Biopsy results of new suspicious breast imaging findings in patients undergoing neoadjuvant chemotherapy for primary breast cancer

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Background & Purpose

- Interpreting new suspicious breast imaging findings after neoadjuvant chemotherapy (NAC) can be a challenge for radiologists [1]. These findings may represent post-treatment change, tumor progression, or even new development of malignancy.
- Confirmation via tissue biopsy is required to definitively determine the etiology of these new findings. This period of diagnostic uncertainty can cause additional anxiety in this subset of patients with a locally invasive breast cancer undergoing active treatment[1-2].
- We aimed to describe the outcomes (benign vs. malignant) of biopsies performed for new findings in patients actively undergoing neoadjuvant chemotherapy (NAC) for primary breast cancer.
- It was hypothesized that in patients whose primary breast tumor was responding to NAC on imaging, new suspicious findings on imaging were more likely to be benign on biopsy.

Materials & Methods

- After institutional review board (IRB) approval, a retrospective chart review of all patients who underwent neoadjuvant chemotherapy for primary breast cancer at a large academic medical center from 2013-2021 was performed.
- Patients were excluded if biopsies were not image-guided, were taken from the original primary tumor, or were taken from a lesion present on initial extent of disease imaging.
- Patients were also excluded if imaging was performed at an outside facility.

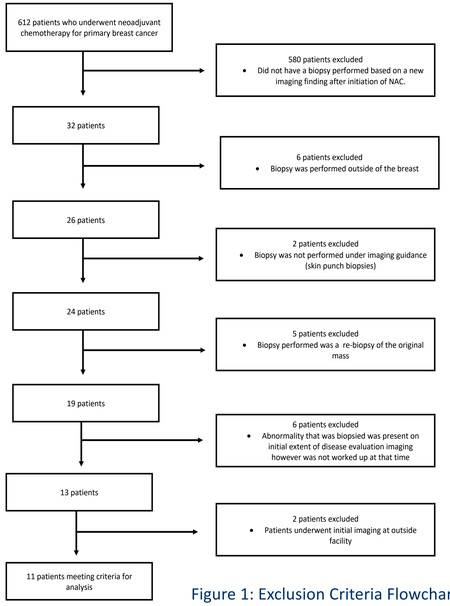

Figure 1: Exclusion Criteria Flowchart

Table 1: Summary of patients undergoing breast biopsy.
NAC = neoadjuvant chemotherapy; MR = magnetic resonance; US = ultrasound

Case	Age at Diagnosis (y)	TNM Staging (Clinical)	Response to NAC	Finding Modality	Time of Biopsy after NAC (days)	Laterality to Index Mass	Size of Abnormality (cm)	Modality of Biopsy	Biopsy Outcome
1	47	T2N0M0	Complete	MR	102	Ipsilateral	1.1 x 0.9 x 1.0	MR Guided	**Benign**
2	43	T2N0M0	Complete	US	62	Contralateral	1.7	US Guided	**Benign**
3	55	T2N1M0	Partial	MR	127	Contralateral	0.6	MR Guided	**Benign**
4	54	T2N0M0	Complete	Mammo	106	Ipsilateral	amorphous calcs	Stereo Guided	**Benign**
5	74	T0N1M0	Partial	Mammo	87	Ipsilateral	amorphous calcs	Stereo Guided	**Benign**
6	55	T2N0M0	Non-Response	MR	147	Contralateral	0.5	MR Guided	**Benign**
7	37	T2N1M0	Partial	MR	119	Contralateral	0.5	MR Guided	**Benign**
8	37	T3N0M0	Partial	MR	158	Contralateral	0.7	US Guided	**Benign**

Table 2: Summary of patients undergoing lymph node biopsy.
NAC = neoadjuvant chemotherapy; MR = magnetic resonance; US = ultrasound

Case	Age at Diagnosis (y)	TNM Staging (Clinical)	Response to NAC	Finding Modality	Time of Biopsy after NAC (days)	Laterality to Index Mass	Size of Abnormality (cm)	Modality of Biopsy	Biopsy Outcome
1	72	T2N0M0	Non-Response	US	101	Ipsilateral	1.6 x 1.2 x 1.1	US Guided	**Benign**
2	62	T3N1M0	Partial Response	MR	135	Contralateral	1.9	US Guided	**Benign**
3	44	T2N1M0	Partial Response	MR	106	Contralateral	1.7 x 1.3	US Guided	**Benign**

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Results

- Eleven patients with suspicious findings on MRI, ultrasound, or mammography were included for analysis.
- Of the 11 patients, image-guided biopsy of the breast (n = 8, 72%) or an axillary lymph node (n = 3, 28%) was performed on average 113.5 days after the initiation of NAC. All biopsies were taken prior to surgical resection of the primary tumor.
- All 8 patients who underwent breast biopsies of either the ipsilateral breast as the primary tumor (n = 3, 36%) or the contralateral breast (n=5, 63%) had pathological findings that were determined to be benign.
- Similarly, all 3 patients who underwent biopsy of an ipsilateral (n=1) or contralateral axillary lymph node (n=2) were found to have benign biopsy results.

Conclusions

Based on the findings of our study, image-guided biopsy of new suspicious findings on imaging of patients whose primary breast tumor is responding to NAC may not be as useful as previously thought and may cause unwarranted psychological stress.

References

1. LaRoy, J. R., Tadros, A. B., Sevilimedu, V., & Mango, V. L. (2023). A diagnostic dilemma: New enhancing suspicious findings on breast MRI following neoadjuvant chemotherapy. *Journal of Breast Imaging*, *5*(4), 453–458. https://doi.org/10.1093/jbi/wbad035
2. Lee, J. M., Lowry, K. P., Cott Chubiz, J. E., Swan, J. S., Motazedi, T., Halpern, E. F., Tosteson, A. N. A., Gazelle, G. S., & Donelan, K. (2020). Breast cancer risk, worry, and anxiety: Effect on patient perceptions of false-positive screening results. *The Breast*, *50*, 104–112. https://doi.org/10.1016/j.breast.2020.02.004