Mammographic calcifications in LCIS: A role in future breast cancer risk?

Nyante SJ, Epps C, Jordan SG, Wang T, Ozdowski EF, Tan X, Zhu A, Lawton TJ

Background

- Lobular carcinoma *in situ* (LCIS) is a noninvasive breast lesion

- LCIS is a strong risk factor for a future breast cancer diagnosis, with a relative risk of 8 to 12

- Mammographic calcifications are common in LCIS patients and can be classified according to morphology and distribution

- Certain types of calcifications are associated with poorer survival and poor prognostic features among women with breast cancer

- It is unclear if calcifications are useful for predicting outcomes among women with LCIS

Objective

To explore the potential prognostic significance of mammographic calcifications among women diagnosed with LCIS.

Methods

- Population included 49 women diagnosed with LCIS at a single institution between 2007 and 2014

- No ipsilateral breast cancer

- Mammogram within 2 years of LCIS diagnosis

- Patients were followed for ipsilateral breast cancer incidence (median follow-up of 5.6 years)

Results

Table 1. Morphology and distribution of mammographic calcifications present in 49 cases of LCIS without breast cancer.

Calcification Descriptor	Classified as suspicious?	N[a] (%)
Morphology		
Amorphous	Yes	32 (41)
Round		19 (24)
Fine pleomorphic	Yes	7 (9)
Rim		6 (8)
Coarse		5 (6)
Coarse heterogeneous	Yes	5 (6)
Vascular		3 (4)
Fine linear/fine linear branching	Yes	1 (1)
Milk of calcium		1 (1)
Distribution		
Grouped	Yes	36 (60)
Diffuse		15 (25)
Regional	Yes	5 (8)
Segmental	Yes	3 (5)
Linear	Yes	1 (2)

[a]Counts include all observed calcifications. Some women had more than one calcification type.

Table 2. Association between suspicious calcifications and LCIS histopathologic characteristics among 49 women diagnosed with LCIS without breast cancer.

Characteristic	Suspicious Calcifications?		
	Yes N (%)	No[a] N (%)	P-value
LCIS-associated calcifications			
No	27 (68)	6 (67)	0.96
Yes	13 (33)	3 (33)	
# lobules involved with LCIS			
1 to 5	16 (41)	5 (56)	0.70
6 to 10	8 (21)	1 (11)	
>10	15 (38)	3 (33)	
Missing	1		
Atypical lobular hyperplasia present			
No	14 (35)	3 (33)	0.92
Yes	26 (65)	6 (67)	
Atypical ductal hyperplasia present			
No	26 (65)	7 (78)	0.47
Yes	14 (35)	2 (22)	

[a]Includes cases with calcifications classified as typically benign and cases without calcifications.

Results

- 43 of 49 cases (88%) had calcifications (**Table 1**)
  - Multiple morphologies - 45%
  - Multiple distributions - 28%

- 40 of 49 cases (82%) had ≥1 instance of suspicious calcifications

- No differences in LCIS histologic characteristics among women with vs. without suspicious calcifications (**Table 2**)

- 3 women were diagnosed with ipsilateral invasive breast cancer during follow-up – 100% had suspicious calcifications at the time of LCIS diagnosis
  - Amorphous and fine pleomorphic morphologies
  - Grouped and regional distributions

Methods (continued)

- Calcification morphology and distribution were evaluated prospectively by a single radiologist

- Calcifications were classified as suspicious for malignancy, based on American College of Radiology BI-RADS® guidance

- LCIS histologic characteristics were evaluated prospectively by a single pathologist

- Associations between suspicious calcifications and LCIS characteristics were estimated using generalized linear models

Conclusions

- In this exploratory study, calcifications classified as suspicious for malignancy were common.

- The presence of suspicious calcifications was not associated with LCIS characteristics.

- All three invasive breast cancers arose among patients who had suspicious calcifications. Although suggestive, the high prevalence of suspicious calcifications makes it difficult to determine whether this was due to anything other than chance.

- Studies with a greater number of breast cancer events and detailed radiologic and chemical characterization of calcifications are needed to disentangle the contributions of multiple calcification types to breast cancer risk among LCIS patients.