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## Case Report

# Local Recurrence of Invasive Secretory Breast Carcinoma in a Gravid Patient Post-Mastectomy<sup>☆</sup>

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## ABSTRACT

This is a case of locally recurrent invasive secretory carcinoma of the breast during pregnancy, detected as a palpable mass in the reconstructed right breast of a 32-year-old female at 24 weeks gestation. The patient was initially diagnosed with secretory carcinoma 8 years prior, for which she underwent nipple sparing mastectomy followed by adjuvant chemotherapy and endocrine therapy. Due to pregnancy, the recurrence was treated initially with conservative excision alone, followed by definitive management postpartum which included wide local excision, sentinel lymph node biopsy and adjuvant chest wall radiation. Secretory carcinoma of the breast is a rare cancer with a predilection for young age and indolent course. This case report describes an unusual case of recurrent secretory carcinoma, of interest due to both its diagnosis during pregnancy, and its recurrence after nipple sparing mastectomy.

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## Introduction

Secretory carcinoma of the breast is an extremely rare form of breast cancer, and is generally slow growing and carries an excellent prognosis. While initially found in children and ado-

lescents, few cases in the adult population have been diagnosed. Given its rarity, no consensus exists for treatment and follow up, though the approach includes surgical removal via lumpectomy or mastectomy and occasionally radiation. Depending on the patient demographics, chemotherapy and endocrine therapy may be added to improve cancer survival.

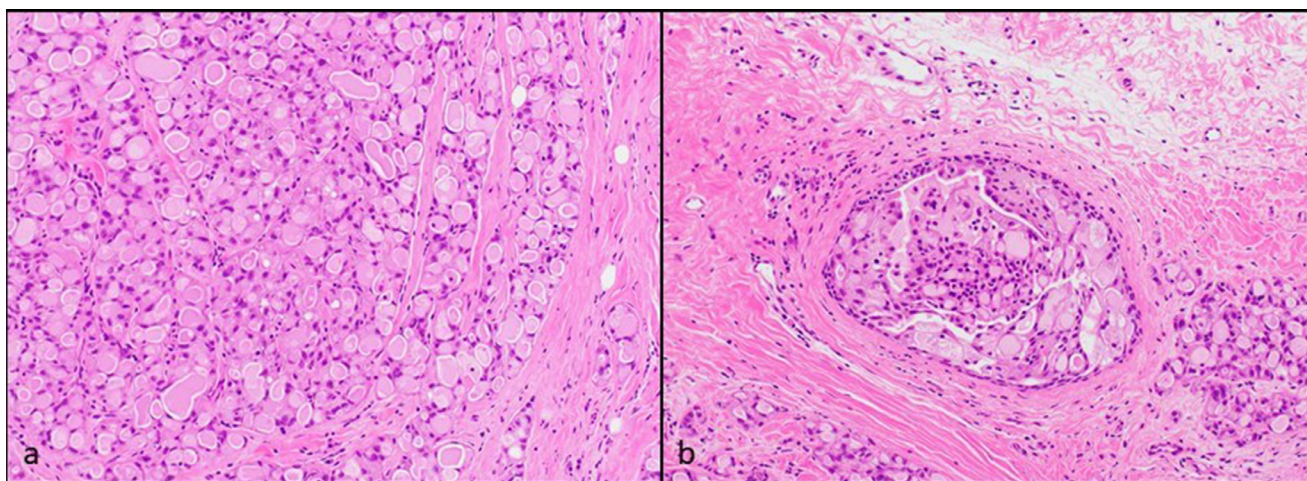
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**Fig. 1 – High power magnification views of slides from the primary diagnosis of secretory carcinoma in 2012, showing (A) invasive carcinoma characterized by neoplastic epithelial cells with rounded uniform appearing nuclei, vacuolated cytoplasm and pale eosinophilic intraluminal secretions and (B) a duct involved by proliferation of neoplastic epithelial cells with similar features.**

### Case report

This is a case of a 32-year-old female with recurrent invasive secretory carcinoma of the right breast treated with bilateral nipple sparing mastectomies. She initially presented at 24 years of age with unilateral right bloody nipple discharge. Evaluation revealed four scattered discrete soft tissue nodules in the lower right breast on ultrasound evaluation, the largest measuring 10 mm. These correlated with enhancing masses on dynamic pre- and post-contrast breast MRI. Two-site ultrasound guided biopsy was positive for malignancy at both sites.

Though the left breast did not show any worrisome findings, the patient elected to undergo bilateral nipple sparing mastectomies with prepectoral silicone implant reconstruction for risk reduction and symmetry purposes. Final surgical pathology (Fig. 1) revealed multicentric secretory carcinoma, Nottingham grade I (of III) with an associated *in situ* component. Estrogen receptor was low positive (1%-10%), HER-2 Neu was negative. Multiple tumors spanned a 6.5 cm area in the lower right breast, with the largest mass measuring 10 mm. Surgical margins were negative for malignancy. Ki-67 index was low at 4.5%. Axillary sentinel lymph node was negative for malignancy. Genetic panel (at time of initial diagnosis) was negative for known deleterious *BRCA1/2* mutations. She received adjuvant Docetaxel/Cytosin chemotherapy and took tamoxifen for several years until she began *in vitro* fertilization.

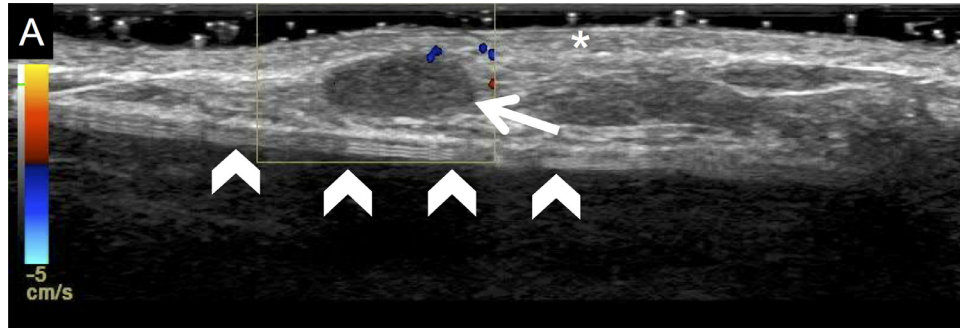
Eight years later, at 32 years of age and 24 weeks gestation, the patient presented with a palpable mass in her reconstructed right mastectomy flap. Ultrasound confirmed a 6 × 3 × 7 mm oval, indistinct, hypoechoic mass with minimal internal vascularity (Figs. 2-3). The patient had a BMI of 22 and the flap was quite thin. The mass was located at 6 o'clock, superficial to the silicone implant capsule in the

subcutaneous fat of the mastectomy flap. Ultrasound guided biopsy using a 14-gauge spring loaded BARD biopsy device yielded recurrent invasive secretory carcinoma, estrogen and progesterone receptor negative and HER-2/neu negative. Further genetic workup was not done at this time. Right axillary ultrasound showed no lymphadenopathy.

Given her gravid state, the patient was initially offered either early induction of pregnancy with immediate definitive resection, or local surgical resection with planned delayed definitive treatment postpartum. She opted to delay definitive treatment until after parturition and underwent surgical excision of the recurrence. Pathology revealed a 9 mm mass with negative margins. Her unique case was presented at an institutional multidisciplinary breast conference, and multiple options including extensive capsulectomy, radiation, and systemic treatment were discussed. Ultimately, the multi-disciplinary recommendation was for repeat MR post-partum, followed by possible definitive local treatment with wide surgical resection, sentinel lymph node biopsy, post-mastectomy radiation, and possible systemic therapy.

Post-partum dynamic pre- and post-contrast MR examination showed no residual disease. The patient underwent bilateral capsulotomy and implant exchange. Due to ongoing nipple mastalgia, the patient also requested an elective resection of her nipple areolar complexes which was performed for symptomatic treatment but was not considered therapeutically necessary for treatment of her recurrence or risk reduction.

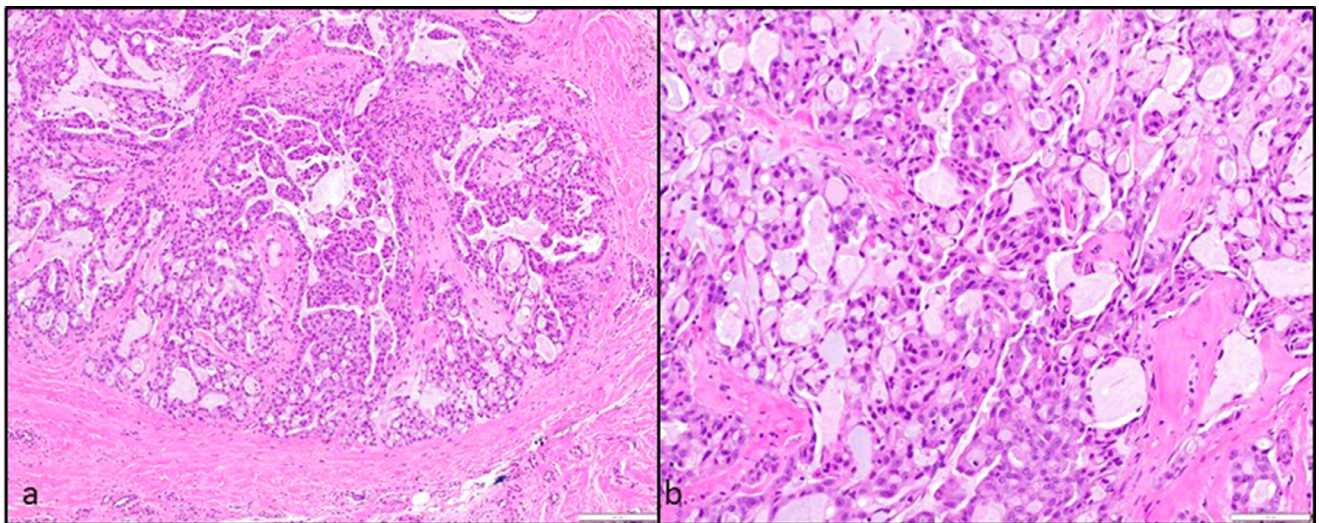
Final surgical pathology and left axillary sentinel lymph node biopsy were negative for malignancy. Adjuvant post mastectomy radiation with a focal resection cavity boost to the site of recurrence was delivered over 5 weeks. There are plans for repeat reassessment at 6 months post-surgery with MR, at which time systemic treatment will be readdressed.



**Fig. 2** – Color Doppler transverse Figure of the palpable area of concern shows minimal vascularity within the oval hypoechoic mass (arrow). The mass was located between the skin (\*) and the envelope of the silicone implant (chevrons) in the subcutaneous fat.



**Fig. 3** – Greyscale longitudinal Figure shows an oval hypoechoic mass (arrow) in the right breast at 6:00, 4 cm from the nipple between the skin (\*) and the envelope of the silicone implant (chevrons) in the subcutaneous fat.



**Fig. 4** – Magnification views of slides from the recurrent secretory carcinoma diagnosed in 2021. (A) Medium power and (B) high power magnification showing an invasive carcinoma with morphologic features identical to those seen in the patient's primary tumor from 2012. Also note the relative circumscription and sclerosis in the background stroma, a feature not uncommon in secretory carcinoma of the breast.

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## Discussion

Secretory carcinoma of the breast (SBC) is an extremely rare form of breast cancer that typically grows slowly and generally carries an excellent prognosis [1–3]. SBC accounts for less than 0.1 % of all infiltrating breast carcinomas [2]. Initially discovered in children and adolescents it was termed “juvenile breast cancer”, and only was later renamed “secretory carcinoma” after multiple cases were discovered in adults [2,4]. While having an overall favorable prognosis, up to 30% of cases have been associated with axillary lymph node metastases [1,4]. Despite this, local recurrence and metastatic disease have rarely been reported [1]. A 2012 review used the SEER database to identify 83 cases of secretory cancer between 1983 and 2007. The average patient age at diagnosis was 53. Overall survival rates at 5 and 10 years were 87.2% and 76.5%, respectively [4]. Cause-specific survival rates were 94.4% at 5 years and 91.4 % at ten years.

Histologically secretory carcinoma shows variably sized nodules of neoplastic epithelial cells admixed with a sclerotic background stroma [5]. The cells show round uniform nuclei with low grade atypia, variably prominent nucleoli and foamy or vacuolated cytoplasm. A characteristic feature is the presence of pale eosinophilic or slightly basophilic intraluminal secretions. Occasionally, an *in-situ* component is also identified [5]. Typically, SBC is negative for hormone receptors (estrogen and progesterone) and human epidermal growth factor receptors (HER-2/neu) [2–4]. The majority (> 90%) of the cases of secretory carcinoma harbor chromosomal translocation t(12;15) (p13;q25), resulting in ETV6-NTRK3 fusion gene [6].

Due to its rarity, the optimal treatment strategies for primary or recurrent secretory carcinoma of the breast remain to be determined [3]. While surgery is widely considered to be the most appropriate initial treatment, both lumpectomy and mastectomy are commonly performed without a clear consensus on the optimal extent of surgery [2,4]. Radiation has become more frequently used over time [4], though it, too, lacks consensus recommendations in this setting. Radiation is more commonly used in conjunction with lumpectomy than after mastectomy and is rarely used in children or young women [4].

In this case, the decision to pursue adjuvant chemotherapy and endocrine therapy at the time of the original diagnosis

was based on lengthy discussion with the patient. She opted to undergo treatment in order to improve her specific cancer survival risk given her young age and the tumor size. Radiation was deferred at original presentation and recommended only after recurrence. Factors associated with recurrent secretory carcinoma includes larger initial tumor size and older age at time of initial diagnosis [2]. To our knowledge, no prior published literature has described pregnancy affiliated recurrence of secretory carcinoma, or local recurrence of secretory carcinoma following nipple sparing mastectomy.

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## Patient consent

The patient consent has been obtained for the publication.

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