

Female-to-Male Chest Surgery in Transgender Patients: A Comparison Between 2 Different Techniques and a Satisfaction Study in a Single Center

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Abstract

Background: Gender dysphoria is a distress caused by a mismatch between gender identity and the sex assigned at birth. About 0.5% of the population suffer from gender dysphoria, which represents 25 million people worldwide. Gender-affirming mastectomy is the most common procedure for female-to-male patients.

Objectives: The aim of this single-center retrospective study is to present the outcomes after mastectomy and to evaluate patient satisfaction using the BODY-Q questionnaire.

Methods: Several data regarding patient characteristics and surgery have been collected. A satisfaction survey has been sent to patients. Two groups, “NAC grafts” and “semicircular,” have been compared for complications and satisfaction.

Results: A total of 103 patients have had a transgender mastectomy performed by 3 surgeons, representing 206 mastectomies. There were 5 wound infections (4.8%), 8 seromas (6.8%), 10 hematomas (6.8%), and 23 partial/total nipple areolar complex (NAC) necrosis (20.4%). The complication rates in this study are similar to others in the literature. Few studies express interest in patient satisfaction after this type of surgery and even fewer use a suitable questionnaire.

Conclusions: Transgender mastectomy is a safe and often necessary procedure to improve the quality of life of patients suffering from gender dysphoria. Nevertheless, there is currently no validated tool to assess postoperative satisfaction within this specific population group.

Level of Evidence: 3

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Gender dysphoria refers to a clinically significant distress or a functional impairment resulting from a mismatch between gender identity and the sex assigned at birth.¹ These patients experience significant suffering and generally have a strong desire to undergo hormonal and/or surgical procedures to match their gender identity. It is estimated that 0.5% of the population experiences some form of gender dysphoria, representing approximately 25 million individuals worldwide.²

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Gender confirmation mastectomy is the most frequently requested procedure and, in many cases, the only 1 among female-to-male (FtM) patients seeking to masculinize their body.³ This surgery involves a resection of the mammary gland and, when deemed necessary, of excessive skin, depending on breast volume and ptosis, while minimizing scarring. Additionally, it is often necessary to resize and reposition the nipple areolar complex (NAC).⁴ Various techniques exist, depending on the patient's anatomy, such as semicircular mastectomy, transareolar mastectomy, concentric circular mastectomy, and free nipple graft mastectomy.⁵

In recent years, our institution (Liège University Hospital) has become a reference center for transgender surgeries, in which mastectomies, breast augmentations, and facial feminizations are performed.^{6,7} Since 2019, medical consultations for transgender children have been developed. Currently, there are limited data in the literature assessing the satisfaction of patients who have undergone transgender mastectomy. Moreover, there is no specific tool for evaluating the postoperative satisfaction of this population group.⁸ The primary objective of this monocentric retrospective study is to highlight postoperative complications following gender-affirming mastectomies and to assess patient satisfaction using the BODY-Q satisfaction questionnaire.⁹

METHODS

After approval from the Liège University ethics committee (EudraCT: B7072023000046), we queried the hospital records at the Liège University Hospital between January 2019 and April 2023. Inclusion criteria were patients with no age restriction who underwent an FtM transgender mastectomy, a "semicircular" mastectomy or mastectomy with "NAC grafts," with at least 3 months of follow-up. We found 103 patients matching the inclusion criteria. One patient was excluded from the study because he was the only one to benefit from an inverted-T mastectomy, which is not a standard procedure.

The following data were collected from the patients' medical records: age, weight, height, BMI, medical and surgical history, medication, smoking status, psychologist's approval, operative date, type of procedure, surgeon, mastectomy weight, postoperative complications (infections, seromas, hematomas, necrosis of NAC, revision surgery), and need for corrective surgery.

Patients were contacted by phone by 2 doctors in August 2023 to obtain their email addresses. After obtaining informed consent, the BODY-Q (French version), including 4 modules of interests (satisfaction regarding chest, nipples, scars, and the surgeon), was sent to each patient as a Google Form. The BODY-Q questionnaire was

selected over the BREAST-Q one because of the relevance of its questions, which could not be adequately addressed by the BREAST-Q questionnaire. The patients were asked to respond to 36 questions (eg, "In the past few weeks, how much have you been bothered by the location of your scars?") by assigning a value from 1 (extremely bothered/definitely disagree) to 4 (very satisfied/definitely agree) to each of them. A satisfaction score was then calculated. The minimum time between the surgery and the BODY-Q answers was 3 months.

The results in terms of postoperative complications and satisfaction were then compared between the 2 operative techniques: semicircular mastectomy and free nipple graft mastectomy.

Surgical Technique

The choice of the technique (semicircular mastectomy or mastectomy with NAC grafts) was left to the surgeon's discretion based on the breast volume and skin excess.

Semicircular mastectomy is proposed for patients with lower breast volume and skin excess. An inferior hemiareolar incision is made, through which the mammary gland is excised. Mastectomy with NAC grafts is proposed for patients with higher breast volume. The NAC is deepidermized and harvested. An elliptic incision excising a skin paddle and the original NAC is made. The mammary gland is excised with this skin paddle. The NAC is then grafted on the desired location. All patients had a drain placed in each breast at the end of the surgical procedures and were required to wear a chest compression garment for a month, day and night. Patients who benefited from the NAC graft technique had a bolster dressing for 5 to 7 days. They all spent 1 night at the hospital (except in case of complications), were discharged the following day after removal of the drain, and were seen in the outpatient clinic at 1 and 2 weeks postoperatively.

Statistical Analysis

Descriptive statistics were calculated as percentages, means, and medians, based on the variable type. A Mann-Whitney test (a nonparametric test) was used to compare variables with nonnormally distributed data. A χ^2 test was used to compare smoking habits between the semicircular and the NAC graft groups.

RESULTS

A total of 103 patients underwent surgery by 3 different surgeons during this period representing 206 mastectomies.

The median age was 22 years (range, 16-45), with a median BMI of 24.11 kg/m². Twenty-nine patients were active

Table 1. Patients' Characteristics Within 2 Groups

	NAC grafts (n = 74)	Semicircular (n = 29)	P-value
Mean age in years (range)	24.8 (16-45)	22.8 (18-42)	.45
Mean BMI in kg/m ² (range)	26.7 (19.3-43.9)	20.6 (17.8-16.9)	<.05
Smoking (%)	16 (21.6%)	13 (44.8%)	<.05
Weight of right mastectomy in gram (range)	498.5 (79.6-1648)	165.4 (46.8-569.9)	<.05
Weight of left mastectomy in gram (range)	490 (52.6-1800)	174.2 (43.8-607)	<.05

NAC, nipple areolar complex.

smokers (28.2%). Eighty-eight patients were undergoing hormonal therapy at the time of the surgery, which represents 85.4% of the cohort.

Seventy-four patients underwent free nipple graft mastectomy, totaling 148 mastectomies (71.9%), whereas the remaining 29 patients underwent semicircular mastectomy, resulting in 58 mastectomies (28.1%). The average weight of the mastectomies from the NAC grafts group was 496.9 g (± 348.2), whereas the average weight of the semicircular group was 189.9 g (± 123.2). Patient characteristics are summarized in [Table 1](#).

A Mann–Whitney test was conducted to assess group comparability. It was found that in the NAC grafts group, the BMI was significantly higher (26.7 vs 20.6 kg/m²; $P < .05$), as were the resection weights ($P < .05$). The age was also higher in this group, but the difference was not statistically significant ($P = .45$). A χ^2 test demonstrated that the proportion of smokers was significantly higher in the semicircular group ($P < .05$).

Complications

Among the 206 mastectomies, there were 5 wound infections (representing 5 patients out of 103, 4.8%) that were treated with oral antibiotics. There were 8 seromas (representing 7 patients out of 103, 6.8%) managed by needle puncture. There were 10 hematomas (representing 7 patients out of 103, 6.8%), 3 of which required surgical drainage, whereas the remaining 7 were managed by needle aspiration in the following weeks. There were 28 cases of NAC necrosis (partial or total; representing 21 patients out of 103, 20.4%), and 4 patients underwent surgical revision (3.8%), including the drainage of the 3 hematomas and 1 NAC excision. Any form of complication occurred in 33 patients, which represents 32% of the patients included in the

Table 2. Complications Within 2 Groups

	NAC grafts (n = 148)	Semicircular (n = 58)	P-value
Hematoma	6 (4.1%)	4 (6.9%)	.693
Seroma	7 (4.7%)	1 (1.7%)	.402
Infection	4 (2.7%)	1 (1.7%)	.692
NAC necrosis	23 (15.5%)	5 (8.6%)	<.05
Revision surgery	1 (0.7%)	3 (5.2%)	.185

NAC, nipple areolar complex.

study. The above-mentioned postoperative complications are presented in [Table 2](#).

A comparison of complications was carried out between the 2 groups, which did not reveal any significant differences in terms of infection ($P = .692$), hematoma ($P = .693$), and seroma ($P = .402$). There was also no significant difference in revision surgery between the 2 groups ($P = .185$).

However, a significant difference ($P = .028$) was observed in the occurrence of NAC necrosis (partial/total), which was more frequent in the semicircular group. An overall comparison of postoperative complications was also conducted, which showed no significant difference between the 2 groups ($P = .175$).

Survey

The French version of the BODY-Q questionnaire was used to evaluate postoperative satisfaction, covering modules related to the chest, nipples, scars, and surgeon satisfaction.

A total of 87 patients were contacted through email to complete the questionnaire. We received 48 responses, accounting for 46.6% of the 103 patients included in the study and 55.2% of the 87 patients contacted through email. Three of the 48 responses were incomplete and thus excluded. The response rate for the NAC grafts group was 50% (37 responders out of 74 patients) and 27.6% (8 responders out of 29 patients) for the semicircular group. The median time between surgery and questionnaire completion was 10 months (32 months for the semicircular group and 8 months for the NAC grafts group, $P < .05$).

The average satisfaction scores for the chest, scars, NAC, and surgeon were 72.7%, 71.5%, 64%, and 84.5%, respectively. [Tables 3](#) and [4](#) detail patient scores for the 4 modules of the BODY-Q. Patients expressed the highest satisfaction score with their surgeon, whereas the lowest satisfaction score concerned their nipple appearances. The patients were not only least satisfied with the amount of time the surgeon spent with them but were also less satisfied with the shape of the NAC.

Table 3. BODY-Q Scores (Equivalent Rasch Transformed Score) for Patients in the NAC Grafts Group

Patient's no.	BODY-Q scores "chest"	BODY-Q scores "scars"	BODY-Q scores "nipples"	BODY-Q scores "surgeon"
4	64	83	100	100
10	44	63	21	54
19	73	90	68	73
20	100	83	62	86
24	46	90	45	48
27	49	74	45	100
30	61	100	62	92
42	100	100	100	100
43	87	50	68	100
44	87	53	56	92
45	79	59	62	92
46	51	53	21	100
57	46	63	62	46
58	73	74	82	77
61	61	43	50	100
62	67	74	45	100
63	100	78	82	100
67	79	83	90	100
69	83	74	100	66
70	83	68	50	86
74	70	65	56	56
75	87	50	100	100
76	79	74	62	86
77	9	78	68	100
78	100	63	56	92
79	100	83	68	86
80	33	30	41	44
83	79	83	68	100
84	87	90	90	81
87	64	45	75	92
90	76	55	41	100
92	83	57	100	100
93	93	90	62	77
96	49	83	32	77

Table 3. Continued

Patient's no.	BODY-Q scores "chest"	BODY-Q scores "scars"	BODY-Q scores "nipples"	BODY-Q scores "surgeon"
97	64	50	68	81
98	79	53	50	92
102	100	74	100	100

Satisfaction was also compared between the 2 groups. Overall, the satisfaction was similar but slightly lower for the NAC grafts group (73.7%) than for the semicircular group (74.5%). Patients who underwent mastectomy with NAC grafts were less satisfied with their scars and their NAC.

DISCUSSION

The most common postoperative complication following mastectomy is hematoma.¹⁰ In our study, the hematoma rate was 4.9%, which is in line with the literature.^{11,12} Agarwal et al reported a hematoma rate of 5%, whereas Donato et al observed a rate of 14% and Rifkin et al reported a rate ranging from 3.1% to 5.6%.¹⁰⁻¹² In their study, Gallagher et al showed a reduction in hematoma rates in mastectomies with NAC grafts to 0.3% using progressive tension sutures.¹³

Four patients required urgent revision surgery (3.8%), and this rate was consistent with the literature rates, which ranged from 3.2% to 8.8%.^{11,13-16} In their study, Gallagher et al showed an advantage in the use of the progressive tension suture technique to reduce the need for urgent revision.¹³

Partial or total NAC necrosis was observed in 21 patients (20.4%). Interestingly, necrosis was more frequent ($P = .028$) in the semicircular group, which might seem inconsistent. This can be explained by the heterogeneity of our 2 groups, because active smoking was more prevalent in the semicircular group, with 13 patients actively smoking (44.8%) compared with only 16 patients in the NAC grafts group (21.6%). The difference was statistically significant ($P < .05$). Numerous studies have shown the negative impact of smoking on NAC survival.¹⁷

A comparison of postoperative complications was also performed, which showed no significant difference between the 2 groups ($P = .175$). In a study, Kamali et al demonstrated the superiority of the NAC graft technique in terms of fewer complications compared with other techniques.¹⁴ This trend was only observed in our study of NAC necrosis.

Satisfaction

Currently, there is no consensus on which questionnaire to use to assess postoperative satisfaction in transgender

Table 4. BODY-Q Scores (Equivalent Rasch Transformed Score) for Patients in the Semicircular Group

Patient's number	BODY-Q scores "chest"	BODY-Q scores "scars"	BODY-Q scores "nipples"	BODY-Q scores "surgeon"
1	100	100	100	100
6	73	90	90	81
12	59	83	45	61
13	83	78	45	58
31	64	90	50	58
33	70	50	50	66
50	31	43	50	58
94	70	100	62	73

patients. No specific questionnaire regarding this population group exists. Some studies use the BREAST-Q,^{12,18} whereas others use the BODY-Q questionnaire or even their own 4- to 5-point questionnaires.³ This makes comparing the results of the different studies more challenging.

In a study, Agarwal et al¹² used the BREAST-Q, focusing on breast satisfaction, psychosocial well-being, sexual well-being, and physical well-being modules. The authors showed a significant difference in preoperative and postoperative satisfaction for these 4 items. Nonetheless, none of these modules address surgery or patient care. Furthermore, when analyzing the questions in the "satisfaction with breasts" module, some questions may be irrelevant for transgender patients, such as "How satisfied or dissatisfied have you been with how comfortably your bras fit?".

Another questionnaire, the TRANS-Q, which seems promising, has also been developed and validated by Wanta et al.¹⁹ It shows an improvement in postoperative scores. However, some questions are repeated multiple times in the postoperative questionnaire section. In addition, there is no information on how to compare preoperative and postoperative scores, because there are more questions in the postoperative form.

Our overall satisfaction rate stands at 73.2%, indicating that patients are generally satisfied with the surgery. However, this number does not clarify whether there is an improvement compared with their preoperative condition. Numerous studies tackled this subject and highlighted the positive impact of mastectomy on patients' body image.²⁰ Notably, a 2021 meta-analysis by Bustos et al reported an impressive overall satisfaction rate of 92% following chest surgery.²¹ This surpassed our satisfaction rate, which could be attributed to our use of a validated questionnaire, although most of the studies in this meta-analysis relied on nonvalidated and different questionnaires. Another

contributing factor could be that most patients in our survey had recently undergone surgery. To obtain more reliable results, it would probably be necessary to administer the questionnaire at key intervals for each patient, such as at 6 months and 1 year or more postsurgery. Additionally, we observed that unsatisfied patients may not actively seek corrective surgery, and those considering secondary procedures tended to be relatively satisfied before the second intervention.

Satisfaction regarding nipple-related aspects received the lowest scores, aligning with the results of Bertrand et al's research.⁹

Furthermore, studies indicate varying satisfaction levels depending on the type of mastectomy, with transverse mastectomy with NAC grafts showing a lower satisfaction rate (90%) compared with the semicircular approach.²¹ Our study mirrors this trend, with a 73.7% satisfaction rate for the NAC grafts group and 74.5% for the semicircular group. However, this slight difference is not statistically significant. Notably, most questionnaire respondents in our cohort had undergone mastectomy with NAC grafts (37 patients in the NAC grafts group compared with 8 patients in the semicircular group), which may help explain the lower satisfaction score in our study compared with that in the literature.

The questionnaires were completed at different times for each patient, with a median gap of 10 months between surgery and responses. There was a significant difference between the 2 groups (32 months in the semicircular group and 8 months in the NAC grafts group). This difference could potentially influence satisfaction levels. For example, if a patient has had additional corrective surgeries since the mastectomy at the time of the questionnaire, his satisfaction level could be higher than an other patient who only has undergone the mastectomy and not yet corrective surgeries.

One of our study's limitations is that the form could not be completed before surgery, and there is no comparison between preoperative and postoperative results; thus, we are unable to assess the surgery's impact on patients' well-being. Another limitation is that patients completed the survey at different postoperative times. Thus, some of them might have had additional surgeries that can affect their satisfaction scores.

Given the growing number of transgender surgeries worldwide,²² it is essential to develop a specific questionnaire for this population group. As mentioned earlier, each study uses a different questionnaire, making it impossible to compare results between different centers. Ideally, this questionnaire should be administered before and after the surgery at key intervals. Questions such as "Do you regret this surgery?" or "Would you recommend this procedure to someone in a similar situation as you?" could be included in this new questionnaire.

The GENDER-Q is currently in Phase 2 and has already been tested in over 4000 candidates since July 2023. It will focus on the chest and NAC grafts and will include questions related to self-image, appearance, physical, sexual, and psychosocial function.⁸

CONCLUSIONS

Transgender mastectomy is a safe and often necessary procedure to improve the quality of life of patients suffering from gender dysphoria. Nevertheless, there is currently no validated tool available to assess postoperative satisfaction within this specific population group.

Disclosures

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