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Aesthetic Breast Surgery

Feminizing Gender Affirming Breast Surgery: Procedural Outcomes at a Single Academic Institution

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Abstract

Background: Implant-based breast augmentation is a gold standard procedure for transfeminine patients to create a more feminine-appearing chest. In many cases, ancillary procedures are performed simultaneously to achieve an optimal aesthetic result.

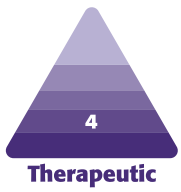
Objectives: To determine the clinical outcomes of patients undergoing feminizing gender-affirming breast surgery in a single academic institution.

Methods: A retrospective electronic chart review of feminizing gender-affirming breast surgery patients at Mayo Clinic, Rochester, from 2017 to 2022 was conducted. Patients' demographics and surgical outcomes were gathered. A survival analysis was performed to obtain the time-to-event complication rate.

Results: Over 5 years, 46 patients (92 breasts) were included. The mean age was 39 years (standard deviation [SD] ±15), and most had an above-normal body mass index (BMI) (58.7%). Thirty (65%) had previous gender-affirming surgeries. The mean implant volume was 289 mL (SD ±95; 140-520). Most implants were placed in a subglandular plane (81%) with an inframammary fold incision (91.3%). All implants used were smooth, round cohesive silicone gel implants. Ancillary procedures were performed in 32 patients (69.57%). Eight patients presented complications (4 major vs 4 minor) in a median postoperative follow-up of 372 vs 392 days; at 1-month follow-up, the probability of a complication having occurred is 2.17% (95% CI: 0%-6.3%) vs 5% (95% CI: 0%-11.5%), and at 1 year, the probability is 10.21% (95% CI: 0%-20.9%) vs 12.5% (95% CI: 0%-23.4%), which remains the same up to 4 years.

Conclusions: Breast augmentation with implants is a safe procedure to achieve feminization of the breast with a low rate of complications.

Level of Evidence: 4



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According to The Diagnostic and Statistical Manual of Mental Disorders, fifth edition, gender dysphoria is the distress experienced because of the incongruence between one's gender identity and one's birth-assigned gender.[1] It is important to note that gender nonconformity to stereotypical gender role behavior itself, as an expression of the broad spectrum of gender diversity, is not a disorder unless it is associated with clinically significant distress and impairment.[2] Treatment requires a multidisciplinary approach, with options involving hormone therapy (HT) and gender-affirming surgeries (GASs).[3]

As per the latest guidelines, it is the best practice to use the term proportions instead of incidence and prevalence when referring to the transgender and gender-diverse (TGD) population to avoid pathologizing.[4,5] In the United States, the latest proportion of TGD in health system–based studies ranged from 0.02% to 0.08%,[6-10] whereas in the survey-based studies, self-reported transgender people ranged from 0.3% to 0.5%. Outside the United States, survey-based studies enquiring about gender diversity, including gender incongruence or ambivalence, reported higher proportions ranging from 0.5% to 4.5%.[11-13] The amount of TGD that seeks gender-affirming treatment because of gender dysphoria has been reported to be less than 0.1%; however, this is likely to be underestimated.[2]

Since 2015, the Transgender and Intersex Specialty Care Clinic at our institution has been offering comprehensive multidisciplinary care for TGD patients who seeking care. The program follows the standards of care guidelines set forth by the World Professional Association for Transgender Health (WPATH).[4] To achieve gender congruence, patients are first treated by behavioral health and endocrinology, and other specialties are consulted depending on the needs of the patient. Afterwards, the patients are referred to surgery based on their wishes and goals.

In this study, our focus is to describe our experience with breast feminization surgery, specifically through implant-based mammoplasty. This procedure holds paramount significance in the overall process of feminization, contributing to the development of breasts that align with the aesthetic and gender identity goals of our patients. In certain cases, ancillary procedures, such as mastopexy, liposuction of the axillary area, and reduction of the nipple-areola complex (NAC), are performed simultaneously to achieve an optimal aesthetic result. Additionally, another adjunct procedure, glandular scoring for parenchymal expansion, is utilized to address tuberous breast characteristics that may develop after HT.

METHODS

Study Design and Patient Selection

Following approval from Mayo Clinic Institutional Review Board, a retrospective electronic chart was conducted for patients who underwent primary feminizing chest wall GAS with implants at our institution. The study spanned from November 2017 to June 2022. Revisions feminizing gender-affirming breast surgery or fat grafting alone for breast augmentation were excluded. Demographics including age and BMI at the time of the surgery; race; comorbidities including smoking status, alcohol consumption, hypertension, diabetes mellitus, and dyslipidemia; history of breast surgery, placement of tissue expander placement, chest wall radiation, HT, and duration; and other GAS were recorded. Characteristics of the implant, including volume (mL), model profile, brand, texture, and shape; surgical characteristics, including the plane of implant placement, place and size of incision, operative time, and simultaneous GAS; other intraoperative techniques such as nipple shields, antimicrobial pocket irrigation, preliminary sizers, and Keller funnel (Keller Medical, Inc, Stuart, FL) usage; the administration of anesthesia infiltration and tranexamic acid (TXA); and ancillary procedures such as mastectomy, glandular scoring for parenchymal expansion, liposuction of the axillary area, fat grafting, and NAC reduction during the feminizing gender-affirming breast surgery were recorded. Revision surgery rate, indication, management, and time between the procedures were also collected. The complication rates were reported on a per-breast basis. Postoperative complications included seroma, surgical-site infection (SSI), hematoma, wound dehiscence, capsular contraction with its Baker grade, and malposition, as well as their management and dates. A major complication was defined as a complication that requires surgical intervention in the operative room for its management. A minor complication was defined as a complication that presented at any given time and resolved spontaneously or at the bedside table during the office visit appointment. The last follow-up was defined as the last appointment within the Plastic Surgery Division at our institution. The last appointment at other departments or institutions was not considered. The smoking status was classified into 3 subgroups. The first subgroup was active smokers defined as individuals who had smoked at least 1 cigarette per day or had smoked within 30 days prior to the surgery. The second subgroup was former smokers defined as individuals who had smoked more than 100 cigarettes in their lifetime but had not smoked within 30 days prior to the surgery. The third subgroup was never smokers who had either never smoked or had smoked less than 100 cigarettes in their lifetime.

Statistical Analyses

Shapiro–Wilk tests were performed to assess the distribution of the data, and a significance level (α) of 0.05 was established. Descriptive statistics, including medians, first and third interquartile percentages, and ranges, were

used to display the data. The Kaplan–Meier (KM) survival analysis was used to estimate the probability of a complication after surgery, minor or major, occurring over time. KM estimates and a 95% confidence intervals (CI) were calculated for the entire follow-up period. Time to event was defined as time from the feminizing gender-affirming breast surgery until the date of the first complication occurring, for both major and minor. Patients who did not have any complications were censored at their last follow-up appointment within the Plastic Surgery Division at our institution. BlueSky Statistics Software version 7.4, 2021, was used for these analyses.

Surgical Technique Selection

Prior to the surgical procedure, a comprehensive discussion occurs between the medical team and the patient. This conversation encompasses aspects of the surgery, such as incision placement, implant type, and the preferred pocket for implant placement, which are discussed thoroughly. This provides the patient with the opportunity to engage and voice their opinion on their care, it also provides an opportunity for the providers to learn about the patient's goals and expectations and communicate their own advice on what can be delivered.

At our institution, we present the choices for a periareolar and inframammary fold (IMF) incision placement. In terms of the plane of placement, we offer subglandular, subfascial, submuscular, and dual-plane techniques for breast augmentation. In most cases involving transfeminine patients, we opt for the subglandular plane. This choice arises from our observations, many of our transfeminine patients, particularly those who transitioned later in life, exhibit prominent pectoral muscles. To mitigate the potential for implant malposition or animation deformities, we veer away from employing a partial or complete submuscular technique.

Regarding implant selection, we provide options between a round saline-filled implant and a round silicone-based implant. The latter offers a variety of gel viscosity options. Most of our patients opt for highly cohesive round silicone-based implants. The final decision is collaboratively reached, taking into consideration the patient's preferences and informed guidance from the provider, considering factors such as the amount of subcutaneous tissue, skin elasticity, and skin quality.

Depending on individual patient characteristics, we may perform additional techniques to achieve a more feminine and overall natural look. These techniques may include mastopexy, glandular tissue scoring, and IMF readjustment, among others, to contribute to the desired outcomes and aesthetic refinement.

At the time of the surgery, perioperative antibiotic prophylaxis involved the intravenous administration of 1 g of first-generation cephalosporin at least 30 min before incision. In cases of penicillin allergy, clindamycin 600 mg IV was administered instead of cephalosporin. Following routine skin preparation of the chest wall and nipple-areola area with povidone-iodine soap, the nipples were covered with Tegaderm (3M, St Paul, MN) transparent dressings, functioning as nipple shields during the augmentation procedure. Throughout the augmentation, the breast pocket underwent irrigation with a triple antibiotic solution, followed by dilute betadine before implant placement. The preliminary use of sizers was employed to determine the optimal size and address aesthetic considerations. Breast implants were inserted using a Keller Funnel for a no-touch technique. Toward the end of the procedure, anesthesia infiltration was applied in the breast pocket to aid in postoperative pain control. Upon completion, the nipple shields were subsequently removed. Five attending surgeons performed the procedures.

RESULTS

A total of 46 patients (92 breasts) underwent gender-affirming breast augmentation surgery over 5 years and were included in this study. All patients identified as females, the mean age was 39 years old (SD ±15; 18.984–73.958), 36 patients (78%) identified as white, 3 (7%) as Asian, 2 (4%) as African American, 1 (2%) as American Indian. Nineteen (41%) patients had a normal BMI (18.5-24.9) at the time of the surgery, 10 (22%) were overweight (25.0-29.9), and 17 (33%) were obese, with 12 (23%) falling into Class I (30.0-34.9), and 5 (11%) into Class II (≥35.0). Forty-four (77%) did not have a smoking history; 25 (54%) reported alcohol consumption; 5 (5%) had hypertension; 12 (26%) presented dyslipidemia; and 2 (4%) had diabetes. All patients had HT prior to surgery. Thirty (65%) had previous GASs: 19 (41%) had vaginoplasty, 10 (22%) had facial feminization surgery, and 1 (2%) had tracheal shaving. Overall, 3 patients (7%) had simultaneous gender-affirming procedures of which 2 (67%) had vaginoplasty and 1 (33%) had a tracheal shave (Table 1).

The surgeries within this patient cohort were performed by a total of 5 surgeons. All patients underwent implant-based breast augmentation with a mean implant volume of 289 mL (SD ±95; 140-520; $P < .05$). All implants were smooth in texture and round shaped. The planes for implant placement were 74 breasts (82%) subglandular, 16 (17.39%) subfascial (Figure 1), and 2 (2%) subpectoral via. Eighty-four breasts (91.3%) got an IMF incision and 8 (8.7%) had a periareolar incision. The mean length of the IMF incision was 5.3 cm (SD ± 1; 4-7). Median operative time was 63 min (IQ1-IQ3: 50-103; Table 2).

Intraoperative techniques, such as nipple shields, antimicrobial pocket irrigation, preliminary use of sizers, implant

Table 1. Summary of Patients Characteristics

Characteristic	*n* (%)
Transfemale gender identity	46 (100%)
Age, median (range)	33.7 (19-74)
Race	
African American	2 (4.3%)
American Indian/Alaskan	1 (2.2%)
Asian	3 (6.5%)
White	36 (78.3%)
Other	3 (6.5%)
Unknown	1 (2.2%)
Body mass index, kg/m^2	
Normal: 18.5-24.9	19 (41.3%)
Overweight: 25-29.9	10 (21.7%)
Obese Class I: 30-34.9	12 (26.1%)
Obese Class II: 35-39.9	5 (10.9%)
Alcohol use	25 (54.3%)
Current smoker	2 (4.3%)
Former smoker	21 (45.7%)
Drugs	10 (21.7%)
Hypertension	5 (10.9%)
Dyslipidemia	12 (26.1%)
Diabetes	2 (4.3%)
Operative time, median (IQ1-IQ3)	63 (50-98)
Intraoperative TXA	29 (65.9%)
Previous gender-affirming surgeries	
Vaginoplasty	19 (41.3%)
Facial feminization	10 (21.7%)
Tracheal shaving	1 (2.2%)
Prior hormone therapy	46 (100%)
Simultaneous gender-affirming procedure	
Vaginoplasty	2 (4%)
Tracheal shave	1 (2%)

TXA, tranexamic acid.

insertion through Keller Funnel, and anesthesia infiltration, were used in all patients. TXA was administered to improve hemostasis in 29 patients (65.9%). Ancillary procedures were performed in 40 breasts: 30 (32.61%) had scoring of the mammary gland for parenchymal expansion and tuberous breast feature correction, 6 (6.52%) had mastopexy, 2 (2%) had NAC reduction, and 2 (2%) had liposuction, for a total of 32 patients (69.57%; Figure 2). None required a staging procedure using a tissue expander or fat grafting.

The Shapiro–Wilk test showed a significant departure from normality for various variables. The duration of HT before feminizing gender-affirming breast surgery demonstrated nonnormal distribution (W [93] = 0.57, $P < .001$), with a median of 2.4 years (IQ1: 1.6 to IQ3: 3.4). Similarly, age at the time of the surgery (W [92] = 0.91, $P < .001$) with a median of 33.7 years (IQ1: 27.1 to IQ3: 50.7); BMI at the time of the surgery (W [92] = 0.94, $P < .001$, median 26.8 kg/m^2, IQ1: 22.65 to IQ3: 32.3); implant volume (W [92] = 0.9, $P < .001$, median 262.5 mL, IQ1: 210 to IQ3: 305); operative time (W [90] = 0.85, $P < .001$, median 63 min, IQ1: 50 to IQ3: 98), and follow-up time (W [92] = 0.88, $P < .001$, median of 13 months, IQ1: 4 to IQ3: 24).

The survival analysis for major complications showed a median postoperative follow-up of 372 days (Table 3). Among the cohort, 4 patients (8.7%) presented complications requiring surgical intervention. These complications included 2 cases (2.17%) of unilateral hematomas; 1 instance (2.17%) of bilateral implant malposition managed through capsulotomy, acellular dermal matrix placement, and implant exchange; and 1 case (2.17%) of bilateral capsular contracture managed with capsulotomy and implant exchange (Table 4). Each reported percentage corresponds to a per-breast basis, reflecting the independent nature of complications within each breast among the study participants. In the case of the patient with bilateral implant malposition, the implants exhibited medial displacement, and a thin capsule precluded the option of capsulorrhaphy. Consequently, a 16×20 piece of AlloDerm (AbbVie, North Chicago, IL) was utilized on each side to address this limitation. Lateral capsulotomies on both sides were conducted to enhance symmetry and correct nipple lateral gazing.

At 1 month follow-up, the probability of a complication occurring is 2.17% (95% CI of 0%-6.3%). At 1 year follow-up, the probability of a complication occurring is 10.21% (95% CI of 0%-20.9%; Figure 3). The survival analysis for minor complications showed a median postoperative follow-up of 392 days, present in only 4 patients (8.7%): $n = 1$ mild palpable fluid under the right nipple (2.17%), $n = 1$ unilateral mild rippling in the medial aspect of the breast (2.17%), $n = 1$ bilateral SSI resolved in less than 2 weeks (2.17%), and $n = 1$ unilateral full thickness wound dehiscence (2.17%; Table 5). A total of 3 patients (6.5%) underwent further revision: from which 1 was nonsurgical for hypertrophic scar management with fractional laser and corticosteroid injection (2.17%); and 2 surgical revisions for volume augmentation with implant exchange (4.35%): 1 from 345 to 700 cc and the other from 235 to 330 cc (Table 6).

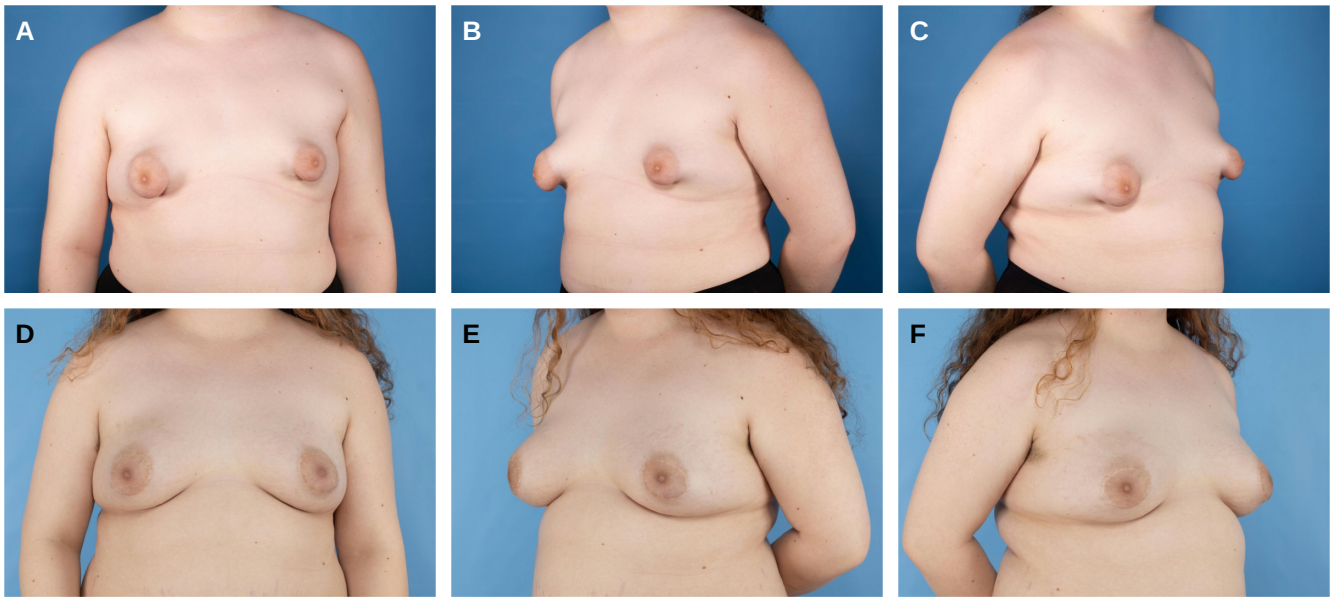

Figure 1. A 21-year-old transfemale patient undergoing implant-based breast augmentation with Mentor MemoryGel 300 cc (Johnson & Johnson, New Brunswick, NJ) moderate plus profile, periareolar incision, and subglandular plane + bilateral mastopexy and glandular scoring. (A) Preoperative image, anterior view. (B) Preoperative image, left anterior-oblique view. (C) Preoperative image, right anterior-oblique view. (D) Postoperative image at the 19-month follow-up, anterior view. (E) Postoperative image at the 19-month follow-up, left anterior-oblique view. (F) Postoperative image at the 19-month follow-up, right anterior-oblique view.

DISCUSSION

Standards of care defined by WPATH recommend a minimum of 1 year of hormonal therapy prior to breast feminization surgery[4] to optimize patients' breast development. Although HT may result in some degree of breast development,[14] as seen in our patients, it rarely reaches Full Tanner stage V,[15] insufficiently alleviating chest dysphoria.[16] Consequently, individuals seek gender-affirming breast augmentation to achieve a chest more closely resembling a cis-female breast,[17] or in other words, feminize the chest wall.

In 2021, a set of consensus recommendations and guidelines was issued regarding the perioperative management of long-term medications for surgical procedures.[18] Pertinently, regarding feminizing HT, the guidance advises its continuation both before and on the day of surgery. However, this decision is made with a careful consideration of the potential increased risk of venous thromboembolism (VTE) if the therapy is continued. The controversy because of this potential risk has prompted recommendations to discontinue HT 2 weeks prior to surgery and resumed it 3 weeks postoperatively.[15] More recent findings indicate that TGD individuals undergoing surgery and maintained on feminizing HT throughout do not exhibit a perioperative increase in the rate of VTE, in contrast to those patients whose sex steroid treatment was ceased before the operation.[4,19,20]

In our clinical practice, we adopt an individualized approach to patient assessment. Only if a patient exhibits any risk factors for VTE, we consider discontinuing therapy. If deemed necessary, this cessation occurs 2 weeks prior to the scheduled surgery. This personalized approach aligns with the overarching guidelines while tailoring the management plan to the specific needs and risks of each patient. None of our patients experienced this complication throughout the follow-up period, despite all having initiated HT at least 1 year and 1 month before undergoing feminizing gender-affirming breast surgery.

The anatomic differences in the transfemale, because of the exposure of testosterone during adolescence and exogenous estrogen during transition,[21] must be considered at the time of choosing a surgical approach in various aspects, such as placement plane, incision site, size of implant, and additional procedures. It has been reported that a typical transfemale patient has a high BMI and a wider chest[21-24]; therefore, in these cases, it is sensible to select a larger implant in volume and base width to accommodate the chest dimensions in order to achieve aesthetically optimum results with a medial cleavage and adequate lateral fullness.[21-25] We report that 56% of patients with a higher than normal BMI, and for implants characteristics, we report a 280 mL mean volume. Nonetheless, it is important to keep in mind and discuss with the patient that further increase in volume may happen after surgery,[21] because of the HT. These are broad

Table 2. Characteristics of Implants and Ancillary Procedures

Variable	*n* = 92
Implant volume, median (IQ1-IQ3)	262.5 (210-305)
Plane, %	
Subglandular	74 (80.43%)
Subfascial	16 (17.39%)
Subpectoral	2 (2.17%)
Incision, %	
IMF	84 (91.30%)
Periareolar	8 (8.70%)
IMF incision, median (IQ1-IQ3)	5 (4-5)
Implant brand, model (profile), %	
Natrelle INSPIRA cohesive, Allergan, Inc.	60 (65.22%)
SCL (low profile)	4 (4.35%)
SCLP (low plus profile)	22 (23.91%)
SCM (moderate profile)	24 (26.09%)
SCF (full profile)	8 (8.70%)
SCX (extra full profile)	2 (2.17%)
Natrelle INSPIRA SoftTouch, Allergan, Inc.	4 (4.35%)
SSL (low profile)	2 (2.17%)
SSM (moderate profile)	2 (2.17%)
MENTOR MemoryGel, Johnson & Johnson	24 (26.09%)
Moderate profile	6 (6.52%)
Moderate plus profile	10 (10.87%)
Not reported	8 (8.70%)
Sientra, Inc., low profile	2 (2.17%)
Not reported	2 (2.17%)
Ancillary procedures	40 (43.48%)
Mastopexy	6 (6.52%)
Liposuction	2 (2.17%)
Glandular scoring for parenchymal expansion	30 (32.61%)
NAC reduction	2 (2.17%)

IMF, inframammary fold; NAC, nipple-areola complex. Natrelle INSPIRA Cohesive models are: SCL, smooth low profile; SCLP, smooth low-plus profile; SCM, smooth moderate profile; SCF, smooth full profile; SCX, smooth extra-full profile. Natrelle INSPIRA SoftTouch models are: SSL, smooth low profile, and SSM, smooth moderate profile.

considerations for the majority of patients; however, it is important to personalize the approach for each individual. A prevalent trend observed in our study was a higher inclination toward moderate profile (33.4%) and low plus profile (26.2%) implants within the Allergan Natrelle INSPIRA series (Allergan, Dublin, Ireland). Additionally, a considerable preference was noted for moderate profile (7.1%) and moderate plus profile (11.9%) implants from the MENTOR MemoryGel (Johnson & Johnson, New Brunswick, NJ). As mentioned previously, there are different placement planes for breast implant. Fakin et al proposed an algorithm for implant pocket choice in which if the soft-tissue pinch test is less than 1.5 cm, a dual plane should be chosen.[26] However, because of the greater muscle mass, the submuscular plane represents a risk for postoperative animation deformity and implant malposition.[15,27] Therefore, some surgeons and authors advocate for subglandular placement,[28] as in most of our patients (80.4%) in this study. While some evidence suggest that the submusuclar plane pocket is often considered the most optimal choice[29] rather than subglandular due to diminished subcutaneous tissue post-HT,[21,23] it's noteworthy that complication rates associated with this approach have been higher than those observed in our study. Some patients might experience nipple areola complex enlargement after HT, for which a periareolar approach would be most beneficial[21] as in the 8.7% of our patients. Nonetheless, the majority of transfemale patients present with a smaller NAC and a shorter distance between the NAC and IMF. This frequently requires repositioning of the IMF to a lower position, making IMF incision the preferred approach[26] for these patients as seen in 91.3% of our sample. Besides, IMF incisions have been reported to have lower risk of capsular contracture and moderate-to-severe implant malposition compared with periareolar and axillary incision.[30] In some patients, because of the aforementioned incomplete breast development, a constricted lower pole and herniated areola are often present.[21] This is managed as a tuberous breast in a cisgender female, with scoring of the gland[31] as in 15.2% of our patients. Because of lateralized NAC with less projection,[21,24] some transfemale patients require circumareolar mastopexy to allow an adequate NAC positioning[32] as seen in 4.4% of our patients.

Breast augmentation has a low complication profile rate, regardless of whether it is performed in cis-female or transfemale patients.[33] In our study, we report a 30-day complication probability of 2% and 5% for major and minor complications, respectively. With similar numbers as ours, research has shown no statistical difference in the all-cause complication rate for posterior breast augmentation between cisgender females and transfemales with 1.6% and 1.8%, respectively. Despite the transgender cohort being older, having more comorbidities, and a higher average BMI, there was no noteworthy difference in 30-day complication rates between transgender and cisgender patients.[34] Other studies report a minor complication rate of 17.6%,[24] a major complication

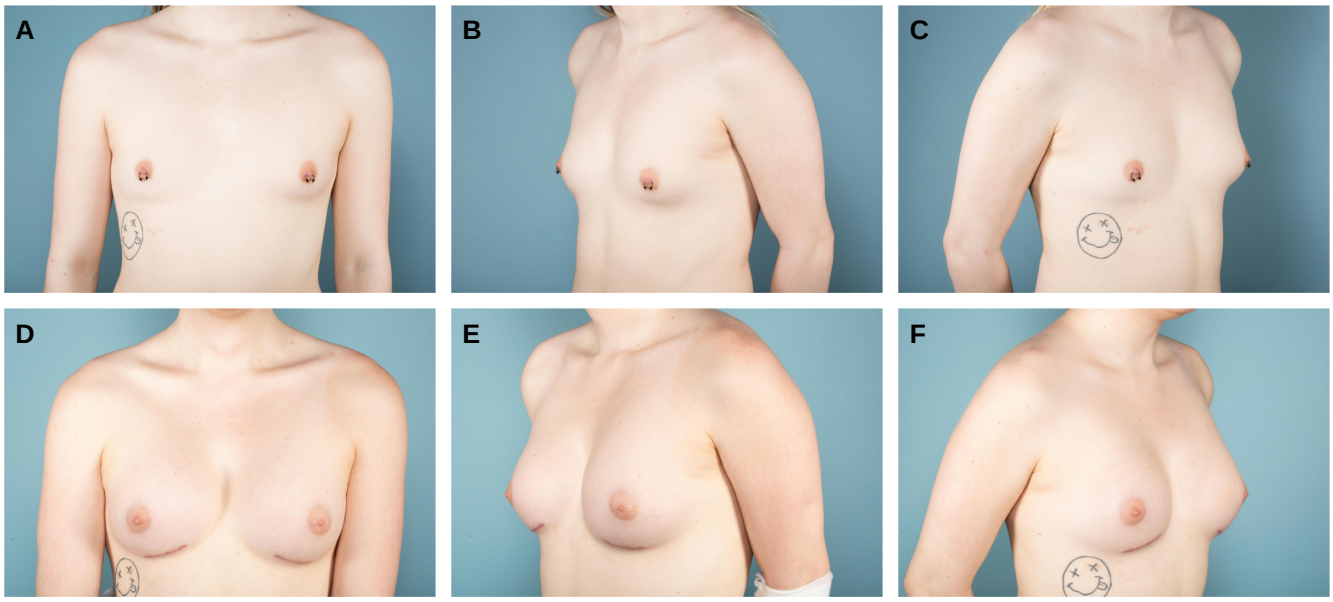

Figure 2. A 24-year-old transfemale patient undergoing implant-based breast augmentation with Natrelle Inspira cohesive SCM 225 cc—(Allergan, Dublin Ireland), IMF incision, and subfascial plane without ancillary procedures. (A) Preoperative image, anterior view. (B) Preoperative image, left anterior-oblique view. (C) Preoperative image, right anterior-oblique view. (D) Postoperative image at the 12-month follow-up, anterior view. (E) Postoperative image at the 12-month follow-up, left anterior-oblique view. (F) Postoperative image at the 12-month follow-up, right anterior-oblique view.

Table 3. Survival Summary: Complications After Surgery

Overall ($n = 46$)	Major complications	Minor complications
Complications	4	4
Median follow-up	372 days	392 days

Table 4. Description of Major Complications

$n = 5$ breasts (5.4%), 4 patients (8.7%)	Major complication	Presentation after surgery (days)	Management
1	Implant malposition: symmastia + NAC lateralization + bottoming out	373	Capsulotomy + ADM + implant exchange
2			
3	Capsular contraction Baker II	362	Capsulotomy + implant exchange
4	Hematoma	1	Hematoma evacuation
5	Hematoma	4	Hematoma evacuation

ADM, acellular dermal matrix; NAC, nipple-areola complex.

rate from 5%[35] to 42.8%.[26] One of the most frequently reported complications is capsular contracture.[17,27,36] It has been reported that risk factors include history of chest wall radiation, subglandular implant placement, and use of smooth and silicone implants, with an incidence of 10.6%.[27,37] Despite these being the characteristics of most of our patients, except for the radiation (0%), we report a very low incidence of 2.17% similar to a study with a cohort of 159 patients with a 3% incidence.[35] A systematic review evidenced a 2.8% vs 8.6% rate of capsular contracture in submuscular vs subglandular planes.[30] Another study with a long follow-up of 15 years found no difference regarding pocket location and capsular contracture.[38] Half of our reported major complications were hematomas that required evacuation (4.35%) and presented up to 4 days postoperatively. In a recent study, one of the largest series of 527 patients with a 30-year follow-up reported 0.4% of hematomas up until Day 11 postoperatively.[39] They also reported 0.8% of SSI that required explantation; however, in our patients, these were minor (8.7%) managed with oral antibiotics.

In our cohort of 46 patients, 3 individuals (6.5%) underwent revision surgery, with 2 specifically seeking volume augmentation (4.35%). The literature reports a high percentage of revision surgery following primary breast augmentation, with rates ranging from 9.4%[40] as high as 36%[41,42] and even 44%[43] in some publications. In the case of the patient who required an adjustment from 345 to 700 cc, the decision was meticulously made, considering anatomical factors, and aligning with the patient's

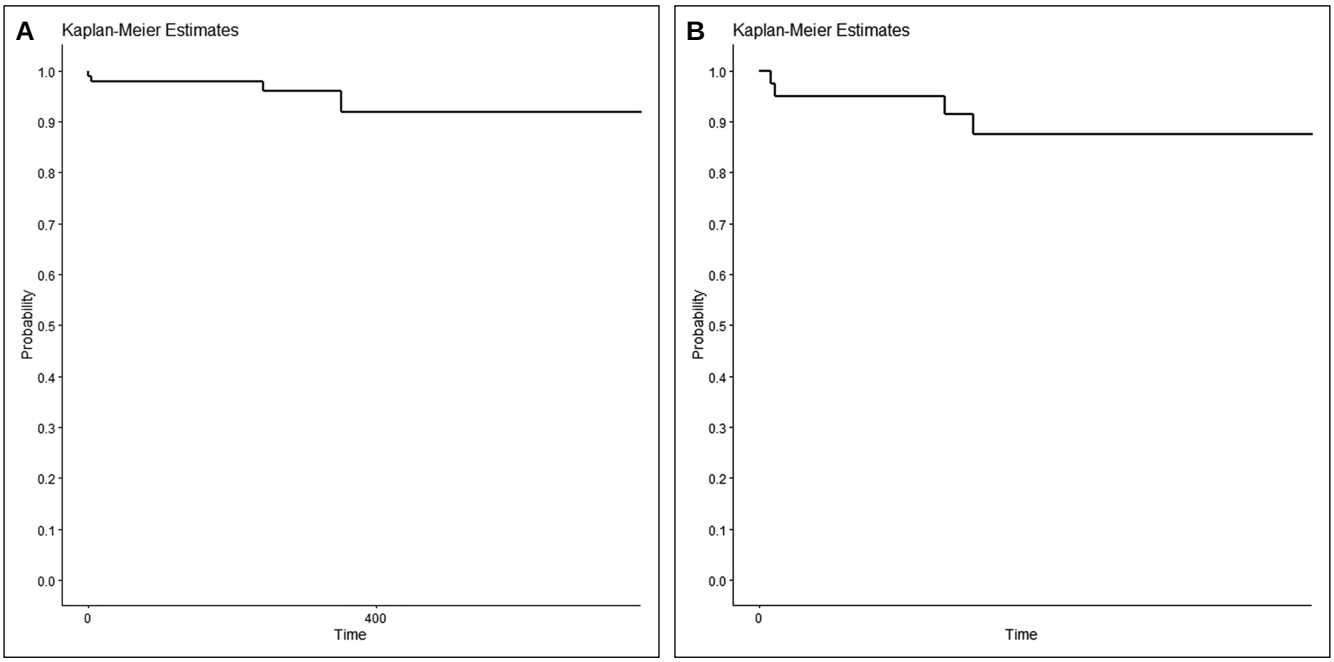

Figure 3. Kaplan–Meier estimates. (A) Major complications after surgery. (B) Minor complications after surgery.

Table 5. Description of Minor Complications

$n = 5$ breasts (5.4%), 4 patients (8.7%)	Minor complication	Presentation after surgery (days)	Management
1	Right nipple mild palpable fluid <5 cc Baker II	17	Compression and reducing arm motion. Recommended NSAIDs, light stretching/massage, and warm compress if needed
2	Very mild rippling on right breast medial aspect + mild discomfort. Patient reports as "bumps"	149	Monitor and notify if pain progress
3	SSI	8	Antibiotics. Resolved in <6 days
4			
5	FT wound dehiscence at the right lateral apex of the incision ~1 cm diameter	11	Triamcinolone cream once daily. Healed in a week.

FT, full thickness; NSAIDs, nonsteroidal antiinflammatory drugs; SSI, surgical-site infection.

goals. Achieving such a substantial volume in the initial stage was not feasible, and this limitation was thoroughly discussed with the patient. In our practice, we prioritize a conservative approach initially, advising patients based on the literature's recommendations regarding the desire for additional volume in later stages. It is important to note that alongside capsular contraction and implant malposition, the request for implant upsize is a common reason for revision surgery, with reported rates ranging from 18% after a median follow-up of 6 months[43] to 20% with a mean follow-up of 2.9 years[40] in cis-females and particularly in transfemale and nonbinary individuals, varies from 2.5%[39] to 52%.[26]

This study has several limitations that should be acknowledged. The outcomes may be influenced by variations in individual surgeons' practices and disparities in patient preferences and motivations for seeking additional surgery. These factors are particularly significant in a nonrandomized study. Additionally, the retrospective nature of the research introduces the potential for observer and selection bias, along with the possibility of underreporting information, as exemplified by the absence of specific details regarding breast implant brand (2.17%) and profile (8.7%). The incidence of capsular contraction is likely linked to the follow-up duration of the study population. We anticipate that over a longer follow-up, this figure would likely rise. Although we consider the median follow-up time of 13 months adequate for our investigation, the possibility of loss to follow-up and patient migration could potentially underestimate the actual rates. Furthermore, this study lacks insights into patients' perceptions of their final outcomes. Addressing this gap in a future study focused on patient-reported outcomes would provide valuable insights into the overall success and satisfaction of the surgical interventions.

Table 6. Description of Revision Cases

n = 6 (breasts), 3 patients (6.5%)	Motive	Revision	Time between procedures (days)	Volumes
1	IMF hypertrophic scar	Kenalog injection (corticosteroid: triamcinolone acetonide)/laser Fraxel	778	NA
2				
3	Insufficient volume	Implant exchange	520	From 345 to 700 cc
4				
5	Insufficient volume	Implant exchange	423	From 235 to 330 cc
6				

IMF, inframammary fold; NA, not applicable.

CONCLUSIONS

Feminizing breast augmentation is a safe procedure with low rates of complications in the acute setting of the 30-day postoperative period with 2.17% for major and 5% for minor; as well as a low rate of complications in the long-term follow-up for up to a year with 10.2% for major and 12.5% for minor. Revision surgery was performed in 6.5% of the patients, which was indicated to increase implant volume. In our institution, most of the breast augmentations were performed using the subglandular plane with an inframammary fold incision. Ancillary procedures might have played a role in decreasing the need for revision surgery, as the aesthetic outcomes were desirable. A larger cohort would be required to establish a prediction model for complications with a longer follow-up. Overall, breast augmentation with implants is a safe procedure to achieve feminization of the breast, and these results should be encouraging to patients who are considering this procedure and to surgeons who are considering joining the transgender workforce.

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