The Use of Contrast Enhanced Mammography for Noncalcified Ductal Carcinoma Insitu for the Breast: Pre Surgical Staging and Planning (Abstract #95)

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Introduction

Ductal carcinoma insitu is a noninvasive breast cancer with a more favorable prognosis that is typically identified as calcifications on mammography. Less commonly diagnosed and more difficult to detect is non-calcified ductal carcinoma insitu (NCDCIS). NCDCIS represents 10% of all DCIS and may present as a clinical lump or present on imaging as a mass (67%) focal asymmetry (24%) or architectural distortion (15%). The ability to detect NCDCIS is important for cancer staging and surgically planning in the effort to obtain negative margins at lumpectomy site. NCDCIS may not be detectable on diagnostic imaging as a structural abnormality and may only be discoverable with the use of contrast. Functional imaging with MRI or contrast enhanced mammography (CEM) typically shows NCDCIS as non-mass enhancement (NME). CEM is a strong alternative to MRI for cancer staging. Advantages of CEM over MRI include lower false positive rates, lower cost and greater patient acceptance. A few small retrospective studies have shown that CEM detects pure DCIS and mixed DCIS and invasive disease, but there has not been a focus on NCDCIS. The purpose of our study is to evaluate the imaging and pathology of NCDCIS cases.

Table 1. Patient Demographics

Demographics	Volume
Total Exams	3624
Total Patients	3428
Average age (Range)	51.5 (20-87)
Non-dense breasts	1178 (33%)
Dense breasts	2445 (67%)

Table 2. Characteristics of cases

Cancer Type	Volume
Invasive Ductal Carcinoma	61% (408/668)
Invasive Lobular Carcinoma	10% (64/668)
Mixed Lobular/Ductal Carcinoma	3% (19/668)
Ductal Carcinoma Insitu	19% (130/668)
Non-Calcified Ductal Carcinoma Insitu	3% (16/668)
Other	7% (47/668)

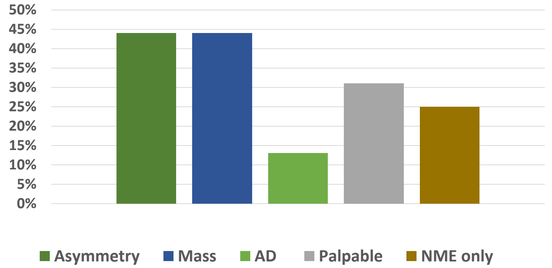
Methods and Materials

This retrospective study included 3624 Hologic CEM exams, including 668 cancers and 2956 noncancers in 3428 patients. The exams were interpreted by one of 15 MQSA certified Radiologists across two clinical sites from June 19, 2018 to December 31, 2024. The age of women ranged from 20 to 87 with median age of 51.5. Dense breast tissue identified in 67% (2445/3624) and 33% (1178/3624) were non-dense, 1 patient was not evaluated for breast density due to post bilateral mastectomy. All cancer cases are biopsy proven and included in the study. The CEM exams were performed either pre or post biopsy. All exams included age, breast density, and histopathology results for biopsy cases from the medical record. Within the set of NCDCIS cases, image findings on the mammogram, patient reported symptoms and contrast enhancement types were obtained. The study assesses the overall prevalence of NCDCIS in the set of cancers and demonstrates the imaging and pathological findings with the addition of contrast to the standard mammogram.

Results

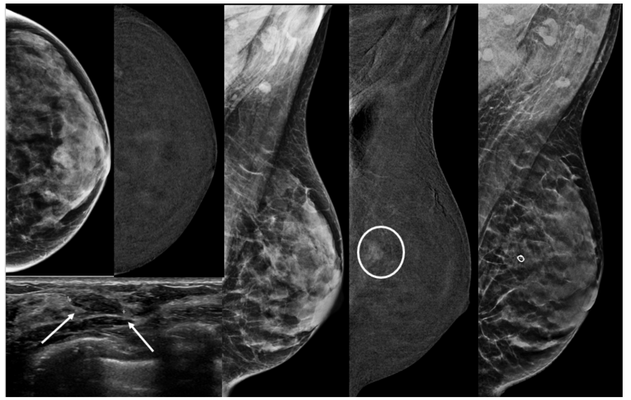
In the set of 668 patients with a diagnosis of cancer, 408 were invasive ductal carcinoma, 64 invasive lobular carcinoma, 19 mixed ductal and insitu and 130 ductal carcinoma insitu. Of the 130 DCIS, 16 of the CEM exams identified NCDCIS. The overall prevalence of NCDCIS in the set of cancer cases is 3% (16/668) and 12% (16/130) of the DCIS cases. Age range was 37 to 75 with median age of 49 and 69% (11/16) of women had dense breast tissue. Mammographic findings include asymmetry (7), mass (7), architectural distortion (2). Four of the 16 (25%) cases were non-mass enhancement and mammographically occult and five of the 15 (31%) were palpable.

Chart 1. Characteristics of NCDCIS cases

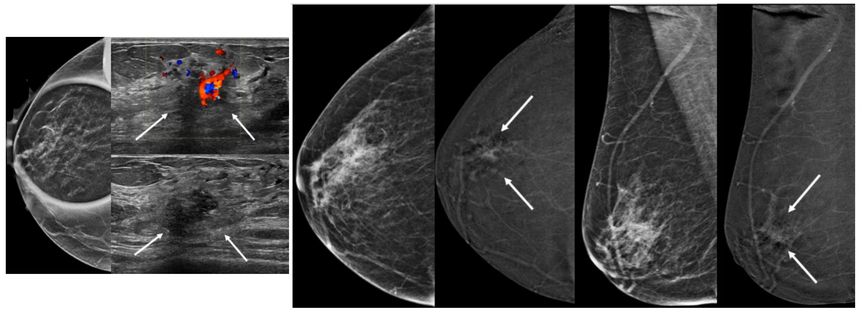


Conclusions

NCDCIS can be difficult to detect on pre-surgical imaging and may result in positive margins at lumpectomy. Contrast enhanced mammography has the ability to show NCDCIS as enhancement, even without an underlying structural abnormality such as a mass or architectural distortion. The use of CEM for cancer staging can assist breast surgeons by showing extent of disease and has the potential to perform at the level of MRI. .



Case 1. 42-year-old woman with extremely dense breast tissue presents for 6 month follow up for a stable benign right asymmetry. Contrast enhanced mammogram noted low grade enhancement at 3 o'clock 6 cm from nipple without focal mass on tomosynthesis. Ultrasound correlate, 1.1 cm oval area with indistinct margin. Ultrasound biopsy recommended with result of non-calcified ductal carcinoma insitu.



Case 2. 68-year-old woman with heterogeneously dense breast tissue presents with a palpable mass in right breast. Diagnostic mammogram identified an architectural distortion mid central breast on CC views only. Ultrasound identified a 1.4 cm irregular area with indistinct margins and vascularity at 9 o'clock 2 cm from nipple. Contrast enhanced mammogram recommended prior to biopsy. Contrast enhanced mammogram noted 3.9 cm x 3.0 cm x 3.2 cm area of enhancement, greater in size than ultrasound images. Ultrasound biopsy recommended with result of non-calcified ductal carcinoma insitu.

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References

1. Chueng Y, Juan Y, Lin Y, Lo Y, Tsal H, Ueng S, Chen S. Dual Energy Contrast Enhanced Spectral Mammography: Enhancement Analysis on BI-RADS 4 Non-Mass Microcalcifications in Screen Women. PLoS ONE 11(9): e0162740. doi:10.1371/journal.pone.0162740

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