



Radial scar/complex sclerosing lesions: a clinicopathologic correlation study from a single institution ☆,☆☆

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ABSTRACT

Radial scars (RSs) or complex sclerosing lesions (CSLs) of the breast are benign radiologic and histologic entities. With the introduction of population-based screening programs, their incidence has increased to 0.03% to 0.09% of all core needle biopsies (CNBs). They can pose diagnostic difficulty because their radiologic and histologic appearances mimic carcinoma. We retrospectively searched for and reviewed all cases of RS/CSL diagnosed on image-guided CNB from January 1, 1994, to August 31, 2013, at a single institution. We also assessed the pathologic reports from excisional biopsies to identify cases upstaged to atypia or neoplasm. After exclusions, 100 CNBs were identified from 97 women, which showed RS/CSL without concomitant atypia. Mean age of the women was 52.9 years. Thirty-five women (38/100 CNBs, 38%) had follow-up excision. The median size of the excised RS/CSLs was 1.2 cm; 69% were larger than 1.0 cm. Almost all excised cases (92%) showed radiologic and pathologic concordance, and 79% were designated as suspicious for malignancy (Breast Imaging Reporting and Data System level 4). The most common findings of 38 follow-up excisional biopsies were residual RS (22 [58%]), atypical lobular hyperplasia (5 [13%]), and no residual lesion (5 [13%]). Eleven excisional biopsies (29%) were upstaged to invasive or in situ carcinoma or to atypical hyperplasia. Follow-up excisional biopsy is warranted for RS/CSLs, specifically those larger than 1.0 cm with worrisome radiographic findings or with radiologic and pathologic discordance. Approximately 29% of cases were upstaged to in situ or invasive carcinomas or other high-risk lesions in our study.

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1. Introduction

A radial scar (RS) or complex sclerosing lesion (CSL) is a pathologic entity characterized by a fibroelastotic core with entrapped ducts [1]. Radiologically, it has a radiolucent central core and radiating spicules; it is indistinguishable from invasive carcinoma both mammographically and histopathologically [2,3]. It may be associated with atypical and typical usual epithelial hyperplasia, adenosis, papillomatosis, ductal carcinoma in situ (DCIS), or even invasive carcinoma within or adjacent to RS [2,4].

The incidence of RS is reported as 0.03% to 0.07% [5]. The pathogenesis of RS is uncertain. Reaction to an unknown trauma, which results in scarring with elastosis or inflammation, has been hypothesized [3]. It has been suggested that RS is a premalignant lesion for the development

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of breast cancer (BC), but coexistent proliferative epithelial lesions have also been proposed to be the underlying causative factors for BC [6,7].

Some groups advocate that all RSs diagnosed on core needle biopsy (CNB) should be excised [2,5,8–13], whereas others do not support surgical excision [14–18]. This study was initiated to characterize RSs and CSLs diagnosed at a single medical center and to define the clinical, mammographic, and histopathologic characteristics in correlation with performance of and findings on follow-up excisional biopsies.

2. Materials and methods

Institutional review board approval was obtained to perform the study. We retrospectively searched our anatomical pathology database for the records of patients with a diagnosis of RS or CSL made from CNB findings at our academic medical center between January 1, 1994, and August 31, 2013. We also identified those who had excisional biopsy of the RS/CSL. Cases were excluded if the pathologic diagnosis from CNB was RS/CSL associated with atypical epithelial hyperplasia, lobular neoplasia, DCIS, or malignancy. Patient demographic and clinical characteristics were retrieved from the hospital records. All CNB and excisional biopsy specimens as well as radiologic images were retrieved

Table 1
Patients' clinical and lesion pathologic characteristics

Characteristic	Total (N = 100) ^a	RS/CSL CNBs		P
		No excision (n = 62)	Excision (n = 38) ^b	
Age at CNB, y	52.9 (11.9)	54.6 (11.7)	50.2 (11.8)	.07 ^c
Oral contraceptive use	44/75 (59)	24/41 (59)	20/34 (59)	.98 ^d
Lesion presentation	n = 96	n = 62	n = 34	.05 ^e
Mammographic screening	70 (73)	51 (82)	19 (56)	
Palpable mass	11 (12)	5 (8)	6 (18)	
Focal breast pain	3 (3)	1 (2)	2 (6)	
Screening MRI	6 (6)	2 (3)	4 (12)	
Other	6 (6)	3 (5)	3 (9)	
Imaging method for RS/CSL measurement	n = 93	n = 58	n = 35	NA
MBI	1 (1)	0 (0)	1 (3)	
MRI	12 (13)	4 (7)	8 (23)	
Mammography	30 (32)	26 (45)	4 (11)	
Ultrasonography	50 (54)	28 (48)	22 (63)	
Mammography findings	n = 89	n = 57	n = 32	NA
Architectural distortion + calcifications	12 (14)	5 (9)	7 (22)	
Architectural distortion	19 (21)	9 (16)	10 (31)	
Calcifications	26 (29)	21 (37)	5 (16)	
Mass	6 (7)	6 (11)	0 (0)	
Mass with calcifications	1 (1)	1 (2)	0 (0)	
Mass with distortion	7 (8)	4 (7)	3 (9)	
Occult	14 (16)	8 (14)	6 (19)	
Other	4 (5)	3 (5)	1 (3)	
BI-RADS level	n = 30	n = 1	n = 29	NA
3 (probably benign)	5 (17)	0 (0)	5 (17)	
4 (suspicious)	24 (80)	1 (100)	23 (79)	
5 (highly suggestive of malignancy)	1 (3)	0 (0)	1 (3)	
Ultrasonography findings	n = 70	n = 37	n = 33	NA
Hypoechoic area	9 (13)	4 (11)	5 (15)	
Hypoechoic area with shadowing	12 (17)	5 (14)	7 (21)	
Isoechoic/hyperechoic	1 (1)	1 (3)	0 (0)	
Mass with no shadowing	23 (33)	13 (35)	10 (30)	
Mass with shadowing	13 (19)	6 (16)	7 (21)	
Occult	10 (14)	6 (16)	4 (12)	
Other	2 (3)	2 (5)	0 (0)	
MRI findings	n = 16	n = 6	n = 10	NA
Enhancing mass	8 (50)	1 (17)	7 (70)	
Nonmass enhancement	4 (25)	3 (50)	1 (10)	
Occult	3 (19)	2 (33)	1 (10)	
Other	1 (6)	0 (0)	1 (10)	
MBI findings	n = 11	n = 2	n = 9	NA
Mass moderate uptake	1 (9)	0 (0)	1 (11)	
Mass shadowing	1 (9)	0 (0)	1 (11)	
Nonmass marked uptake	1 (9)	0 (0)	1 (11)	
Nonmass mild uptake	1 (9)	1 (50)	0 (0)	
Nonmass moderate uptake	3 (27)	1 (50)	2 (22)	
Occult	4 (36)	0 (0)	4 (44)	
Laterality	n = 34	ND	n = 34	
Left	19 (56)		19 (56)	
Right	15 (44)		15 (44)	
Lesion size, cm	1.1 (0.6-1.6) (n = 93)	0.9 (0.5-1.5) (n = 58)	1.2 (0.7-1.7) (n = 35)	.04 ^f
CNB needle gauge	n = 95	n = 59	n = 36	<.001 ^f
9 ^g	20 (21)	17 (29)	3 (8)	
11	28 (30)	22 (37)	6 (17)	
14	41 (43)	16 (27)	25 (69)	
16	6 (6)	4 (7)	2 (6)	
No. of cores	n = 93	n = 57	n = 36	.60 ^d
≤4	18 (19)	12 (21)	6 (17)	
>4	75 (81)	45 (79)	30 (83)	

Values are expressed as mean (SD), number of patients (%), number of patients/number with data available (%), or median (interquartile range). Abbreviations: MBI, molecular breast imaging; MRI, magnetic resonance imaging; NA, not analyzed; ND, no data available.

^a In 97 women.

^b In 35 women.

^c Unequal variance *t* test.

^d χ^2 Test.

^e Fisher exact test.

^f Wilcoxon rank sum test.

^g Gauges 1 and 2 combined with 9.

and re-evaluated by 2 pathologists (BC and AN) and a radiologist (ALC), respectively.

Radiologic results of ultrasonography, mammography, and magnetic resonance imaging were captured and evaluated with the Breast

Imaging Reporting and Data System (BI-RADS) score. Size of the mass was noted from the radiology report, with RS defined as a mass of 1.0 cm or smaller and CSL defined as a mass larger than 1.0 cm. The needle gauge and number of cores obtained during sampling

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