Original Article

Cellular fibroadenoma on Core needle biopsy: management recommendations for the radiologist

Teresa Edwards [a], Shabnam Jaffer [b], Janet R. Szabo [a], Emily B. Sonnenblick [a], Laurie R. Margolies [a,*]

[a] Department of Radiology, Icahn School of Medicine at Mount Sinai
[b] Department of Pathology, Icahn School of Medicine at Mount Sinai

ABSTRACT

Introduction: Cellular fibroadenomas (CFA) are difficult to distinguish from phyllodes tumor (PT) at biopsy. This study's purpose was to determine what CFA characteristics were associated with recommendations to follow-up or excise and if the current algorithm was correct.
Materials and methods: Databases from 2002 to 2014 were reviewed. Mass characteristics and post biopsy recommendations were recorded.
Results: 81 CFAs were diagnosed; 19 cellular and 62 with slightly cellular stroma. 21 masses were surgically excised with 2 PTs diagnosed.
Conclusion: Larger mass size and increased histologic cellularity were associated with excision recommendation, but only clinical growth was associated with PT.

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1. Introduction

Fibroadenoma (FA) of the breast is the most common benign breast tumor in adolescent girls and young woman with a peak incidence during the second and third decades of life [1]. FAs are fibroepithelial lesions (FEL) composed of an epithelial and stromal component. FA can be safely managed with follow-up imaging when diagnosed by a concordant core needle biopsy. However, a rare subset of FAs displays increased stromal cellularity and are cellular or slightly cellular fibroadenomas (CFAs) that can be difficult to distinguish from phyllodes tumor (PT) [2,3,4,5]. PTs are rare, accounting for<1% of mammary tumors, occur most frequently in woman during the fifth decade of life, and can locally re-occur following surgical excision [1,6]. The distinction between CFAs and PT is important as the clinical management of these two entities differ.

Fibroadenomas are readily diagnosed on core biopsy by pathologists due to their typical balanced proliferation composition of glands and stroma, which is usually relatively consistent throughout the lesion. There may be variations in the stroma, such that it may become more cellular, making it difficult to distinguish a CFA from a PT. Criteria for

distinguishing fibroadenomas from PT include leaf like projections, periductal stromal condensation, invasive borders, necrosis, the presence of atypia, increased cellularity and overgrowth of the stroma [2,7]. These same features are also used in subdividing phyllodes tumor into benign, borderline and malignant. The latter's obvious malignant features such as atypia, mitoses and hypercellular stroma may be easily recognized and diagnosed on core biopsy [7]. On the other hand, distinguishing a benign PT from a CFA can be quite challenging on limited core biopsy material due to subtle overlapping features. PT may occupy only a portion of a CFA making sampling error an issue in distinguishing the 2 entities. In these circumstances, the pathologist may resort to a broad diagnosis of "fibroepithelial lesion with cellular stroma." This term is a subjective one, since there are no formally established criteria for what qualifies as a CFA [7] other than those described in one study [2]. Hartzog et al. subdivide the stromal cellularity into mildly, moderately and markedly increased. Mildly increased is defined as stromal cellularity that was twice that of the normal perilobular stroma; markedly cellular was defined as confluent areas such that the stromal cells touch one another, whereas moderate was between these two. However, these distinctions are mostly of academic interest and have not been incorporated into daily practice.

There are currently no definitive guidelines for the management of CFA. FAs diagnosed by core needle biopsy have been upgraded to PTs following surgical excision :1.2% in a series of 426 fibroadenomas [8]. Because of this, surgical excision has been recommended for complete histologic evaluation for FELs with increased cellular stroma diagnosed by core needle biopsy [2]. At our institution, both imaging follow-up

Table 1
Imaging characteristics of the 81 masses that yielded cellular fibroadenomas on core needle biopsy.

Mass Characteristics							
Shape	No. (%)	Margin	No. (%)	Echogenicity	No. (%)	Orientation	No. (%)
Oval	72 (88.9)	Circumscribed	61 (75.3)	Hypoechoic	57 (71.25%)	Parallel	72 (90.0%)
Round	3 (3.7%)	Indistinct	6 (7.4%)	Heterogeneous	14 (17.5%)	Not parallel	4 (5.0%)
Irregular	2 (2.5%)	Microlobulated	6 (7.4%)	Isoechoic	4 (5.0%)		4 (5.0%)
	4 (4.9%)	Angular	4 (4.9%)	Complex	1 (1.25%)		
			4 (4.9%)		4 (5.0%)		
Total	81 (100%)		81 (99.9%)		80 (100%)		80 (100%)

and surgical excision have been recommended for biopsies yielding a CFA without clear guidelines for which recommendation was made. The purpose of this study was to review the CFAs diagnosed on core needle biopsy, determine what characteristics were associated with recommendations of follow-up versus surgical excision and correlate image findings with ultimate outcome in an attempt to begin to develop practice guidelines for the management of CFA.

2. Materials and methods

Institutional review board approval was obtained and informed consent was waived for this study. Two databases were accessed to identify core needle breast biopsies that yielded a diagnosis of CFAs from 2002 to 2014: the radiology reporting information system (RIS) and the pathology database. All information was obtained from pathology reports, radiology reports or images. Pathologists with specialized breast training divided the CFA into 2 categories: "cellular" (CNOS) or "slightly cellular" (SCFA). These categories correspond to "markedly cellular" and "mildly increased" cellularity as defined by Hartzog et al. They also paid attention to the ratio of stroma to glandular epithelium which maybe increased more than ten-fold in cellular fibroepithelial lesions.

The patients' imaging reports and clinical records were reviewed for the following information: patient age, clinical presentation of the biopsied mass, mass size and follow-up recommendations. The characteristics of the biopsied masses were documented including the mass shape and margin as well as echogenicity and orientation for masses identified and biopsied with ultrasound guidance [9]. The images were reviewed by one of the authors (TE) when the reports did not contain complete information.

If follow-up imaging was performed, the mass' maximum dimension was recorded and if the mass was surgically excised, final pathology was documented. Significant growth of the biopsied mass during follow-up imaging was defined as an increase of 20% in maximal dimension over six months [10].

3. Results

From 2002 to 2014 6951 fibroadenomas were diagnosed at our institution. A total of 81 CFAs were diagnosed in 80 patients by core needle biopsy during this period for a total percentage of 1.2% of biopsy proven fibroadenomas. Nineteen of these 81 masses were defined as cellular (CNOS) (23.5%) and 62 were defined as slightly cellular (SCFA)(76.5%). The patient ages ranged from 12–61; although not statically significant patients diagnosed with CNOS were younger with an average age of 32.7 years compared to an average age of 35.2 years for patients diagnosed with SCFA. The most common clinical presentation proceeding biopsy was a palpable mass in 45 of 81 patients (55.6%). Thirty-five patients had no clinical symptoms (43.2%) and 1 patient presented with pain (1.2%).

All image guided core needle biopsies that yielded CFAs were targeting masses – not calcifications or asymmetries. 80 masses were visualized and biopsied under ultrasound guidance. One mass was seen on mammogram, but was without a sonographic correlate necessitating stereotactic biopsy. The average mass size was 1.8 cm for both CNOS and SCFA, with a range from 0.5 to 6 cm. Four ultrasound exams were unable to be retrieved from electronic storage and their mass imaging characteristics could not be fully assessed. The descriptors for the remaining biopsied masses are summarized in Table 1. The most common mass shape was oval (88.9%), and the most common margin was circumscribed (75.3%). Most masses were hypoechoic (71.3%), and most had a parallel orientation (90.0%).

Following core needle biopsy, 6 month follow-up imaging was recommended for 51 patients (63%) and surgical consultation for excision was recommended for 30 patients (37%). The 51 patients recommended for follow-up had an average mass size of 1.6 cm, and an average age of
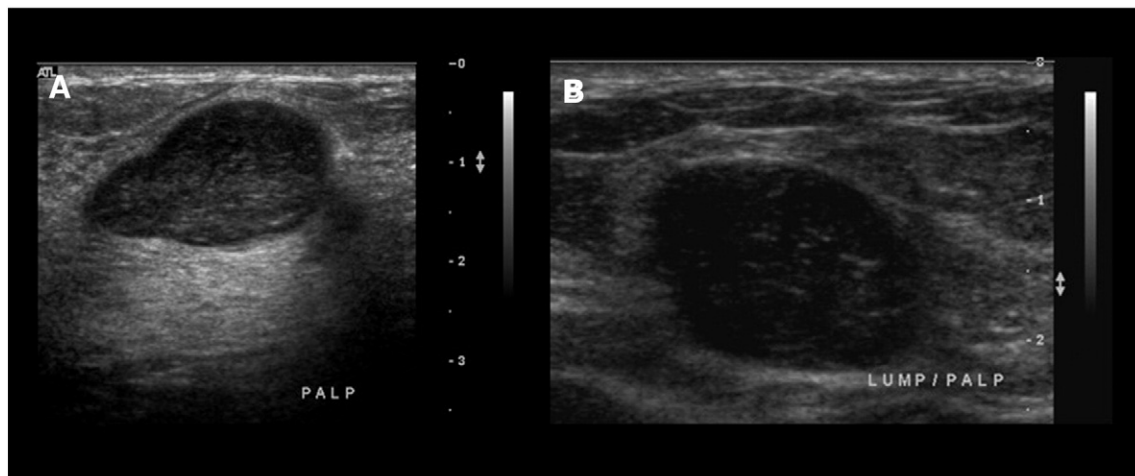

Fig. 1. Two oval, circumscribed, parallel, hypoechoic masses that were cellular fibroadenomas on core needle biopsy and benign phyllodes tumors at time of surgical excision. **A:** This patient reported a palpable mass that was rapidly enlarging. **B:** This patient also reported a palpable mass.