

Invasive Mammary Carcinoma in Young Women

Student Researcher: Jessica Ravert

Faculty Advisor: Gina Capitano Ed.D. R.T. (R)

Introduction

Breast cancer is the leading cause of cancer-related death in young women ages 15-3 in the United States (Langman, Kuzmiak, Brader, Thomas, Alexander, Lee, & Jordan 2021). Currently, there is not a widely used breast cancer screening for young women absent of known risk factors; resulting in younger women being diagnosed at a more advanced stages of the disease process. Many young women often present with findings such as palpable lumps, pain, nipple discharge, and changes in the skin of the breast. Imaging of young women aims to keep radiation dose as low as possible while targeting the symptomatic area (Langman, et al., 2021). Ultrasound is the typical initial imaging examination in patients younger than 30 followed by mammography if the ultrasound findings are suspicious.

Invasive breast cancer is often the diagnosis for these young women. Invasive breast cancers are cancers that have invaded or infiltrated into the surrounding healthy tissue (Breastcancer.org, n.d.). Invasive mammary carcinoma is defined as a tumor that has features of both ductal carcinoma and lobular carcinoma (Johns Hopkins Medicine, n.d.). It is considered a mixed tumor and typically begins as ductal carcinoma that has spread to the surrounding lobules (Breastcancer.org, n.d)

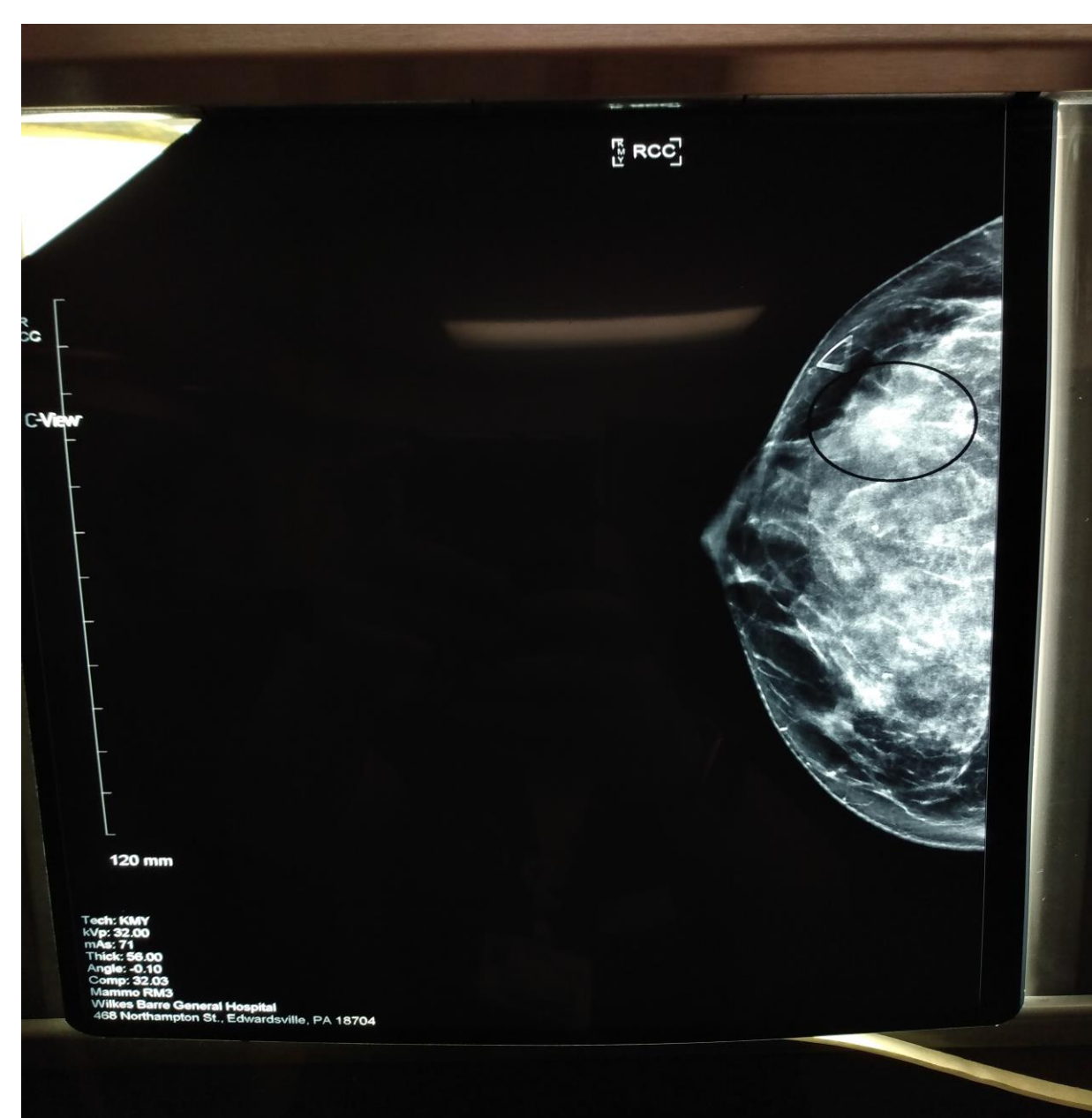
Case Study

Subject: 34-year-old patient presenting with a right palpable breast lump measuring 1.9 cm on mammographic images.

Imaging: Diagnostic mammogram with spot compression of the area, ultrasound followed by ultrasound guided breast biopsy.

Bilateral diagnostic tomosynthesis and two-dimensional synthesized images were performed.

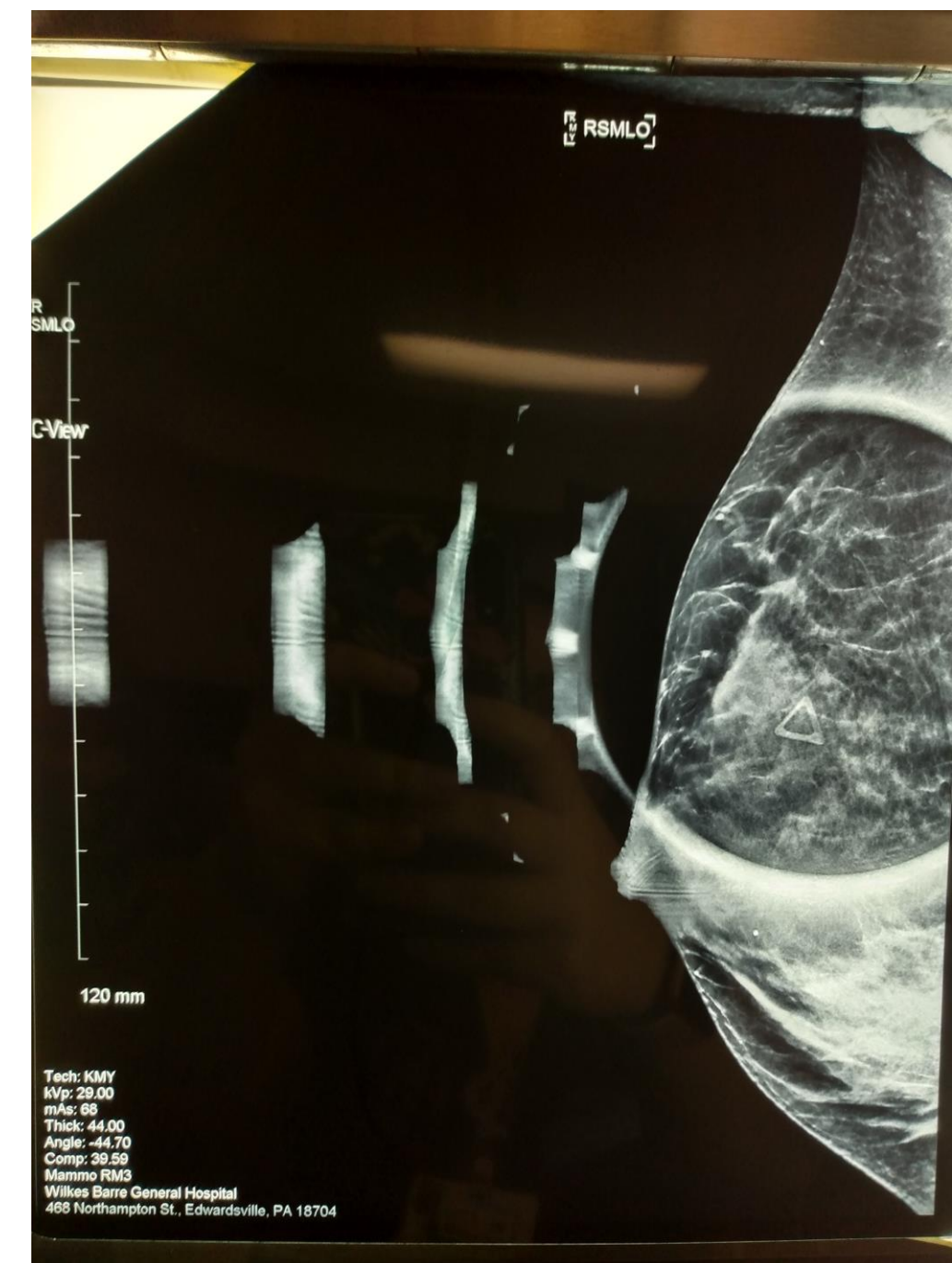
Diagnosis: Invasive Mammary Carcinoma.



The palpable lump is represented on the craniocaudal image as the circled area (Thomas P. Saxton Medical Pavilion, 2021)

Findings

Triangular marker placed in the upper outer quadrant of the right breast over the area of palpable mass.



(Thomas P. Saxton Medical Pavilion, 2021).

- Palpable mass correlated with a highly suspicious focal asymmetry with associated architectural distortion.
- Ultrasound indicated a highly suspicious mass found 4 cm from the nipple. Mass had irregular borders and was hyperechoic on ultrasound. No suspicious axillary lymph nodes located.
- The patient was categorized utilizing Breast Imaging Reporting and Data System (BI-RADS) which assesses risk of malignancy. Categorized as BI-RADS 5 which is highly suggestive of malignancy.
- Specimen of the right breast mass was obtained by ultrasound guided biopsy.
- Surgical pathology report indicated invasive mammary carcinoma *Nottingham Grade Three*.

The Nottingham Grade is a scoring system used for assessment of breast cancers grade one being least aggressive and grade three being most aggressive. There was no lymphovascular invasion seen (Thomas P. Saxton Medical Pavilion, 2021).

Additional Research Results

According to the World Health Organization (WHO) approximately 146,000 new breast cancer cases are reported in women younger than 40 worldwide each year (Fabiano, Mando, Rizzo, Ponce, Colo, Loza, Loza, Amat, Mysler, Costanzo, Nervo, Nadal..., 2020).

Tumors are more likely to be clinically detectable in young women when compared to women over the age of 40. According to Langman et al., 91.8% (101) of the patients in their research study presented with a palpable mass (2021).

Diagnosis Variations Between Older & Younger Women

American College of Radiology (ACR) Appropriateness Criteria for palpable breast lumps states that mammography or digital breast tomosynthesis can aid in the detection of additional lesions in young patients no matter their age who have suspicious clinical or imaging findings (Langman et al., 2021).

Differences in tumor size, histologic subtypes, tumor grade, and lymphovascular invasion were seen between young patients and in patients older than 40.

Women under the age of 40 are often diagnosed with breast cancer at a later stage of the disease and have a poorer prognosis due to lack of widely used screening techniques.

A higher proportion of family history of breast cancer was found in young women in comparison to women greater than 40 years old (Fabiano et al., 2020).

Breast cancer in young women is unique and differs from breast cancer in women older than 40 in imaging findings, tumor biology, and clinical course.

Breast cancer in the patients younger than 40 years old often presents as multifocal or multicentric disease with malignant microcalcifications only visible on mammography (Langman et al., 2021).

To a limited extent it is believed that young women with breast cancer have inferior clinical outcomes. The main reason for mortality disparities is the biologic variability in young patients as compared to older patients. Age alone is not believed to be a contributing factor to the biologic complexity of a patient's breast cancer (Fabiano et al., 2020).

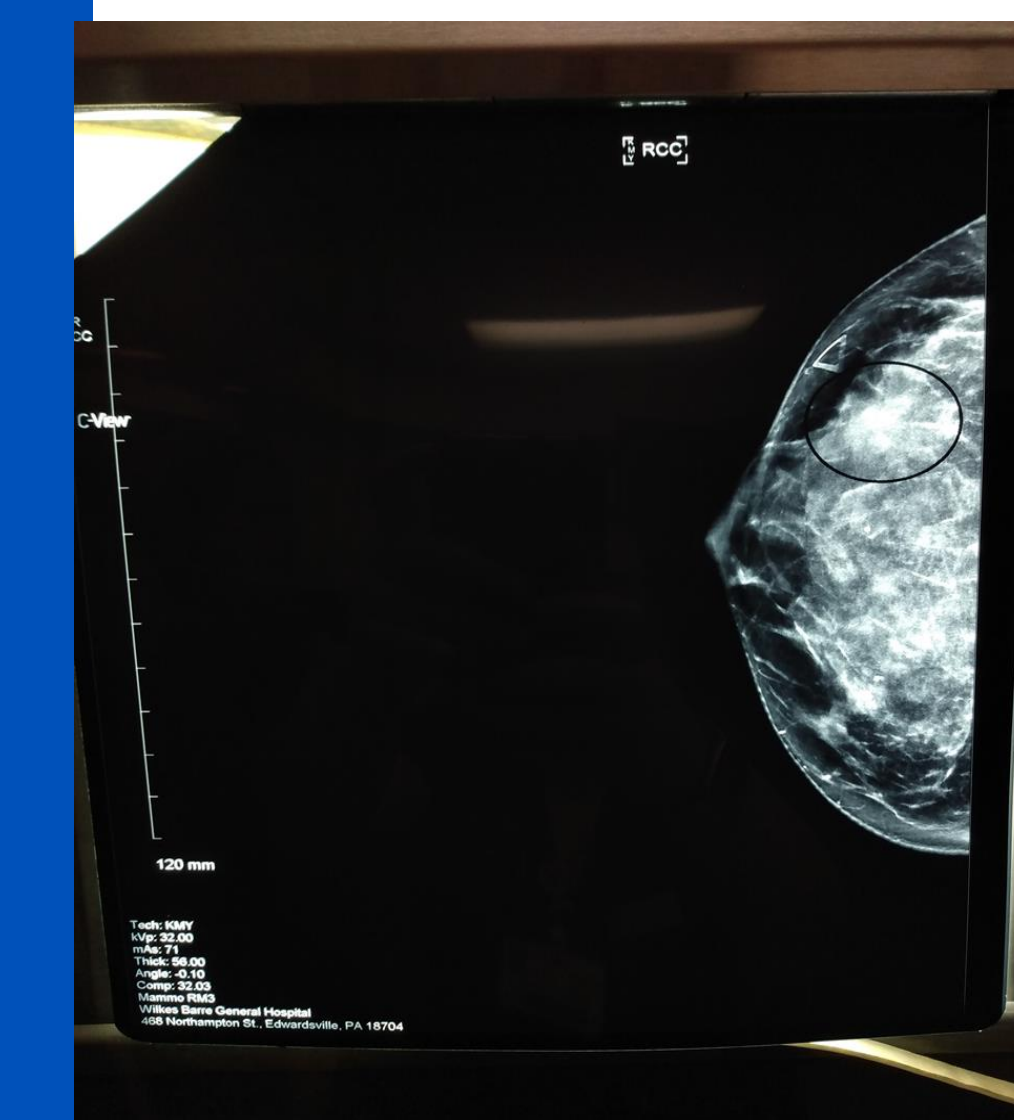
Cancer Types

About 80% of breast cancers are ER-positive which means that the cancer cells respond to the hormone estrogen. Between 10-20% of breast cancers are triple negative. This means that the cancer cells do not have estrogen or progesterone receptors and does not overexpress the HER2 protein (Shaw, n.d.) Research found that breast cancer recurred in 16.4% (18) of patients. The average time to recurrence in the study's population was 9.01 years from time of diagnosis. Patients who were ER positive had a statistically higher risk of recurrence whereas patients who were triple-negative nearly had recurrence-free survival. Overall survival of the research study was favorable with only 1.8% (2) known deaths within 5-7 years after diagnosis (Langman et al., 2021).

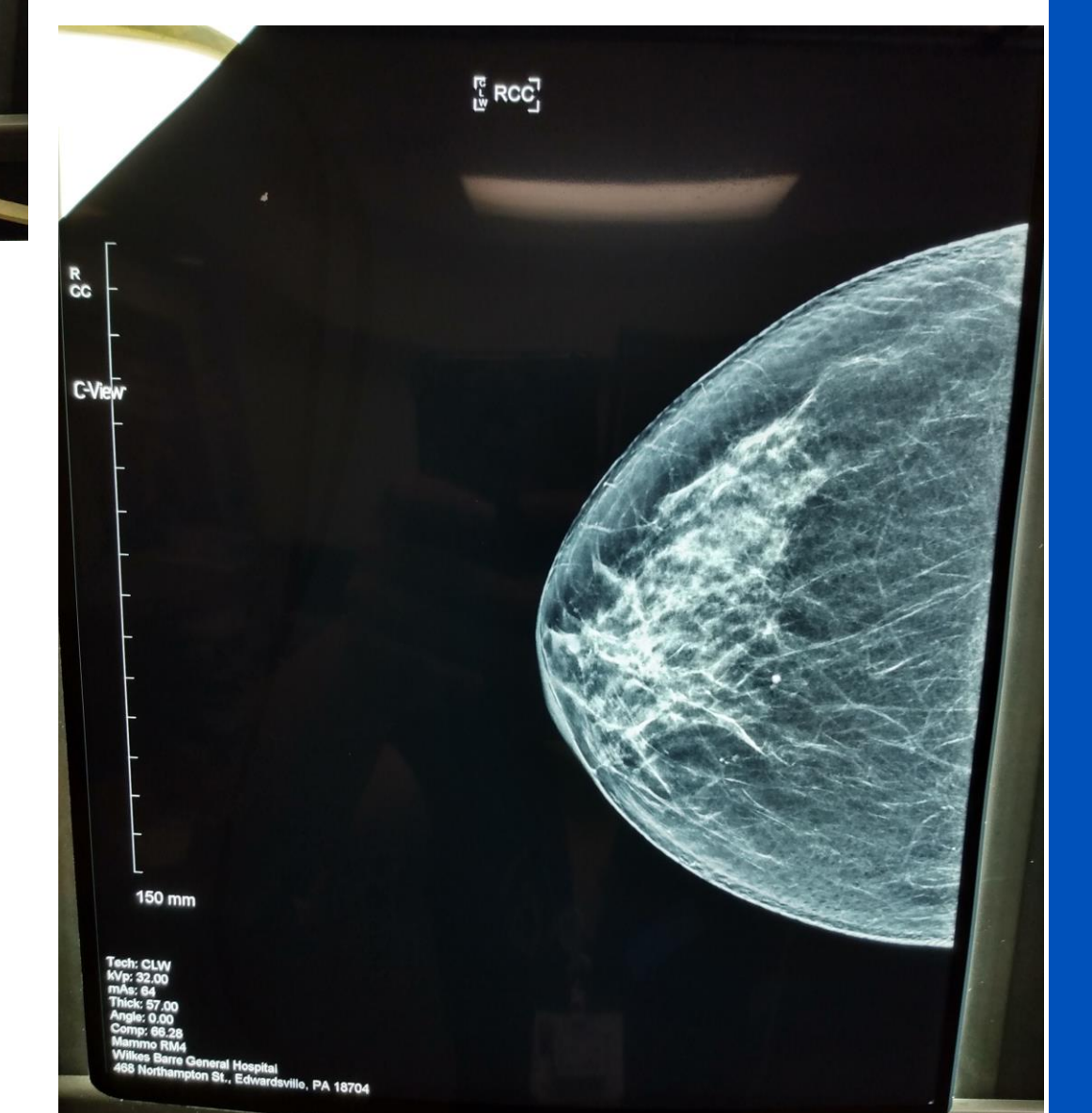
Types of Therapy

Research indicates, breast conserving therapy was performed in 62.89% of younger patients which is a substantially lower rate than older patients. In patients 40 years old and younger, adjuvant chemotherapy was used as treatment for 59.04% of patients whereas 36.66% of patients older than 40 underwent this treatment (Fabiano et al., 2020).

Neoadjuvant chemotherapy was used as treatment for 17.59% of younger patients and 8.37% of older patients (Fabiano et al., 2020). Mastectomy was part of treatment for most patients. Many patients in Langman et al.'s (2021) study underwent neoadjuvant chemotherapy, and radiation therapy was also a common treatment for young patients (2021).



Comparison of an abnormal mammogram indicating invasive mammary carcinoma (left) and a mammogram with benign findings (right) (Thomas P. Saxton Medical Pavilion, 2021).



Conclusion

Additional research on invasive breast cancers in the young population is necessary. In order to improve outcomes, special consideration for young patients with invasive breast cancer are needed relative to both diagnosis and treatment. When compared to women over the age of 40, imaging findings, tumor biology and clinical course are unique in young women (Langman et al., 2021). Breast cancer in young women is often associated with more aggressive forms of cancers as well as a worse prognosis. A limitation of the case study is that the patient decided to seek a second opinion from an outside facility and treatment and outcomes are unknown. Limitations of both research studies utilized in this project are small sample sizes, which further supports the need for additional research.