AMSER Rad Path Case of the Month:

85-year-old female with breast mass

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AMSER

Patient Presentation

85-year-old female presenting with a right breast mass that has been increasing in size, first noticed 8 months ago. She reports enlarging nipple and change in coloration of skin in upper outer breast. She denies any bleeding or pain relating to breast mass other than recent sensitivity in right axillary region. No history of prior breast problems.

Onset of menses at age 15, first live birth at age 19, P5 G5. She is postmenopausal, starting menopause in her 40s. No history of hormone replacement.

Pertinent History & Physical Exam

Family history: daughter with breast cancer at age 55, tested negative for any gene mutation

Social History: non-smoker, no alcohol

Physical exam: Right breast mass in upper outer quadrant with redness and enlargement of right nipple. No nipple discharge. No axillary lymphadenopathy.

What Imaging Should We Order?

ACR Appropriateness Criteria

A diagnostic mammogram with digital breast tomosynthesis (DBT) can address limitations encountered with standard mammographic views.

Variant 1: **Palpable breast mass. Female, 40 years of age or older, initial evaluation. (See Appendices 1A-1B for additional steps in the workup of these patients.)**

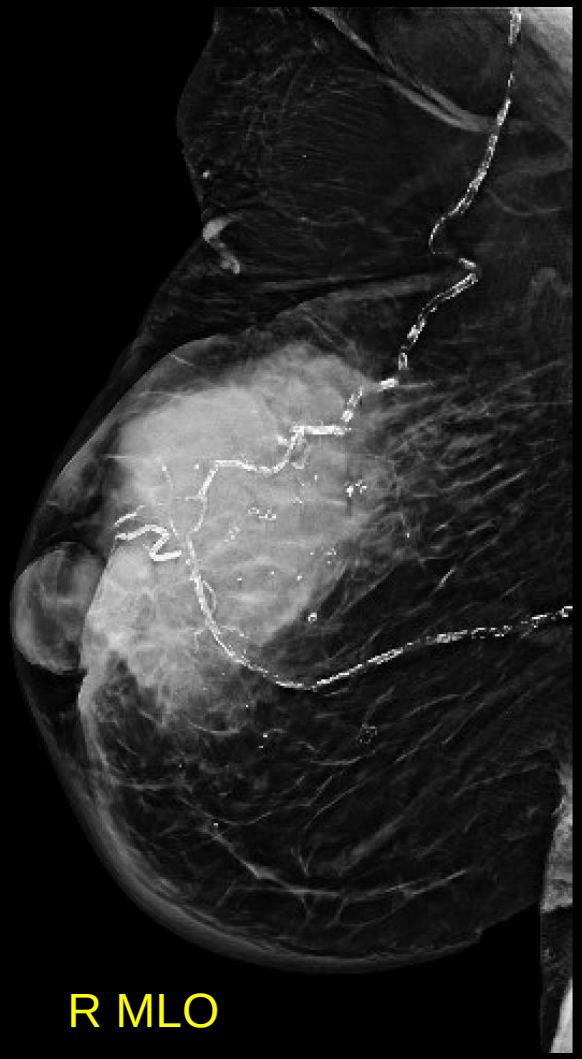
Radiologic Procedure	Rating	Comments	RRL*
Mammography diagnostic	9	See references [13-15].	☢☢
Digital breast tomosynthesis diagnostic	9	See references [16-18,20,85].	☢☢
US breast	4	If she had recent mammogram (ie, past 6 months), US may be appropriate.	O
MRI breast without and with IV contrast	2	See references [4,49].	O
MRI breast without IV contrast	1		O
FDG-PEM	1		☢☢☢☢
Sestamibi MBI	1		☢☢☢
Image-guided core biopsy breast	1		Varies
Image-guided fine-needle aspiration breast	1		Varies

If mammogram findings are suspicious for malignancy, ultrasound may further characterize the lesion and detect additional lesions not evident on mammography or DBT.

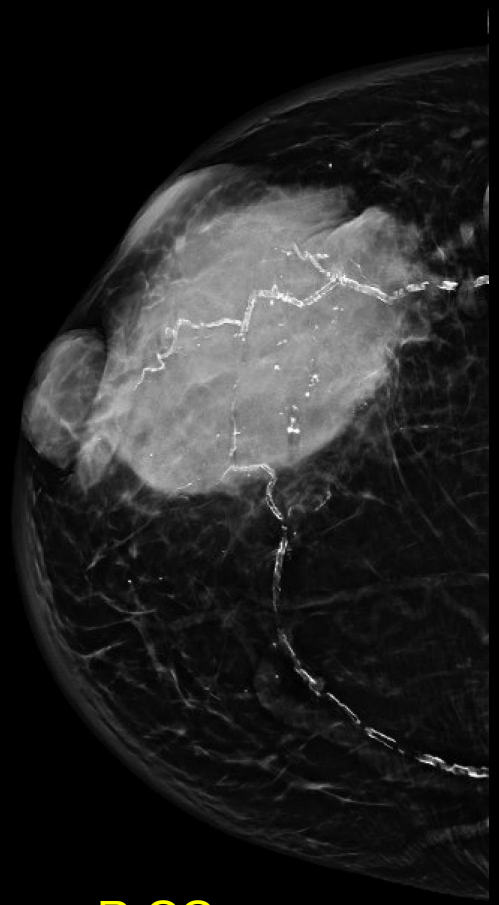
Variant 2: **Palpable breast mass. Female, 40 years of age or older, mammography findings suspicious for malignancy. Next examination to perform. (See Appendix 1A for additional steps in the workup of these patients.)**

Radiologic Procedure	Rating	Comments	RRL*
US breast	9	See reference [62].	O
MRI breast without and with IV contrast	2	See references [4,49].	O
Image-guided core biopsy breast	2		Varies
Mammography short-interval follow-up	1		☢☢
Digital breast tomosynthesis short-interval follow-up	1		☢☢
MRI breast without IV contrast	1		O
FDG-PEM	1		☢☢☢☢
Sestamibi MBI	1		☢☢☢
Image-guided fine-needle aspiration breast	1		Varies

Diagnostic Mammogram and Ultrasound Right Breast
(not labeled)

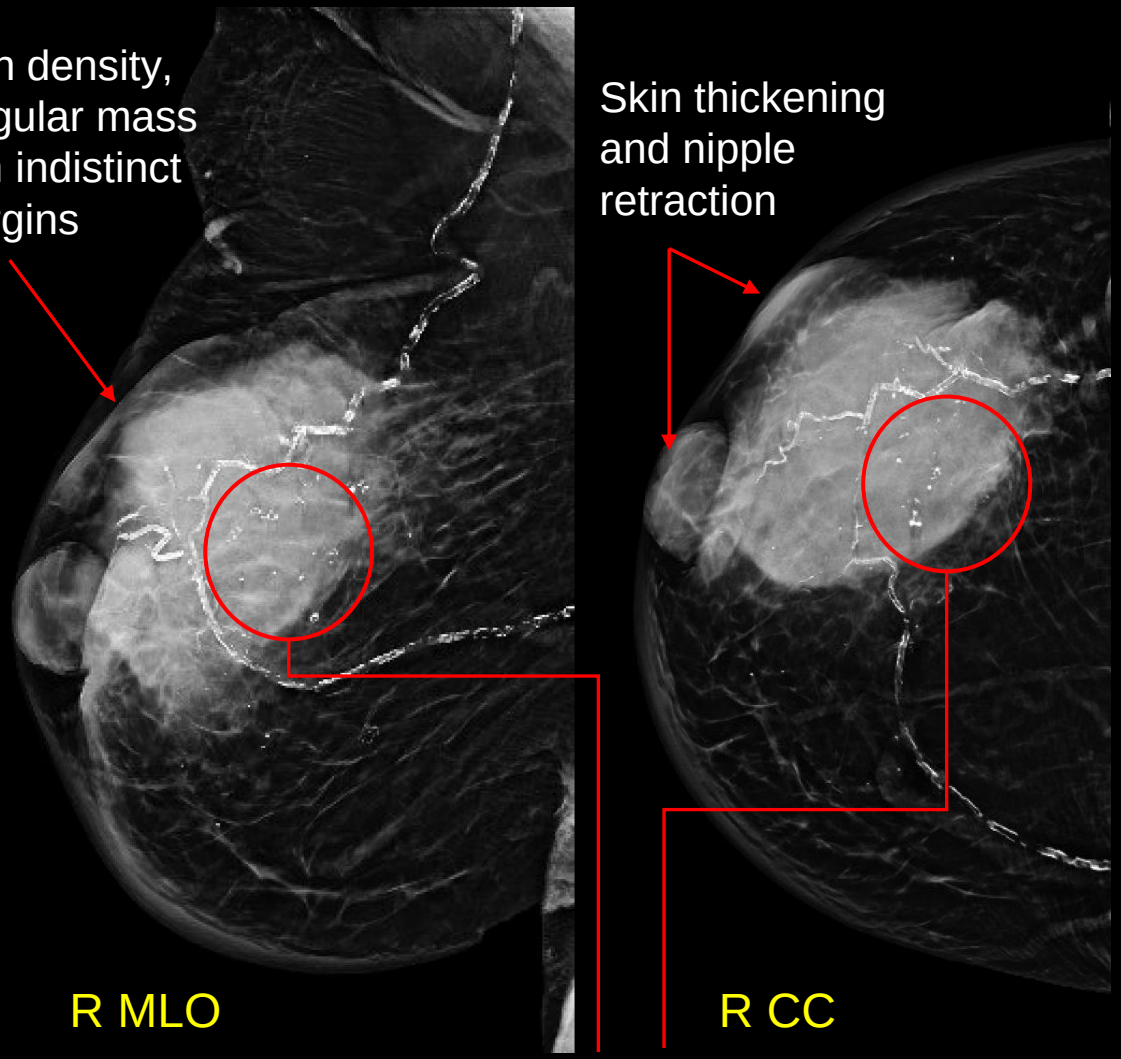


R MLO



R CC

Diagnostic Mammogram and Ultrasound Right Breast



High density, irregular mass with indistinct margins

Skin thickening and nipple retraction

R MLO

R CC

Coarse heterogenous calcifications with grouped distribution

Not parallel orientation

Microlobulated margins, Hypoechoic relative to adipose tissue

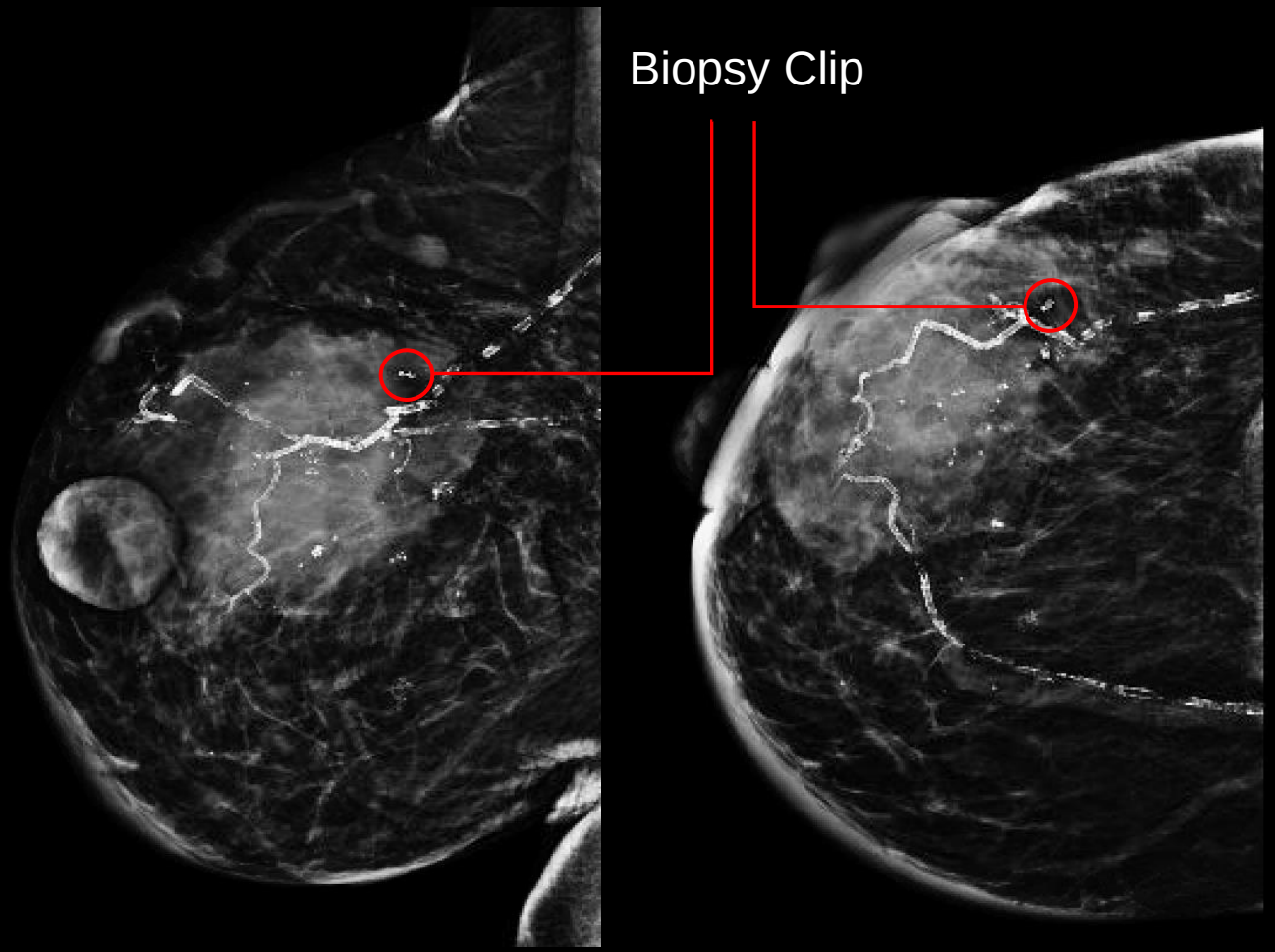
Differential Diagnosis (based on imaging)

1. Invasive Lobular Carcinoma
2. Metastatic Carcinoma
3. Inflammatory Carcinoma
4. Metaplastic Carcinoma

What should be done next?

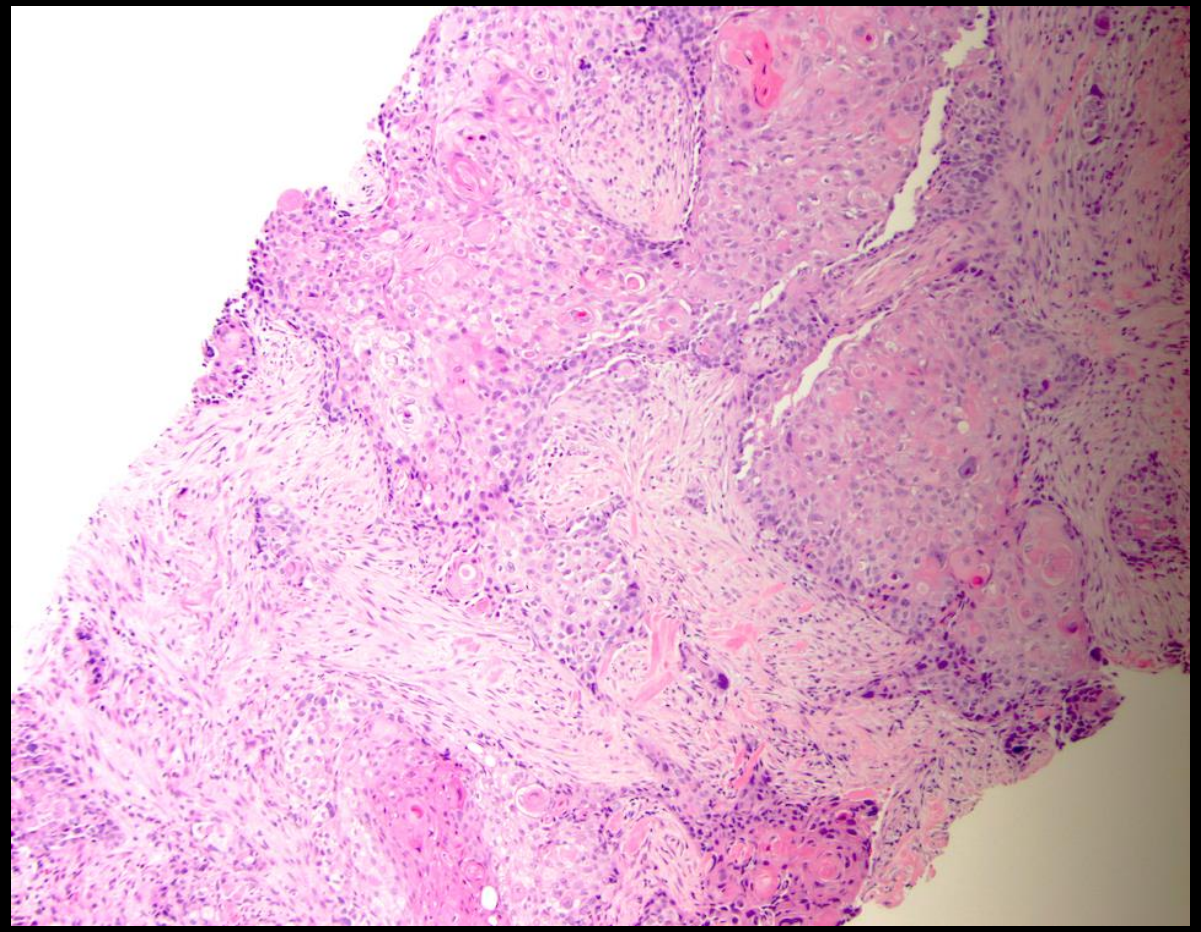
Ultrasound Guided Core Biopsy & Diagnostic Post Clip Mammogram

Biopsy site



Biopsy Clip

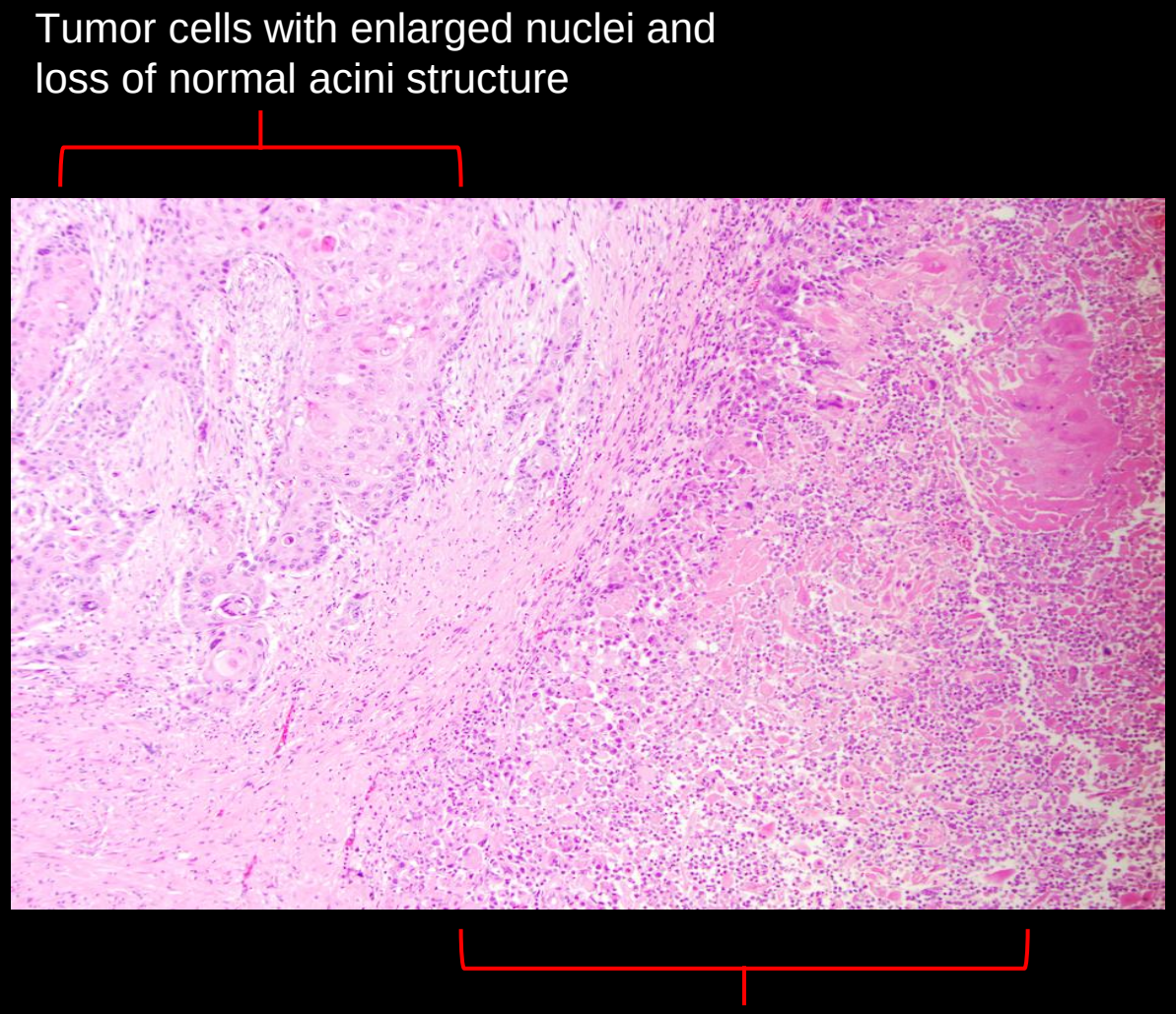
Micro Pathology (labeled)



H&E stain: Magnified view of core biopsy tissue showing tumor cells distributed in nests with keratinized pearls

Receptor testing: ER negative, PR negative, Her2 negative

Micro Pathology (labeled)



H&E stain: Magnified view of mastectomy tissue consistent with metaplastic carcinoma of the breast. The absence of dysplasia in skin adjacent to the tumor supports that this is a breast, not cutaneous, primary.

Final Diagnosis:

Metaplastic Breast Carcinoma (squamous type)

Metaplastic breast carcinoma (MpBC) is an uncommon type of neoplasia

- Accounts for less than 1% of breast carcinomas, and mostly appear in postmenopausal women[1]
- May appear sporadically or derive from preexistent lesions involving breast glandular and tubular structures (adenomyoepithelioma, complex sclerosing lesions, fibrocystic disease)[2]
- Usually appears as a palpable mass in the breast that grows rapidly and has high density on mammograms[3]
- Most tumors of the breast arise from epithelium; however, the epithelium can differentiate into mesenchymal tissue which is a process called metaplasia[3]
- Is typically associated with triple-negative breast cancer (TNBC) lacking ER, PR, and HER2 hormone receptors[4]

MpBC has several morphological categories that differ in clinical prognosis

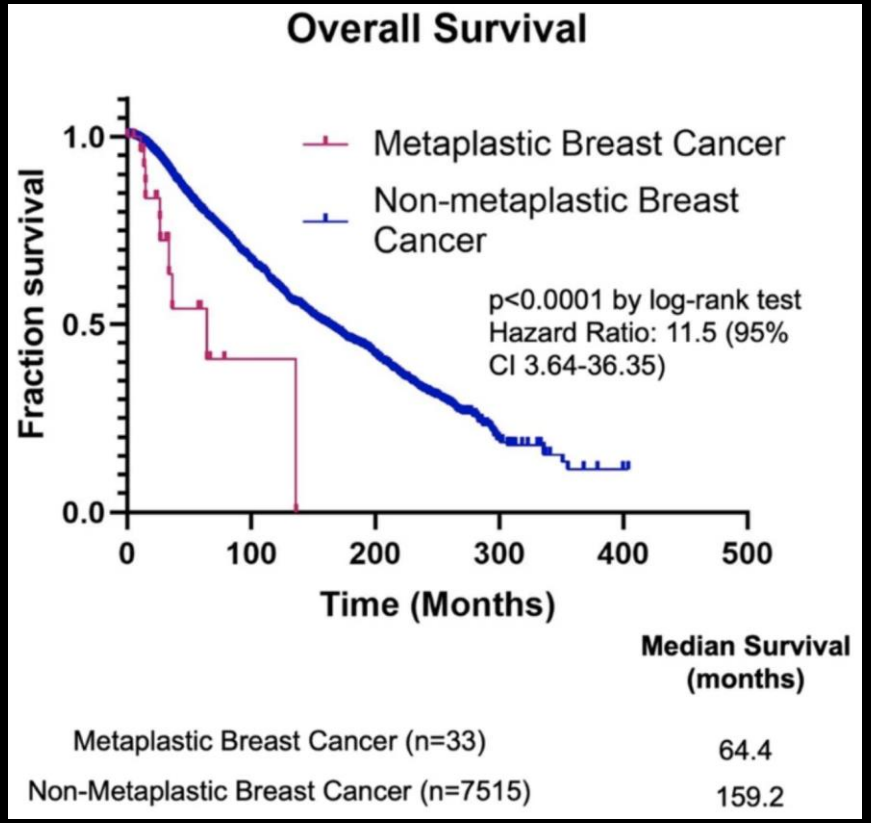
World Health Organization (WHO) classification system of MpBC based on histological organization[5]:

- low-grade adenosquamous carcinoma
- fibromatosis-like metaplastic carcinoma
- squamous cell carcinoma
- spindle cell carcinoma
- carcinoma with mesenchymal differentiation

All of these metaplastic variants are aggressive, chemoresistant, and have a high propensity to metastasize, with the exception of fibromatosis-like carcinoma and low-grade adenosquamous carcinoma[5]

With a widely variable oncology response, MpBC often requires a complex multidisciplinary treatment

- Due to the rarity and lack of homogeneity among MpBC tumor cells, a combination of conventional treatments including chemotherapy, surgery, and radiotherapy are often used[6,7]
- MpBC recurs more often and more quickly compared to invasive ductal carcinoma (IDC) and invasive lobular carcinoma (ILC), with a peak recurrence rate of 18 months to 3-5 years after treatment[6,7]
- The prognosis for MpBC is often poor because of the cancer's aggressive growth rate, high likelihood of metastasizing, and shorter disease-free and overall survival (OS) compared to non-metaplastic breast cancer[6,8]



(Reddy et al., 2020)

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