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Evaluation of Quality of Life (BREAST-Q) and Scar Quality (POSAS) after Breast Augmentation

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Inhaltsverzeichnis

Abkürzungsverzeichnis

MD:	Medical Doctor
No.:	Number
POSAS:	Patient and Observer Scar Assessment Scale
QOL:	Quality of life
SD:	Standard deviation
vs:	Versus
P:	P-value
y:	Years

1. Zusammenfassung

Diese Studie untersucht die Auswirkungen von Brustvergrößerungen auf Frauen, die sich in Deutschland einer Operation unterzogen haben, hinsichtlich ihrer Lebens- und Narbenqualität anhand von Fragebögen aus Patientensicht. Das Ziel dieser Studie war es festzustellen, ob sich die Lebensqualität der Frauen nach der Operation im Vergleich zur präoperativen Situation verbessert, und ihre postoperative Narbenqualität zu bewerten.

Hierzu wurde eine prospektive, monozentrische Studie an 50 Frauen durchgeführt, die sich zwischen Oktober 2018 und Dezember 2020 einer Brustvergrößerung mit nanotexturierten, silikongefüllten Implantaten unterzogen haben. Von diesen Frauen nahmen 21 (42%) an der präoperativen Umfrage (BREAST-Q) und 50 (100%) an der postoperativen Befragung (BREAST-Q und POSAS) teil. Wir verwendeten den BREAST-Q-Fragebogen um die Lebensqualität der Patientinnen zu messen und den „Patient and Observer Scar Assessment Scale“ (POSAS) zur Bestimmung der Narbenqualität.

Das psychosoziale Wohlbefinden stieg gemäß dem Q-Score um 34,3, das sexuelle Wohlbefinden um 35,7 und die Zufriedenheit mit den Brüsten um 48,8 Punkte. Das körperliche Wohlbefinden nahm um 12 Punkte ab. Der Mittelwert des POSAS liegt nach Angaben der Patienten/ des Beobachters bei 3,8/ 2,5 Punkten für inframammäre Narben und 4,4/ 3,1 für periareoläre Narben.

Schlussfolgernd haben wir in dieser Studie festgestellt, dass eine ästhetische Brustvergrößerung mit nanotexturierten, silikongefüllten Brustimplantaten mit einer signifikant höheren Patientenzufriedenheit verbunden ist, was auf eine Verbesserung der Lebensqualität der Frauen hinweist.

2. Einleitung (Introduction)

Breast augmentation remains to be the most common cosmetic surgical procedure. The International Society of Aesthetic Plastic Surgery reported that nearly 1,800,000 procedures were performed in 2019 worldwide.[1] Germany positioned itself in 5th place with more than 66,000 operations.[1] There are various and very individual reasons for breast augmentations. Many women who choose to undergo an operation may have experienced poor body image, depression, low self-esteem, and psychosexual problems.[2] Furthermore, there is a correlation between body image and self-esteem and between depression and self-esteem. Low body image can lead to a lack of self-esteem, which can result in depression.[3] Breast augmentation is a very low-risk procedure that leads to beautiful results and high satisfaction. However, it is an elective surgery, and serious risks are also described, such as capsular fibrosis and breast implant-associated anaplastic large cell lymphoma (BIA-ALCL).[4] Therefore, it is important to continuously monitor the quality of the surgical technique and the results.

Traditionally, the results of breast augmentation have been evaluated mainly from the surgeon's point of view. Nowadays, the importance of patients' subjective feelings is increasing more and more and contributes significantly to how the final result is evaluated. The same applies to scars. The study of Randquist et al.[5] from 2018 showed that the overall opinions of physicians about scars were similar to those of their patients. However, the opinions of the physicians were somewhat more positive than those of the patients.

Scars play an important role in the outcome and patient satisfaction after an aesthetic operation.[5] A scar develops whenever skin tissue is destroyed down to the dermis. Lost or damaged skin is usually replaced with fibrous tissue. The appearance of a scar depends on many factors, such as the skin type, the location on the body, the age of the person with the scar, the age of the scar itself, and light exposure during the healing process. The character and extent of the injury are also important. Scars can be aesthetically disturbing and sometimes cause pain or itching, often long after they have formed.[6]

There have been various studies showing improvements in quality of life as well as psychosocial and sexual well-being after primary breast augmentation.[7–13] In this study, the quality of life after breast augmentation with nanotextured silicone-filled implants was analyzed using the BREAST-Q questionnaire and by examining and quantifying scarring using the Patient and Observer Scar Assessment Scale (POSAS). The purpose of this study is to determine if there is an increase in women's quality of life after surgery compared to preoperative.

3. Material und Methoden (Patients and methods)

This prospective monocentric study was conducted between October 2018 and December 2020 on 50 women who underwent breast augmentation with nanotextured silicone-filled implants in the St. Vinzenz-Hospital in Cologne, Germany. Of these women, 21 (42%) participated in the preoperative survey (BREAST-Q), and 50 (100%) participated in the postoperative survey (BREAST-Q and POSAS). Patient data were collected from all women who underwent breast augmentation during this period, including age, body mass index (BMI), and type and size of implants. Ethical approval according to the Helsinki guidelines was obtained from the responsible ethics committee.

The women were asked to complete the BREAST-Q questionnaire in a non-anonymous fashion. They were also examined by the study physician regarding scarring, and the POSAS questionnaire was completed by both the patients and the physician. The interval between the surgery and the examination date varied among the women. The shortest interval post-surgery was three months, and the longest was 27 months. The women were divided into three groups: three to six months, six to 12 months, and more than 12 months postoperative. The questionnaires were completed in person and online.

The BREAST-Q is a questionnaire that has been found suitable to measure patient-reported outcomes after breast augmentation, breast reconstruction, and breast reduction.[14,15] The augmentation module consists of two themes: Health-Related Quality of Life (QOL) and Patient Satisfaction. The Quality of Life theme includes three subthemes: psychosocial well-being, sexual well-being, and physical well-being. The psychosocial well-being scale contains nine items and queries about body image, a woman's confidence in social settings, and self-esteem. The sexual well-being section contains five items and questions about sexual attractiveness and sexual confidence regarding one's breasts and the comfort that a woman feels during sexual intercourse. The physical well-being section contains seven items and asks about pain or problems with the women's breasts. Patient satisfaction also has three subthemes: satisfaction with breasts, satisfaction with outcome, and satisfaction with care. These scales include items asking about the breast appearance and the overall appraisal of the outcome of the breast surgery. Satisfaction with care includes satisfaction with information, the surgeon, the medical team (other than the surgeon), and the office staff.[16]

The evaluation of the BREAST-Q questionnaires was done with the aid of a conversion table, which is given with each subtheme provided within the BREAST-Q questionnaire itself. The scores range from 0 to 100. The higher the scores, the more favorable the results. In summary, the BREAST-Q questionnaire is a highly comprehensive and useful questionnaire for evaluating the quality of life of women who have undergone breast augmentation. In addition, BREAST-Q is the only questionnaire in the field of breast augmentation surgery that complies

with international standards for the development of questionnaires and is recommended as a possible standard PROM (Patient-reported outcome measures) for individual clinic analysis and quality assessment.[14,17]

Scar quality was examined using the Patient and Observer Scar Assessment Scale (POSAS).[18] The POSAS measures scar quality and assesses from both the patient's and the observer's point of view. The patient scale contains seven items asking about pain, itching, color, stiffness, thickness, irregularity, and the patient's overall opinion of the scar compared to their normal skin. The observer scale also contains seven items, asking about vascularity, pigmentation, thickness, relief, pliability, surface area, and the observer's overall opinion of the scar compared to normal skin. Both patient and observer scores range from 1 to 10. A score of 1 represents normal skin, and a score of 10 represents the worst scar imaginable. The POSAS is a valuable tool for analyzing the quality of a scar and combining patient and observer assessments. This has already been shown in various studies in the literature.[5,19–22]

4. Ergebnisse (Results)

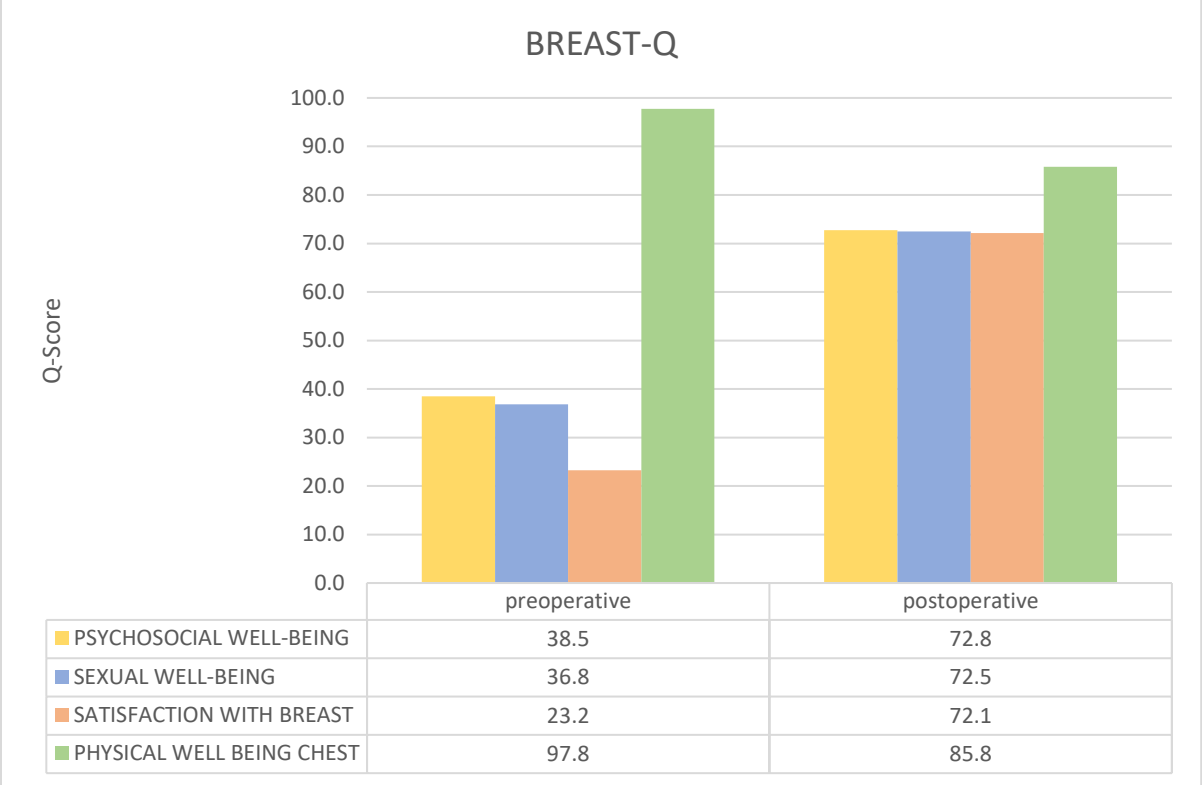
L This study surveyed 50 women, who received breast augmentations between October 2018 and December 2020. Of these women, 21 (42%) participated in the preoperative survey (BREAST-Q), and 50 (100%) participated in the postoperative survey (BREAST-Q and POSAS). The postoperative questionnaire was completed at different points between three months and 28 months after surgery. Patient information is listed in Table 1.

Table 1: Patient information

Patient factor	Number
Age (years): mean ± SD (range)	34.56 ± 7.75 (21–57)
BMI (kg/m^2): mean ± SD (range)	22.2 ± 2.3 (17–27.7)
Size of implant (cc): mean ± SD (range)	320.2 ± 45.2 (258–500)
Primary augmentation, No. (%)	48 (96)
Secondary augmentation, No. (%)	2 (4)
Concurrent mastopexy, No. (%)	22 (44)

The average age was 34.56 ± 7.75 years (range, 21–57 years). The average BMI was 22.2 ± 2.3 kg/m2 (range, 17–27.7 kg/m2). The average silicone implant size was 320.2 ± 45.2 cc (range, 258–500 cc). In 92% of cases, the subpectoral pocket was used. Statistically significant improvements were observed in three categories between preoperative and postoperative mean values: psychosocial well-being, sexual well-being, and satisfaction with breasts. The category of physical well-being, however, showed statistically significant deterioration. Psychosocial well-being improved from a mean value of 38.5 ± 15.5 preoperatively to 72.8 ± 16.6 postoperatively ($P < 0.0001$). The median rose from 37 to 74. Within this category, 84% of patients felt good about themselves, 78% felt attractive, and 84% felt self-confident most or all of the time postoperative (9%, 19% and 19% preoperative; raw score ≥4). This indicates an improvement from the preoperative values of 75%, 59%, and 65%. Sexual well-being improved from a mean value of 36.8 ± 14.9 preoperatively to 72.5 ± 16.8 postoperatively ($P < 0.0001$). The median rose from 36 to 73. Within this category, 86% of patients generally felt sexually attractive in their clothes, and 82% generally felt confident sexually about how their breasts looked when unclothed most or all of the time postoperative (38.1% and 4.8% preoperative; raw score ≥4). This indicates an improvement from the preoperative values of 47.9% and 77.2%. Satisfaction with breasts improved from a mean value of 23.3 ± 16.1 preoperatively to 72.1 ± 17.7 postoperatively ($P < 0.0001$). The median rose from 23 to 71. Within this category, 88% of patients were somewhat or very satisfied with the size of their breasts postoperative

(9.5% preoperative; raw score ≥3). This indicates an improvement from the preoperative value of 78.5%. Physical well-being, on the other hand, showed statistically significant deterioration from a mean value of 97.8 ± 5.7 preoperatively to 85.8 ± 15.8 postoperatively ($P < 0.0001$). The median sank from 100 to 91. Satisfaction with implants had a mean value of 85.3 ± 26.2 postoperatively with a median of 100. Satisfaction with outcome had a mean value of 77.7 ± 20.2 postoperatively with a median of 81. Within this category, 74% of patients definitely agreed that having this surgery changed their lives for the better postoperative (raw score 3). Satisfaction with information had a mean value of 75.6 ± 19.5 postoperatively with a median of 76. Satisfaction with surgeon had a mean value of 90.1 ± 12.4 postoperatively with a median of 100. Satisfaction with medical team had a mean value of 90.7 ± 18.6 postoperatively with a median of 100. Satisfaction with office staff had a mean value of 96.8 ± 9.8 postoperatively with a median of 100.



	preoperative	postoperative
PSYCHOSOCIAL WELL-BEING	38.5	72.8
SEXUAL WELL-BEING	36.8	72.5
SATISFACTION WITH BREAST	23.2	72.1
PHYSICAL WELL BEING CHEST	97.8	85.8

Diagram 1: Breast-Q Score preoperative vs. postoperative

Both the 50 patients and the physician filled out the POSAS regarding their inframammary scars, and 28 patients filled out the POSAS regarding their periareolar scars. As mentioned, both patient and observer scores ranged from 1 to 10. A rating of 1 represents normal skin, and a rating of 10 represents the worst scar imaginable. The patient scores regarding the overall opinion on the inframammary scars indicate a mean value of 3.8 ± 1.9 and a median of

3. In total, 56% of the patients specified scores of between 1 and 3 points. The observer scores regarding the overall opinion on the inframammary scars had a mean value of 2.5 ± 1.19 and a median of 2. In total, 84% of the patients' scars were scored between 1 and 3 points by the physician. The patient score regarding the overall opinion of the periareolar scars indicates a mean value of 4.4 ± 2.36 and a median of 3.5. In total, 50% of the patients specified scores between 1 and 3 points. The observer scores regarding the overall opinion of the periareolar scars had a mean value of 3.1 ± 1.42 and a median of 3. In total, 58.33% of the patients' scars were rated between 1 and 3 points by the physician. The comparisons of patient and observer scores are shown in Diagram 2 for inframammary and Diagram 3 for periareolar scars.

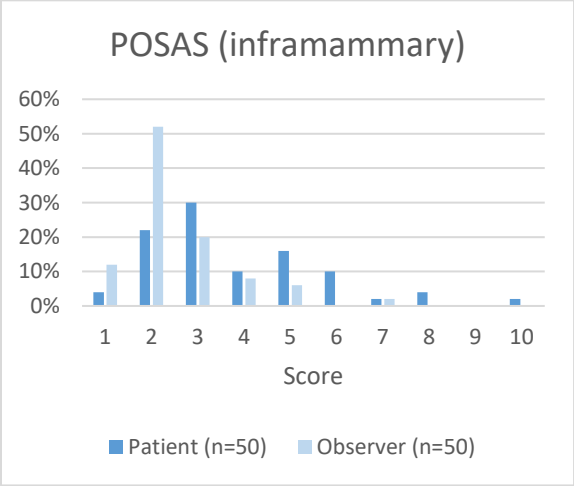


Diagram 1: Point distribution of patient and observer scores (inframammary)

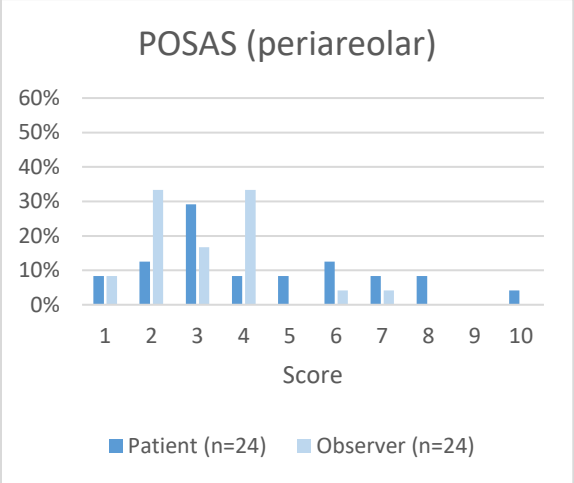


Diagram 2: Point distribution of patient and observer scores (periareolar)

Table 2 lists the POSAS mean values with standard deviations of patients and observers for total and each group separately, both in terms of inframammary and periareolar scars. In Table 2, it can be seen that the inframammary scars were rated better overall than the periareolar scars by both the patients and the observer. It can also be seen that the observer generally evaluated the scars better than the patients. It is also clear that the inframammary scars were rated best by the patients from the group that was more than 12 months past their surgery dates and that the observer confirmed this in his assessment.

Table 2: Patient and observer scale (inframammary/ periareolar), total and groups

POSAS scores				
	total (n=50)	3–6 months (n=7)	6–12 months (n=15)	>12 months (n=28)
Patient scale (inframammary), mean ± SD	3.8 ± 1,9	5.3 ± 2	3.9 ± 1.3	3.4 ± 2
Observer scale (inframammary), mean ± SD	2.5 ± 1.2	3.9 ± 0.9	2.6 ± 1	2.1 ± 1.6
Patient scale (periareolar), mean ± SD	4.4 ± 2.4	5 ± 2.2	3.5 ± 2.2	4.4 ± 2.6
Observer scale (periareolar), mean ± SD	3.1 ± 1.4	3.7 ± 1.5	2.3 ± 0.8	3.1 ± 1.2

5. Diskussion (Discussion)

The present study is one of few studies in the literature investigating the short-term and long-term satisfaction of women who received breast augmentations with nanotextured silicone-filled implants in Germany. As reflected by their scores on multiple scales of the BREAST-Q Augmentation Module, the results of this study indicate that these women showed significant improvements in quality of life.[16] Using the POSAS, it was determined that the assessments of scarring by both patients and the physician tended to show similar positive results overall.[18] In addition, we noticed that regarding the inframammary incision, the more time that had passed from the surgery, the better the assessments of the scars were.

The purpose of aesthetic surgery is to improve the patient's quality of life by increasing self-esteem and self-confidence. In order to achieve this goal, it is of significant importance to correctly understand the patient's ideas in advance and to discuss them together with the patient, as each person has his or her own subjective idea of aesthetics. On this basis, a satisfactory result for the patient can be achieved. Postoperative assessment and evaluation of the patients are also very important, as they provide information about whether and how satisfied the patient was with the joint planning, the information, the operation, and the result. To collect all this information, an internationally valid, tested, and reliable survey tool is needed. We decided to use the BREAST-Q Augmentation Module, which has already been tested and used in various studies in the past and is well-suited for comparing the results with other studies.[8–10,12,14–17,23] In addition, in the assessment of scars, the subjective assessment of the patient in addition to the assessment of the physician is of significant importance. Therefore, we decided to use the POSAS, which fulfills these requirements and has also been used elsewhere in the literature.[5]

Breast augmentation remains the most common cosmetic surgical procedure and is associated with an improvement in quality of life. This is also reflected by the high satisfaction rates described in the literature.[8–12] Young et al.[24] reported that 88% of women who underwent breast augmentation were satisfied with the results, and 82% experienced improvements in self-confidence. In our study, we also noted a clear, significant increase in breast satisfaction among patients. In total, 81% of the patients were very dissatisfied with the size of their breasts before surgery, and none were very satisfied, whereas postoperatively, 28% were somewhat satisfied, and 60% were very satisfied.

Apart from the physical change, which was seen as an improvement by the patients and is reflected in the satisfaction with their breasts, breast augmentation also has a significant influence on the psyche. This effect is reflected in the category of psychosocial satisfaction, which in our study also shows a significant increase compared to preoperative values. In total,

78% of patients felt attractive most or all of the time after the procedure, and 84% felt self-confident.

In addition, intimate relations in or outside of a partnership or marriage are positively influenced by breast augmentation. In this study, the mean value in the category of sexual well-being improved from 36.8 points preoperatively to 72.5 points postoperatively on the BREAST-Q scale. This indicates that breast augmentation has a significant impact on the sexual life of patients.

For all the improvements in the categories of satisfaction with breasts, psychosocial well-being, and sexual well-being, we noted a deterioration in the category of physical well-being in this study. The mean value of 97.8 points preoperatively decreased to 85.5 points postoperatively on the BREAST-Q scale. This can most likely be attributed to the following things. In 92% of the patients, the implants were placed in the submuscular pocket, dual plane I. The preparation of the implant pocket under the pectoral muscle may have contributed to increased postoperative pain. Furthermore, wound pain can occur after every surgical intervention where skin incisions are made.

Satisfaction with the scars is also an essential part of satisfaction with the final result. Scars can bother patients as visible consequences of surgery. Especially excessively raised, depressed, wide or erythematous scars, because of their aesthetically unappealing appearance. However, scars can also cause pain, tightness or itching. To prevent or improve scars, products such as silicone can be used, which seem to have high efficacy.[25] Through the POSAS, we were able to gain insights into how satisfied the patients and the doctor were with the resulting scars. Overall, it can be said that both the patients and the physician were predominantly satisfied with the scars. The average patient score for inframammary scars was 3.8 out of 10 for all patients, where, as mentioned above, 1 represents normal skin and 10 represents the worst imaginable scar. The average observer score was 2.5 out of 10 for inframammary scars for all patients. It is noticeable that the observer had an overall more positive impression of the scars than the patients themselves. This was also evident in the assessment of the periareolar scars. Here, the average patient score was 4.4, and the average observer score was 3.1. If we look at the scores of the patients in the three temporally subdivided groups, we can see that the assessment of the inframammary scars by both the patients and the observer was more positive the more time had passed since the operation. This effect is not observed for the periareolar scars.

The fact that the observer's assessments of the scars were better than those of the patient could be due, among other things, to the fact that a physician has likely been acquainted with more wounds and scars in the course of his or her training than the average patient and thus has a better idea of what a good or bad scar may look like. The patient, however, judges scars

from his or her own personal, subjective point of view. This is also useful information, as this can help doctors to continue to work in a patient-oriented manner in the future and to improve their work.

5.1. Limitationen (Limitations)

Several limitations are notable. A limitation of our study is the small group size, which prohibits generalization of the results. However, this study was limited to only one clinic and 27 months, which explains the small number of patients. This is one of few studies in Germany that investigates quality of life and scar quality using validated survey instruments to collect patient-reported outcomes. Furthermore, the preoperative data, as well as the postoperative data, were collected after surgery. This means that the patients filled in the preoperative questionnaire from memory, which limits the conclusions that can be made. Another limitation of our study is that patients were not separated into subcategories for primary augmentation, secondary augmentation, or augmentation combined with mastopexy. Consequently, all of the patients in these categories were included in our study. Furthermore, this study is monocentric and took place in one hospital, so there cannot be a generalization of the results. However, when comparing the results to larger and polycentric studies, the results are similar. Finally, the number of patients who filled out the preoperative survey was less than the number that filled out the follow-up survey.

5.2. Konklusionen (Conclusions)

In this study, using the BREAST-Q survey system, we discovered that aesthetic breast augmentation with nanotextured silicone-filled breast implants significantly improves women’s body satisfaction and psychosocial well-being. Furthermore, using the POSAS survey tool, it was shown that the more time that has passed after the surgery, the better scars were assessed by patients and physicians, and that scars were assessed as good overall. These findings indicate the effectiveness of breast implants in improving a woman’s quality of life.

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7. Anhang

7.1. Abbildungsverzeichnis (List of diagrams)

7.2. Tabellenverzeichnis (List of tables)