



A case report of gender-affirming mastectomy in a transgender individual with breast cancer

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Background: Gender-affirming mastectomy (GAM), in contrast to simple mastectomy (SM), utilizes preservation of subcutaneous and breast tissue to produce a cosmetically favorable result for transgender patients, however does not remove all future malignancy risk. Here we present a case report of a transmale patient who was evaluated for GAM and subsequently found to have a malignant breast mass, necessitating multi-disciplinary intervention and coordination between breast and plastic surgery teams. This patient's unique and rare presentation with breast cancer prior to GAM emphasized the paucity of previously detailed cases in the literature and demonstrated the likely degree of variability in decision-making for treatment of these patients without universal guidelines for management.

Case Description: The patient is a 47-year-old African American transgender male who was found to have a 3-cm breast mass on routine pre-operative mammographic screening prior to GAM. Pathology confirmed grade II invasive ductal carcinoma (IDC) and further genetic testing showed the patient was BRCA2 positive. The breast and plastic surgery teams coordinated the GAM to best address the mass while achieving cosmetic goals. This case was complicated by positive nipple margins on intra-operative cold specimen, which necessitated deviation from the initial plan to perform bilateral nipple grafts, and instead utilized excess areolar tissue from the left nipple to reconstruct the contralateral right nipple. Graft survival and overall repair quality at 6 weeks was satisfactory to both patient and provider.

Conclusions: This case highlights several of the challenges encountered when considering or performing GAMs in transmale patients with underlying breast cancer. Surgical considerations for these patients differ from cisgender individuals undergoing mastectomy for oncologic breast findings. Further research is needed to better determine the ideal operative practice and ideal follow-up screening for these patients.

Keywords: Breast cancer; gender-affirming mastectomy (GAM); screening; nipple grafting; case report

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Introduction

Advancements in transgender medicine continue to bring better care to an underserved patient population. However, with the growing scope and breadth of this field, also comes an increase in novel challenges and questions regarding care of these patients. Gender-affirming mastectomy (GAM) provides means to surgically alter the appearance of the patient's chest so that it may better align with their gender identity. Of note, this procedure preserves some subcutaneous and breast tissue to provide a more natural-

appearing result. This contrasts with a simple mastectomy (SM), which removes as much breast tissue and skin as possible to reduce current tumor burden and also reduce future malignancy risk. Unfortunately, ideal breast cancer screening guidelines in patients who undergo GAM remains undetermined (1-4). Further, many of these patients are on exogenous hormone therapy, and data on how exogenous androgens impact breast cancer incidence is tenuous at best (5-8). This also raises the question - in the setting of planned gender affirming mastectomy, what

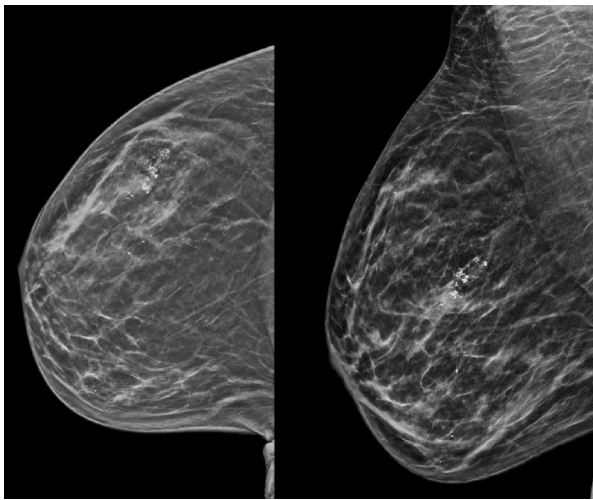


Figure 1 Screening mammography images of a 47-year-old transmale patient. Shown is the right breast with 3 cm area of microcalcifications.

pre-operative screening, if any, should take place and to what extent. Consider a young patient, <40 years, with no significant personal or family history. For this situation, screening guidelines are not currently well delineated. Considering the technical difficulties associated with performing mammography on a patient post-GAM, such as minimal breast tissue or presence of scar tissue which can impede imaging and identification of pathologic changes, the necessity and clinical efficacy of such screening is also questionable (9-11). These challenges, combined with no standardized best-practice screening guidelines for transgender patients undergoing GAM, can leave transgender patients in a screening and follow-up care gray area. Herein we present a case report of a transmale patient who desired GAM, and upon pre-operative screening was found to have a malignant breast mass prior to surgery, with further follow-up genetic testing revealing BRCA2 mutation. These findings necessitated multi-disciplinary intervention and coordination between breast surgery, plastic surgery, hematology-oncology, and radiation-oncology teams in order to achieve a cosmetically favorable, masculine-appearing chest, while safely removing malignant tissue, reducing risk of recurrent malignancy in the future, and providing comprehensive follow-up care and adjuvant treatment for the patient. We present the following case in accordance with the CARE reporting checklist (available at <https://tbcrc.amegroups.com/article/view/10.21037/tbcr-22-14/rc>).

Case presentation

The patient is a 47-year-old African American transgender male with a past medical history of gender dysphoria, hypertension, hyperlipidemia, type 2 diabetes mellitus, peripheral neuropathy, small vessel myocardial infarction (MI), and tobacco use, who initially presented for consultation regarding bilateral GAM. He desired this procedure for cosmesis of a masculine-appearing chest, which better conformed with his preferred gender identity. As part of the pre-operative assessment for this procedure, he underwent mammographic screening in July, 2021. On mammography, a 3-cm area of calcification was noted in the right breast at the 8:00 position, 7 cm from the nipple (*Figure 1*). This mass was subsequently biopsied the following month, August 2021, and pathology showed grade 2 invasive ductal carcinoma (IDC). Fluorescent in situ hybridization (FISH) showed cells that were estrogen receptor (ER) positive, progesterone receptor (PR) weakly positive, Her2 negative. Underlying ductal carcinoma in situ (DCIS) was also noted on mammography. Further discussion with the patient revealed a family history significant for breast malignancy, and this prompted further genetic testing in November 2021, which unfortunately showed he was positive for the BRCA2 mutation. The patient was counseled on the impact of this diagnosis, and the difficulties that arise with breast cancer screening following traditional GAM. A decision was made to pursue multidisciplinary intervention by both the breast surgery and plastic surgery teams, along with consultation of hematology-oncology and radiation-oncology multidisciplinary tumor boards for adjuvant therapy options. A timeline of his presentation to us is listed in *Figure 2*.

A SM with intra-operative frozen specimen pathological analysis and sentinel node biopsy was planned for November 2021 by the breast surgery team. The plastic surgery team was to then perform subsequent free nipple grafting and cosmetic closure. The breast cancer team completed their portion of the surgery without complications. The plastic surgery team marked him in pre-op for planned cosmetic closure. A no-vertical-scar approach was taken to minimize the amount of residual breast tissue after surgery, optimize cosmesis, and minimize scar burden. The breast team used these markings to guide their incisions and mastectomy operation. As their portion of the operation was nearing its end, the plastic surgery team came in to provide adequate closure and nipple reconstruction. The nipples were placed in saline and prepared for nipple reconstruction as full

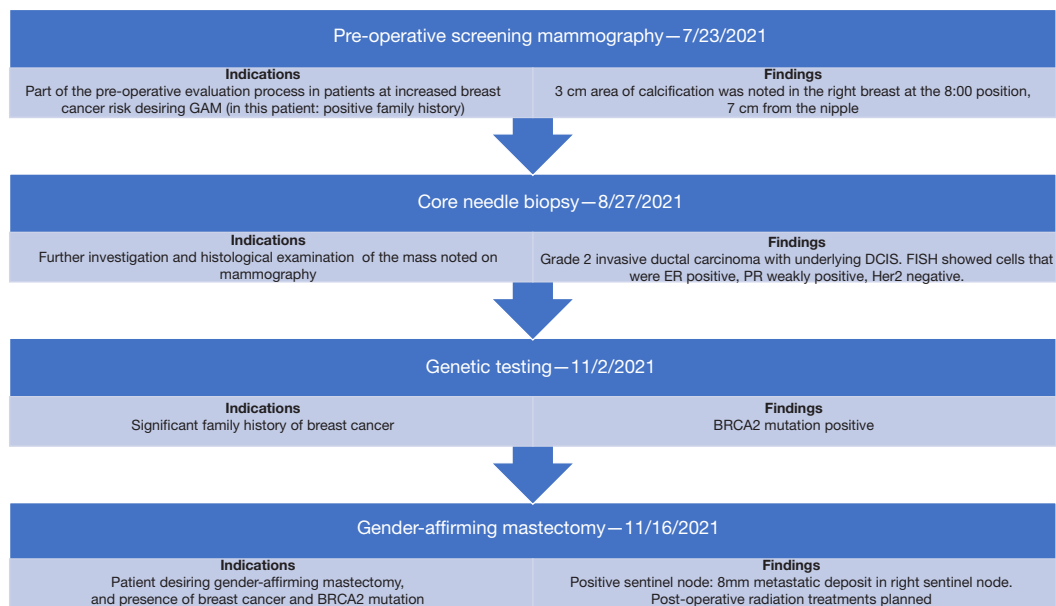


Figure 2 Timeline of the presentation and screening undergone by a 47-year-old transmale patient prior to his gender-affirming mastectomy. GAM, gender-affirming mastectomy; DCIS, ductal carcinoma in situ; FISH, fluorescent in situ hybridization; ER, estrogen receptor; PR, progesterone receptor.

thickness grafts. Thus, nearly all of the subcutaneous tissue was excised with straight iris scissors with the exception of a central piece of subcutaneous tissue left at the center of the nipple to provide appropriate nipple projection and construct a masculine-appearing nipple. As the nipple grafts were being prepared, the immediate pathology results became available and noted positive nipple margins in the right breast, making the right nipple unusable for graft reconstruction. This information was learned after our plastic surgery team had begun nipple reconstruction in the typical fashion of utilizing the tissue from each nipple. This meant that the circular graft had been marked and cut from the left nipple without more consideration to the excess peri-areolar tissue on this side seeing as this tissue is typically disposed of. The positive malignant pathology of the right nipple guided our plastic surgery team to adapt to the circumstance to still carry out nipple reconstruction. All surgical instruments which had been contaminated through use on the right nipple were set aside as dirty. The excess areolar and peri-areolar tissue that had been cut away from the left nipple was re-examined. The leftover tissue overall met the area (cm²) required to reconstruct another nipple but not in the correct circular shape. This led our team to suture together two pieces of tissue to re-create a round nipple graft. This nipple was stripped of

excess subcutaneous tissue on the inferior side except for a small protrusion left at the center for nipple projection in parallel to that done for the left nipple. The two pieces were connected by simple running chromic suture and then grafted to the right side. The patient suffered no immediate post-operative complications.

Post-operatively, this patient was found to have positive sentinel node pathology, with an 8-mm metastatic deposit in the dissected right sentinel node. This patient's case was discussed at a multi-disciplinary tumor board meeting and was determined to be an appropriate candidate for post-operative axillary radiation therapy, with no further surgical intervention at that time. At the most recent follow-up of 6 weeks post-operation, the patient has had no complications, infection, or nipple graft failure, and was satisfied with the results of his operation (*Figure 3*). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

Discussion

Described above is one of only several cases in which a transmale underwent GAM following breast cancer

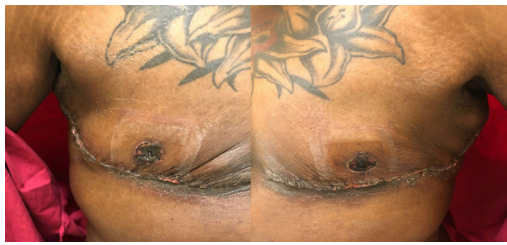


Figure 3 GAM with free nipple grafting of a 47-year-old transmale patient, 2 weeks post-operation. GAM, gender-affirming mastectomy.

diagnosis (12,13). Further, this is the first documented case report of an individual also discovering BRCA2 positivity as a result of pre-operative screening. Additionally, we present a unique case in which positive nipple margins necessitated the usage of contralateral nipple and areolar tissue in order to provide adequate tissue for both nipple graft reconstruction.

This case highlights several of the challenges encountered when working with transmale patients for gender-affirming mastectomies. Surgical considerations for these patients differ from cisgender individuals undergoing mastectomy for oncologic breast findings. In cisgender individuals, the goal is to preserve breast tissue for favorable cosmetic outcomes while removing malignant tissue to provide safe and effective surgical resection. In instances where total mastectomy is necessitated, excess skin may be left in order to provide an adequate pocket for breast augmentation with insertable implants in the future. However, in transgender individuals, the cosmetic goals of the operation often differ, as patients are undergoing such procedures for cosmesis of a relatively masculine-appearing chest.

Screening guidelines in these patients is also still undetermined, and its specifics are complicated by several factors (2,4). While transgender patients have similar incidence of breast cancer to cisgender patients, transgender patients have numerous unique barriers to healthcare and preventative screening that can make preventative care difficult (14). Even after adjustment for sociodemographic differences, transgender patients have markedly lower rates of adherence to breast cancer mammography screening in comparison to cisgender patients, potentially due to a number of factors including stigma, poor patient population outreach, and patient dissonance experienced due to participating in care that conflicts with their gender identity (15). As such, even without including additional

theoretical cancer risk associated with the transgender patient population, such as hormone therapy, this patient population is at higher risk of undiagnosed or late-stage breast cancer due to lower screening compliance in comparison to the cisgender population.

Secondly, the impact of masculinizing hormone therapy on cancer incidence remains unclear (5-8). Literature detailing post-GAM differences in incidence of breast cancer in patients, especially those who continue on hormone therapy, is also limited (16). In short, hormone therapy adds to the uncertainty of malignancy risk in these patients. One must also note the surgical differences between a cosmetic top surgery, which leaves some breast tissue in favor of a cosmetically favorable masculine-appearing chest, and a prophylactic mastectomy, which removes as much breast tissue as possible to reduce risk of cancer in the future. There is an undeniably increased theoretical risk of malignancy in these patients due to an increased amount of residual breast tissue in comparison to total mastectomy patients, however the magnitude of this risk, and the clinical significance of such risk, is yet to be determined.

These are several factors that all complicate the picture of best-practice screening in top surgery patients. These patients necessitate a multi-disciplinary conversation to determine lifetime risk, incorporating consideration for pathology of the cancer specimen, genetic mutations like BRCA1/2, post-operative chemotherapy, radiation, or pharmacologic selective estrogen-receptor modulator prophylaxis, and continued post-operative masculinizing hormone use, to determine how aggressively post-operative screening should occur, and with which imaging modality.

In addition to the discovery of breast cancer during pre-operative screening of this patient, and the questions on operative technique and post-operative care that such finding brings up, this patient's pathology presented a unique intra-operative challenge to the attempted bilateral free nipple grafting due to intraoperative finding of positive nipple margins on the right breast. Under nonpathological conditions, free nipple grafting is a safe and effective procedure to achieve patient cosmetic goals for GAM (17-19). Unfortunately, due to the intra-operative specimen analysis which showed positive nipple margins, bilateral free nipple grafting was not a viable option. This necessitated free nipple grafting and reconstruction of both nipples from the healthy left nipple. Utilization of the contralateral nipple for bilateral reconstruction was further complicated by report of the intra-operative pathology after the left nipple had been debulked and stripped of a significant amount of

the peri-areolar tissue, which normally would be used to reconstruct the contralateral nipple in such cases where both nipples cannot be used as their ipsilateral grafts. This clinical circumstance provides insight for future cases of GAM in the setting of breast cancer because it provided the lesson to wait for nipple reconstruction until after frozen pathology has resulted as this keystone result will determine the manner in which nipple reconstruction can best be achieved. Data on patient-reported outcomes following free nipple grafting with GAM is also sparse in the literature (20), and data on free nipple grafting using a unilateral to bilateral technique as described above has no significant outcomes data. Current literature suggests a sharp decline in patient-reported satisfaction with free nipple grafting for GAM after 30 days post-operation (20), however at 6-week follow-up this patient this patient remains satisfied with the quality of his repair. Of note, the patient desires revision surgery following completion of his radiation treatment for removal of excess axillary tissue. At 6 weeks post-operation, the patient remains without complications including partial or total nipple necrosis, wound infection, and wound dehiscence.

Strengths and limitations

Strengths

This case augments the literature by describing the management of breast cancer diagnosed prior to GAM, with treatment carried out by a surgeon experienced in gender-affirming top surgery. This case also took place at a large academic center, allowing for the collaboration with a breast oncology surgical team in the management of this patient.

Limitations

Similar to those inherent to any case report, limitations of this case report include limited sample size, retrospective design, limited ability to generalize findings to larger populations, and inability to establish any cause-effect relationships.

Conclusions

In conclusion, this patient presented several challenges and pathologic findings that highlight the difficulties associated with providing the best care to transgender patients undergoing GAM or total mastectomy. Due to issues like

access, outreach, and stigma, breast cancer screening is difficult in transgender patients pre-mastectomy. And due to issues like feasibility, non-universal guidelines, and unclear clinical indications and unclear path of best practice, breast cancer screening is difficult in these patients post-GAM. Overall, even without the presence of potential oncogenic risk factors like exogenous androgen therapy or BRCA2 positivity as seen in this patient, such a gap in breast cancer screening means transgender patients have poor screening coverage and potentially take on additional risk and uncertainty when undergoing GAM, as they migrate from an area of poor compliance to screening as pre-operative transgender individuals, to being post-operation, in an area where screening guidelines are practically nonexistent, and consistent, robust data and literature to address this gap in care is simply unavailable at present. This case report highlights these challenges and outlines the steps taken in order to try and provide the best care for such patients.

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Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist (available at <https://tbc.amegroups.com/article/view/10.21037/tbcr-22-14/rc>).

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://tbc.amegroups.com/article/view/10.21037/tbcr-22-14/coif>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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