AM group. The effects on psychosocial aspects were significant in the BI group regarding life changes and feeling like a “whole” person (68.9% vs 40.5% and 73.8% vs 40%). BI group also had a significantly higher satisfaction with overall cosmetic result, enlargement, and breast volume (93.4%, 90.2%, 80% vs 69.4%, 70.2% vs 67% in AM group). Additionally, the BI group was more satisfied with shape, scar, and symmetry (90.1% vs 63.9%, 70.6% vs 40.5%, and 83.6% vs 54.0%, respectively).

**Conclusions:** None of our patient groups were stereotypical and motivation for surgery was primarily cosmetic in both groups. BI patients were significantly more satisfied with the aesthetic outcome and the QoL of many psychosocial aspects. AM patients may have had different expectations than BI patients and a significant dissatisfaction was reported in shape, scarring, symmetry, and the nipple-areola complex.

## Level of Evidence: 3



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Research regarding the quality of life (QoL) among women who undergo aesthetic breast augmentation is expanding<sup>1-18</sup>; however, only a few studies have been published with data concerning postoperative QoL in augmentation mastopexy.<sup>11,19,20</sup> In 2004, Spear et al<sup>11</sup> discussed the more complex nature of both the patient's problems and the surgical procedure itself in augmentation mastopexy. The Spear et al<sup>11</sup> and Swanson<sup>14,15</sup> prospective outcomes studies evaluated and compared mastopexy, augmentation/

mastopexy, and reduction from the patient's perspective. However, the Swanson study was biased by very short follow-up and lack of anonymity.

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Current generic breast questionnaires were not designed to assess surgical changes.<sup>14</sup> Pusic et al<sup>21-23</sup> have developed an outcome measure for breast surgery, the BREAST-Q questionnaire, which provides 3 general indices: breast satisfaction, psychological well-being, and sexual well-being. However, it does not provide data regarding the recovery experience or procedure-related questions that may be of clinical interest to the patient and surgeon.

We conducted a literature search on patient-reported data, including effects on patient satisfaction. In 2013 Kalaaji et al published results of an anonymous study about QoL in breast augmentation.<sup>24</sup> To our knowledge, no published study comparatively describes the quality of life results described by patients of breast augmentation and augmentation mastopexy using an anonymous method.

Published (and somewhat worrisome) data about women seeking breast surgery indicate that this patient group have documented a high incidence of psychiatric diseases, such as depression, and a high suicide rate.<sup>25-29</sup> This was not confirmed in a previous study of breast implant patients.<sup>24</sup>

The aim of this study was therefore, to draw comparisons between different aspects of Quality of Life between patients who underwent breast enlargement with implants and those who received augmentation mastopexy. We wanted to show the impacts both procedures had on the patient's life and to comment on reported changes. Furthermore, we wanted to know whether the complexity of and the results obtained with augmentation mastopexy differ from those with implants in regard to quality of life. We investigated patient characteristics, depression rate, motivation, and possible increase in postoperative QoL for psychosocial and cosmetic aspects between the two groups. Questions concerning age, relationship status, number of children, level of education, other epidemiologic aspects, and the effect procedures had on activities of daily living/work were included in the questionnaire.

## METHODS

This retrospective study was conducted using the QuestBack return mail system (QuestBack AS, Oslo, Norway), which automatically processed survey answers anonymously and sent the results as diagrams to the authors. This system not only guarantees full anonymity to the patient, but also ensures unaffected results, thereby reducing bias. By registering the e-mail addresses of all our patients in our records, we could send the questionnaire by e-mail.

The authors created a questionnaire consisting of 47 validated questions regarding patient characteristics and epidemiologic background, mental health, activities of daily living/work, and psychosocial and cosmetic changes (Appendix A). Additional questions addressed patient motivation to undergo cosmetic surgery and whether the patient would recommend their procedure or a similar one to somebody else. Although the motivation for surgery is generally

cosmetic as in all aesthetic surgery, it is important to include more specific reasons. Answer options for motivation were therefore divided to physical/practical (for example size difference made it hard to find bra, back and/or shoulder discomfort), emotional (reduced self-esteem, effects on the mood, and feeling confident, etc.), cosmetic (not satisfied with the appearance of the breasts), and intimate (in relation to partner). This questionnaire was first conducted as a means for our previously published article from 2013.<sup>24</sup> For our current study, we added specific questions concerning the augmentation mastopexy patients. The questionnaire was validated by a selected number of five patients. They were first contacted by telephone by one coauthor and asked to validate the questions via mail. Patients were asked to give feedback on the quality of questions, the questionnaire's length, and their comprehension. In addition, we also worked together with a professional language expertise to improve our questionnaire's quality. The authors followed Norwegian guidelines regarding consent, and the guiding principles from the Declaration of Helsinki. As mentioned above, the study was conducted anonymously and based upon our previously published article that used the same methods and followed Norwegian ethical guidelines as well. Hence, there was no need for this study to be further approved by an institutional review board. Patients were informed about the study beforehand by telephone and they gave their consent to us to use their answers anonymously.

The questionnaire for the AM group contained additionally specific questions (Table 1) regarding patient satisfaction with the results after surgery, such as the degree of lift, shape of the nipple and breast after surgery, and scarring. A total of 95 consecutive patients who underwent breast surgery at Oslo Plastic Surgery Clinic between January 2005 and January 2009 participated in the study: 61 patients who underwent breast enlargement with implants and 37 patients who underwent augmentation mastopexy. Over the four-year period we had 121 breast implant patients. The number of patients, who were e-mail reachable, had follow up for over one year, and were willing to participate in the study, was 93. Sixty-one (61) responded, giving us a response rate of 67%. For the augmentation mastopexy the overall patient number was 61. The number of patients who fulfilled our criteria was 42, and the response rate ended up as 88%. Patients who were followed up less than 1 year and those who were not reachable by e-mail were excluded. The indications for undergoing surgery were mainly hypoplasia mamma for the impant (BI) group. For the augmentation mastopexy (AM) group the indications were skin and/or glandular ptosis which required augmentation in addition to lifting.

Answers were graded on a 5-point scale: 1 (much worse); 2 (worse); 3 (as expected/no change); 4 (better), and 5 (much better). For the sake of statistical analyses, the scales were confined to 3 scales: lesser degree (1 and 2 were merged), no change, and greater degree (4 and 5 were merged).

**Table 1.** Specific Questions for the Mastopexy Augmentation Group Measured by Patient's Subjective Evaluation

| Augmentation mastopexy                       |                      |                  |                       |
|--|----------------------|------------------|-----------------------|
| How satisfied are you with the:              | Lesser degree, n (%) | No change, n (%) | Greater degree, n (%) |
| Degree of lift after surgery                 | 7 (19.5)             | 5 (13.9)         | 25 (66.7)             |
| Location of the nipples                      | 10 (27.0)            | 5 (13.5)         | 22 (59.4)             |
| Size of the areola                           | 7 (19.4)             | 5 (13.9)         | 25 (66.7)             |
| Sensation of the nipples                     | 10 (29.7)            | 7 (18.9)         | 20 (54.0)             |
| Breast shape after surgery                   | 8 (22.3)             | 5 (13.9)         | 24 (63.9)             |
| Are the scars on the breasts as you expected | 15 (40.5)            | 13 (35.1)        | 9 (24.3)              |

Regarding the operation, all operations were performed by one surgeon (the main author, A.K.). The submammary incision was used in the implant group. In the AM group the technique we used was vertical technique similar to Lejour/Lassus-type mastopexy with the nipple-areola sliding technique (superior pedicle) with lifting the deepithelialized lower pole around the implant up to the pectoral fascia fixating with polydioxanone sutures then approximating the skin flaps vertically. Sometimes a minor excision of the gland in the lower part is performed when excess of it exists. The marking was mainly preoperative and could be adjusted minorly perioperatively. The pocket placement in both groups was either subglandular, submuscular, or subfascial.

The brand name of the round implants we used was McGhan Soft Touch Cohesive Gel-Filled breast implants (INAMED Aesthetics, Santa Barbara, CA). For shaped implant indications we used CUI Anatomical MicroCell Textured Cohesive Gel-Filled breast implants (INAMED Aesthetics).

## Statistical Methods

The cross-tabulation of the responses of the patients by surgery group shows a small number in the resulting cells. The *P* values based on the usual asymptotic chi-square distribution are often biased. More suitable methods for testing statistical hypotheses according to statistical methodology in such tables are a category of tests commonly known as permutation tests.<sup>30</sup> The *P* values in these tests are based on the exact distribution of a statistical function of the responses under the hypothesis of equality of the groups or a Monte Carlo approximation of this distribution. In Tables 2 and 3 in which the responses are in nominal scale, the hypothesis of equality of surgery groups was tested with *P* values based on the exact distribution of the Pearson chi-square statistic. In Tables 4 to 6, in which responses are ordered, the *P* values for testing equality were based on the exact conditional distribution of Cochran-Armitage trend statistic. We used the R system

**Table 2.** Age of Patients

|             | Augmentation with implants, n (%) | Augmentation mastopexy, n (%) |
|-------------|-----------------------------------|-------------------------------|
| <18 years   | 1 (2.0)                           | 0 (0)                         |
| 18-21 years | 12 (20.4)                         | 6 (15.2)                      |
| 22-25 years | 11 (18.4)                         | 6 (15.2)                      |
| 26-29 years | 6 (10.2)                          | 6 (15.2)                      |
| 30-33 years | 8 (14.3)                          | 6 (15.2)                      |
| 34-37 years | 7 (12.2)                          | 6 (15.2)                      |
| 38-41 years | 5 (8.2)                           | 4 (12.1)                      |
| 42-45 years | 5 (8.2)                           | 4 (12.1)                      |
| >45 years   | 3 (6.1)                           | 0 (0)                         |

*P* = 0.7673.

for statistical computing, version 3.4.0 (R Core Team 2017, R Foundation for Statistical Computing, Vienna, Austria), and specifically the “coin” add-on package version 1.2-1.<sup>31</sup>

## RESULTS

### Patients

The response rate of the survey was 67% in the BI group (of 93 patients) and 88% in the AM group (of 42 patients). Average follow-up time was 2.8 years in both groups (range, 1-5.8 years). The age distributions in both patient groups are presented in Table 2.

The average age was 30 years (range, 18-59 years) in the BI group and 34 years (range, 20-59 years) in the AM group. There was no significant shift in location of the distributions in the two groups (*P* = 0.767). In the BI group, 33.5% of the patients had two children, 32.8% had no children, 19.0% had one child, and 10.3% had three children. In the AM group, most patients had two children (51.4%), and the percentage of women with

**Table 3.** Type of Work in Breast Augmentation Patient Population

|                                 | Augmentation with implants, n (%) | Augmentation mastopexy, n (%) |
|---------------------------------|-----------------------------------|-------------------------------|
| Physical/manual work            | 17 (28)                           | 9 (24.3)                      |
| Office work                     | 13 (22)                           | 8 (21.6)                      |
| Physical/manual and office work | 13 (22)                           | 13 (35.1)                     |
| Work at home                    | 5 (8)                             | 3 (8.1)                       |
| Other                           | 12 (20)                           | 4 (10.8)                      |

$P = 0.6059$  for testing independence between work category and operation group.

no children, one child, or three children was similar at approximately 10% each. Of those undergoing BI, 77.6% were in a relationship by the time of operation, whereas 22.4% were not. In the AM group, the percentage of patients in a relationship was slightly higher at 86.5%, whereas 13.5% of patients were not in a liaison. Regarding the completed level of education, the result is almost identical in both groups. For the BI group 53.4% had completed high school, and 36.2% had completed university/college. For the AM group the numbers were 51.4% and 29.7%. More than 75% of patients had finished high school or college in both groups. When it comes to patient careers, the results are evenly distributed between both groups. Options included manual work, office work, combined manual and office work, stay at home parent, and other. In the group who underwent AM, a slight majority constituted a choice of career in physical/manual and office work (35.1%) (Table 3); however, this was not significant ( $P = 0.6059$ ). The distribution of annual patient income shows some differences. Of all patients who chose implants, 17.6% had an annual income higher than 50,000 USD, as did 29.9% of the patients who chose AM. The cost for a breast implant surgery is around 4500 dollars and for augmentation mastopexy around 6500 dollars. However, this is not the net worth of the patients in Norway, so it is affordable.

For the breast implant group, the percentage of anatomically shaped implant was 27.8%, and 72.2% for the round implants. The same percentage for augmentation mastopexy was 13.5% and 86.5%. For the breast implant group, the percentage of subglandular insertions was 46.9%, submuscular 42.9%, and subfascial 10.2%. The same percentage for the augmentation group was 45.2%, 51.6%, and 3.2%.

A limited number of patients were diagnosed with depression or were treated medically with antidepressants by the time of surgery: only 4 patients (6.9%) in the BI group and only 1 patient (2.7%) in the AM group. Out of the 4 in the BI group, 2 had no change, one improved, and

**Table 4.** Patient Motivation for Surgery<sup>a</sup>

|                   | Augmentation with implants, n (%) | Augmentation mastopexy, n (%) |
|-------------------|-----------------------------------|-------------------------------|
| Cosmetic reasons  | 40 (65)                           | 29 (77.8)                     |
| Emotional reasons | 29 (48)                           | 8 (22.2)                      |
| Intimate reasons  | 13 (22)                           | 3 (8.3)                       |
| Physical reasons  | 6 (10)                            | 11 (30.6)                     |
| Other             | 2 (3)                             | 0                             |

$P = 0.0057$  for testing independence between motivation category and operation group.

<sup>a</sup>Some patients gave more than one reason for surgery.

one became worse. Unfortunately, the number is too small to perform any statistical analyses.

## Motivation

When asked the following question, “Why did you choose to enlarge your breasts?” 65% of the patients in the breast enlargement group and 77.8% in the augmentation mastopexy group answered that they made their decision because of cosmetic reasons. Emotional reasons constituted 48% in the implant group and 22% in the augmentation mastopexy group. The differences were also obvious when it came to intimate and physical reasons: 22% and 8% as well as 10% and 31% in both groups (Table 4). These differences were statistically significant ( $P = 0.0057$ ).

## Psychosocial Changes

Herein, we analysed the psychosocial effects after surgery. The feeling that life had changed after surgery and feeling like a “whole” person was registered significantly ( $P = 0.0042$ ) in the implant group. There was no significant difference in regard to feeling feminine or if the operation had affected social skills (Table 5).

## Daily Activity and Work Activity

There were some positive effects in changes of motivation to perform daily activities and work in the breast implant group, but these changes were not significant. Approximately 72.1% of patients in the BI group and 89.2% in the AM group stated that they did not experience any noticeable changes in motivation to perform their daily activities (Table 6).

## Cosmetic Results

The satisfaction in BI group (80%) was higher concerning breast volume in comparison with the AM group (67%).

**Table 5.** Psychosocial Changes

| To what degree do you feel:               | Augmentation with implants |                  |                       | Augmentation mastopexy |                  |                       | P values* |
|---|----------------------------|------------------|-----------------------|------------------------|------------------|-----------------------|-----------|
|   | Lesser degree, n (%)       | No change, n (%) | Greater degree, n (%) | Lesser degree, n (%)   | No change, n (%) | Greater degree, n (%) |           |
| That life has changed                     | 1 (1.6)                    | 18 (29.5)        | 42 (68.9)             | 3 (8.1)                | 19 (51.4)        | 15 (40.5)             | 0.0042    |
| Like a "whole" person                     | 1 (1.6)                    | 15 (24.6)        | 45 (73.8)             | 2 (5.87)               | 20 (54.3)        | 15 (40.0)             | 0.0012    |
| Feminine                                  | 1 (1.6)                    | 3 (5.0)          | 8 (93.4)              | 2 (5.4)                | 10 (27.0)        | 25 (67.5)             | 1         |
| The operation affected your social skills | 1 (1.6)                    | 45 (73.8)        | 15 (24.6)             | 1 (2.7)                | 32 (86.5)        | 4 (10.8)              | 0.1491    |

\*P values refer to Cochran-Armitage test for equality of the ordered responses in the operation groups.

**Table 6.** Changes in Daily Activity, Work Activity, and Motivation

| To what degree do you feel that the operation has changed: | Augmentation with implants |                  |                       | Augmentation mastopexy |                  |                       | P values* |
|--|----------------------------|------------------|-----------------------|------------------------|------------------|-----------------------|-----------|
|  | Lesser degree, n (%)       | No change, n (%) | Greater degree, n (%) | Lesser degree, n (%)   | No change, n (%) | Greater degree, n (%) |           |
| Motivation for daily activity                              | 1 (1.6)                    | 44 (72.1)        | 16 (26.3)             | 0 (0)                  | 33 (89.2)        | 4 (10.8)              | 0.1464    |
| Motivation for work activity                               | 1 (1.6)                    | 52 (85.2)        | 8 (13.2)              | 0 (0)                  | 36 (97.3)        | 1 (2.7)               | 0.2052    |
| Effectiveness in work                                      | 1 (1.6)                    | 54 (85.5)        | 6 (9.9)               | 0 (0)                  | 36 (97.3)        | 1 (2.7)               | 0.4733    |

\*P values refer to Cochran-Armitage test for equality of the ordered responses in the operation groups.

However, this difference was not significant ( $P = 0.291$ ). Patients from the BI group were statistically more satisfied with the shape of their breasts than patients in the AM group (90.1% vs 63.9%;  $P = 0.0056$ ) (Figures 1 and 2).

Conversely, when it came to sensation of the skin on the breasts, the BI group scored 58.3% in satisfaction and the AM group scored 66.7%; nonetheless, the difference was not statistically significant ( $P = 0.4661$ ). Patient satisfaction regarding scarring on the breast after the surgery was significantly higher in the BI group than in the AM group (70.6% and 40.5%, respectively;  $P$  value = 0.0006).

Symmetry of the breasts after surgery was also an important parameter of patient satisfaction. Patients from the BI group were generally more satisfied: 83.6% of patients in this group were satisfied to a greater degree with the symmetry of their breasts. Comparatively, only 54.0% of patients in the AM group reported that they were satisfied. Most of the patients in both groups were satisfied with the softness of their breasts after surgery: 88.5% in the BI and 75.0% in the AM group. The appearance of nipple and areola scored a higher level of satisfaction in the BI group (78% vs 60% in the AM group ( $P = 0.0278$ )) (Figure 1).

Satisfaction with overall cosmetic result was very high, ranging from 93.4% in the BI group to a significantly lower but still high 69.4% in the AM group ( $P = 0.0007$ ) (Figure 2). Satisfaction with overall enlargement was higher in the BI group (90.2%), whereas 70.2% of the patients in the AM group reported more overall satisfaction beyond enlargement ( $P = 0.0041$ ) (Table 7).

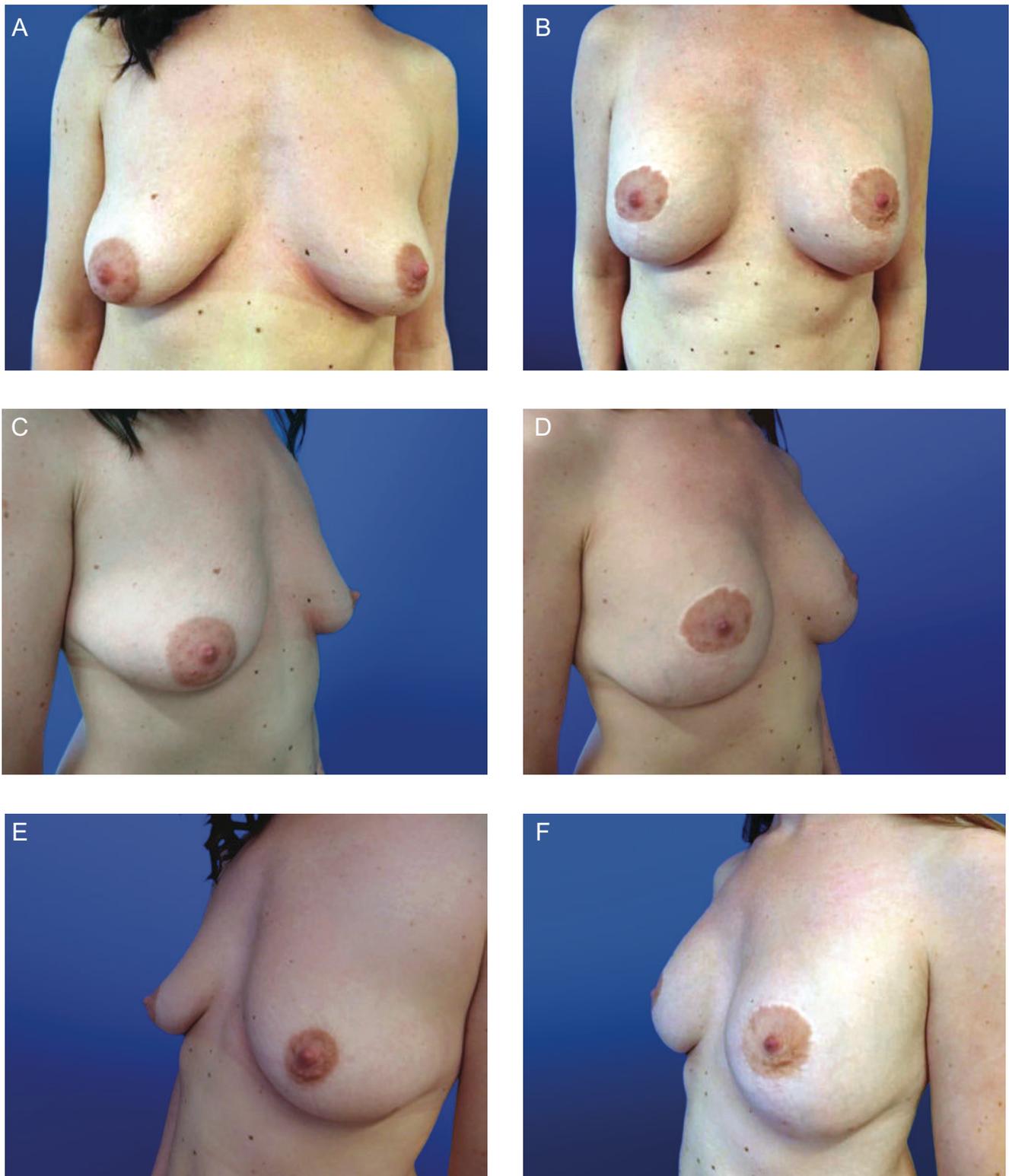
Specific questions were only designed for the AM group with respect to satisfaction: 66.7% of the patients reported a great degree of satisfaction with the lift; 59.4% were very content with the location of the nipples; and 66.7% were very happy with the size of the nipples. Only about half of the patients (54.0%) reported a great degree of satisfaction regarding sensation in the nipples. When asked whether the scarring on the breasts was as expected, 75.6% of the patients answered, "to a lesser degree" or "no change in satisfaction" (Table 7). These were descriptive pieces of data and therefore statistical analysis was not performed.

## Complications

Patients were also asked to comment on the complications which occurred after surgery. The following are the most common complications among both groups. BI patients reported a higher rate in "no complications" postoperative (78.1%) than AM patients (62.2%). BI had "Bleeding that leads to operation" in 1.7% vs 0% and "Rippling" in 15.3% vs 10.8%, respectively. Concerning "Capsular contracture that did lead to correction" it was noted as low incidence in both groups (1.7% vs 5.4%, respectively). While BI patients had no postoperative problems with seroma formation, 2.7% in the AM group experienced this complication. In our clinical records only two patients (3.2% and 5.4%, respectively) got an infection which needed to be treated. The patients in AM group expressed an incidence of "wound healing problems" (13.5%).



**Figure 1.** (A, C, E) This 25-year-old woman presented with moderate hypoplasia mammae before breast augmentation. (B, D, F) Twelve months after submuscular augmentation mastopexy with 275-gram silicone gel round implants.



**Figure 2.** Average scar quality and cosmetic results after mastopexy augmentation. (A, C, E) This 29-year-old woman with mammary ptosis prior to undergoing augmentation mastopexy. (B, D, F) Two years after submuscular augmentation mastopexy with 240-gram silicone gel round implants. Both skin removal and gland lifting were performed. There is a tendency to have slightly bottomed out breasts, which is not uncommon in long-term results.

**Table 7.** Satisfaction in Cosmetic Changes

| To what degree are you satisfied with:               | Augmentation with implants |                  |                       | Augmentation mastopexy |                  |                       | P values* |
|--|----------------------------|------------------|-----------------------|------------------------|------------------|-----------------------|-----------|
|  | Lesser degree, n (%)       | No change, n (%) | Greater degree, n (%) | Lesser degree, n (%)   | No change, n (%) | Greater degree, n (%) |           |
| Breast volume after operation                        | 10 (16.4)                  | 2 (3.3)          | 49 (80.3)             | 8 (21.6)               | 4 (10.8)         | 25 (67.5)             | 0.2911    |
| Breast shape after operation                         | 4 (6.6)                    | 2 (3.3)          | 55 (90.1)             | 8 (22.3)               | 5 (13.9)         | 24 (63.9)             | 0.0056    |
| Sensation of the skin on the breasts after operation | 16 (26.7)                  | 9 (15.0)         | 35 (58.3)             | 8 (22.2)               | 4 (11.1)         | 25 (66.7)             | 0.4661    |
| Scars on the breasts after operation                 | 9 (14.7)                   | 9 (14.7)         | 43 (70.6)             | 18 (48.6)              | 4 (10.8)         | 15 (40.5)             | 0.0006    |
| Symmetry between the breasts after operation         | 8 (13.1)                   | 2 (3.3)          | 51 (83.6)             | 13 (35.1)              | 4 (10.8)         | 20 (54.0)             | 0.003     |
| Softness of the breasts after the operation          | 2 (3.3)                    | 5 (8.2)          | 54 (88.5)             | 4 (11.1)               | 5 (13.9)         | 28 (75.0)             | 0.0837    |
| The nipple and the area around it after operation    | 5 (8.4)                    | 8 (13.6)         | 46 (78.0)             | 9 (25)                 | 6 (15)           | 22 (60)               | 0.0278    |
| Cosmetic result as a whole                           | 2 (3.3)                    | 2 (3.3)          | 57 (93.4)             | 8 (22.2)               | 4 (11.1)         | 25 (69.4)             | 0.0007    |

\*P values refer to Cochran-Armitage test for equality of the ordered responses in the operation groups.

## Expectations and Recommendation

When answering the question, “To what degree does the result match the expectations you had before surgery?” 89% of patients in BI group stated, “as expected or better,” whereas 73% reported “as expected or better” in the AM group ( $P = 0.0786$ )

Furthermore, patients were asked whether they would recommend this type of surgery to a friend, based on their own experience: 82.5% of patients from the implant group and 64.9% of the patients from the AM group answered that they would. However, 15.8% vs 21.6%, respectively, said they would “maybe recommend” the procedure. The “no recommendation” alternative scored only 1.8% and 13.5%, respectively ( $P = 0.01838$ ).

## DISCUSSION

The aim of this study was to focus on the patient’s outcome of satisfaction and to show the different impacts on quality of life among both patient groups after the procedure was performed. It is important to point out that the focus mainly lay upon a quality of life comparison and our aim was not to compare surgical procedures. Reporting on different aspects in AM patients, which were not reported on before such as the aspects of patient’s discontent, is a new field of research that will certainly provide new insights and guidelines for surgeons performing this procedure.

The motivation for undergoing surgery was primarily cosmetic in both groups. The BI group patients were significantly more satisfied with the final aesthetic result of their enlargement as well as their gain in quality of life.

Their overall satisfaction with their result, their breast volume, shape, scar, and symmetry were significantly higher compared to the AM group patients. A significant dissatisfaction was reported in patients of AM regarding shape, scarring, symmetry, and the nipple-areola complex. It is maybe not surprising that the BI group was more satisfied with for example their scars since the scars are smaller compared to the scars in augmentation mastopexy. It is also possible to think that the reason the BI group is more satisfied with breast volume and shape is that they were not ptotic to start with. We mean that the satisfaction aspect is complex, hence the importance on asking these questions. Furthermore, there might be other factors for dissatisfaction in the BI group than only ptosis, such as not being satisfied with the shape due to a submammary fold, the form of the breast, and asymmetry to name some.

It is true, that some patients were blinded by a so-called unrealistic optimism resulting in less than expected results and thus minimizing their level of satisfaction. We therefore acknowledge that there is a stronger need for proper patient education preoperatively. Furthermore, we need to adjust standard protocols that will enable us to better select patients. Finally, there should be a stronger emphasis on patient revision and correction to minimize discontent in AM patients.

Psychosocial effects after surgery were presented by asking patient’s if their feelings towards being a “whole” person had changed after surgery. Breast implant patients stated that surgery changed their life and made them feel like a “whole” person again. The description “whole” person integrates body, mind, and psyche and means that people are comfortable and satisfied with their appearance and physical traits. Any defect or abnormality is regarded

negatively and bothers their happiness resulting in a pessimistic perception of themselves.

The studies by Swanson<sup>14,15</sup> showed a high level of satisfaction with mastopexy patients. However, bias was unavoidable because the nurse who conducted the interview was not independent. Follow-up times in this study were comparatively short. Mean follow up was 3.9 months; however, some patients were interviewed as early as 1 month after surgery, particularly if it seemed unlikely that they would return for a follow-up appointment.

AM is more complex and surgically more challenging than BI.<sup>11,14,21-23,32-36</sup> The Spear et al<sup>11</sup> study on 13 AM patients concluded that aesthetic results for augmentation and mastopexy truly depend on many different factors that must work in harmony to yield an excellent result. Second, what is aesthetically pleasing to the surgeon may not be pleasing to the patient, and vice versa. Thirdly, although the patients' aesthetic results were good, they were not consistently rated as excellent, nor were the patients totally satisfied with their outcomes.<sup>11</sup> This perhaps reflects the more complex nature of both the patient's problems and the surgical procedure itself. Nipple/areola size and sensation, scars, breast size and shape, and symmetry are all key components in creating the desired breast with the adequate amount of lift. Enlarged areolae or bad scarring can worsen otherwise good results. Additionally, if scarring is acceptable but symmetry and appropriate shape are absent the results may suffer. However, the results were based on relatively few patients and on a nonanonymous study and aimed to evaluate the 1-stage augmentation mastopexy, which should show satisfactory results in size and lift, areolae, and softness.

We agree with these conclusions. This could explain the differences in satisfaction between the two groups given that the women in the BI group were generally more satisfied with the outcome. Furthermore, expectation of the result could be high and unrealistic in the AM group, resulting in less-than-expected scoring of the results after surgery. Therefore, it is considered indispensable for the surgeon in charge to inform the patient about realistic results and expectations and to ameliorate our techniques to more satisfy the patients in these regards.

The current study was built on what was previously published in 2013 for breast augmentation,<sup>24</sup> in which the same questions were used for the mastopexy augmentation group, which provides a good opportunity for comparison of consecutive patients whose surgeries were performed by the same surgeon.

The top motivational factor for undergoing surgery in both groups was cosmetic. This implies that these women were eager to change their physical attributes to make themselves look more attractive. These cosmetic changes were therefore firstly meant to improve their appearance. Second reason was emotional for the implant group and physical for the augmentation mastopexy. The statistically significant

difference in satisfaction concerning cosmetic results in patients from the BI group compared with the AM group, regarding the shape of their breasts, scarring, symmetry of the breasts, and satisfaction with the nipple and areola illustrates the complexity of the augmentation mastopexy procedure and the need to better refine our used techniques in AM.

Because cosmetic motivation scored highest in both groups, the importance of cosmetic satisfaction is evident, even when the patient has two different diagnoses. The physical motivation for augmentation mastopexy could be explained by the discomfort women experience from ptotic breasts and the need to adjust the ptosis with a bra highlights the complexity of this condition for women. However, in the BI group, the second most common motivational factor for undergoing breast augmentation was emotional (ie, feelings of reduced self-esteem).<sup>37-42</sup> The little effect seen on daily activities and work activities in both groups could be explained by the fact that self-esteem in women tends to increase as they get older.<sup>43,44</sup>

Although some patients reported that they were diagnosed with depression or were treated with antidepressants, the depression rate in our study was still lower than the range in the general population in Norway, which is 7% to 17%.<sup>24,27-29,45-52</sup> It is important to keep in mind that that our sample size is relatively small. However, we have a 5 million population and we were merely stating the tendency in our sample compared to the Norwegian population. Putting together both groups (BI and AM) adds up to almost 100 patients and we can easily compare it to the depression rate in Norway, which is 7% to 17%.

Cosmetic results showed an improvement, though nonsignificant, in the BI group compared with AM group in terms of breast volume and the softness of the breasts after surgery. This could be explained because larger implants were not chosen in mastopexy, as this will accentuate hanging and the areola postoperatively. The improvement in softness reported in the BI group could be explained by differences in the quality of skin. Putting all these factors together, it was no surprise that the satisfaction with overall cosmetic results and with overall enlargement was significantly higher in the BI group than in the AM group.

A challenge for the surgeon is the relatively high percentage of reduced sensitivity in the skin of the breasts after surgery, which was seen in both groups.

The less favourable results with AM should encourage surgeons to provide better information to our patients, improve our techniques, and follow our patients with anonymous surveys to improve our results. Multicenter studies should be performed before conclusions can be made. Therefore, it is crucial to continue and expand research on this topic, especially when considering patient satisfaction, QoL, and the overall cosmetic result.

It does not come as a surprise that 89% of patients in the BI group stated, “as expected” or “better,” while only 73% reported so in the AM group. This could be explained by higher expectations and/or the complexity of ptosis in the latter group. However, even with the less favourable results, the majority of patients would still recommend the mastopexy procedure to others. This shows us that the benefits of the procedure still overcome the nonfavourable aspect of the results.

The following study limitations were discovered: First of all, though some studies reported smaller samples, larger sample size than ours in both groups could be more representative of these patients. Secondly, we were not able to get hold of all patients in these two groups at our clinic. Some patients were not reachable via telephone or mail, therefore, we do not know whether they were satisfied or not with their cosmetic outcome and if their answers would have changed our results. Thirdly, the means of measurement used to collect data in the form of our questionnaire was suitable for answering questions related to quality of life but could be supplemented by the BREAST-Q to cover more aspects of the surgery. This will help to promote stronger an evidence-based approach for managing breast-surgery patients in further multicentre studies. Fourthly, the anonymity limits data interpretation, for example, implant volumes and resection weights are evidently not available, but this information is needed when comparing responses to questions concerning breast size and feel. Other valuable data related to implant type and placement are unavailable. However, we consider the anonymity to be a strength considering all answers from patients are completely honest. We agree though with the limitation. We could have done cross-tabulation for many of these variables. However, this would have taken us far from the main aim of the study. Alternatively, we could have divided the group into many subgroups, but this again would make the statistics unreliable because of the limitation of numbers.

Regarding skin sensations, the relatively higher level of satisfaction in the AM group can be explained by the fact that in some severe ptotic breasts with hypertrophy of the skin, the sensibility of the skin could be impaired. After surgery where excess skin is reduced it might give more regenerative effect to the cutaneous nerves so we would expect an improved sensibility as seen here in the AM group. However, the numbness after augmentation mastopexy is high and likely related to the superior pedicle technique.<sup>53</sup>

Concerning the high rate of self-reported complications, it seems the rate of complication in the AM group is high, however, this a patient reported outcome and not clinical one, and we feel patients tend to describe more freely minor problem like in wound healing as a major complication. The scar evidently is an area of concern for the patients and should be for us too to ameliorate our technique. Needless to say, this is anonymous study

and patients feel free to report. The overall results are still thought satisfactory in doing the procedure.

## CONCLUSIONS

The study included patients in both groups from a variety of backgrounds, age, socioeconomic status, and education level. Therefore, stereotyping of patients undergoing cosmetic surgery was not found in our two groups. Most patients were in a relationship and had children before the surgery. The depression rate was lower than in the general population in Norway in both groups. Motivation for undergoing surgery in both groups was topped by cosmetic reasons. Followed in second place by emotional reasons for the BI group and physical reasons for the AM group.

The effects on psychosocial aspects were significantly better in the BI group regarding the feeling that life had changed after the operation and feeling like a “whole” person. There was no significant difference when it came to feeling feminine or for social skills. Although there were some positive effects on daily life and work activities in the breast implant group, these changes were not significant. Improvement in breast volume and the softness of breasts after surgery was not significant in the BI group compared with the AM group. Greater satisfaction was significant in patients from the BI group compared with the AM group regarding the shape of their breasts, scarring, symmetry of the breasts, and the nipple and area surrounding.

Furthermore, satisfaction with overall cosmetic results and with overall enlargement was significantly higher in BI group than AM group. The less favourable results with AM show the importance of providing better information to our patients, improving our techniques, and following up with our patients using anonymous surveys to improve our results. Multicenter studies should be performed before final conclusions can be made. Therefore, it is crucial to continue and expand research on this topic, especially when considering patient satisfaction, QoL, and the overall cosmetic result.

## Supplementary Material

This article contains supplementary material located online at [www.aestheticsurgeryjournal.com](http://www.aestheticsurgeryjournal.com).

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