Core Needle Biopsy of the Breast

An Evaluation of Contemporary Data

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KEYWORDS

• Atypical ductal hyperplasia • Atypical lobular hyperplasia • Lobular carcinoma in situ
• Lobular neoplasia • Flat epithelial atypia • Radial scar • Papilloma

Key points

- Most patients with atypical breast lesions diagnosed on core biopsy are referred for immediate surgical excision.
- Recent studies indicate that, for many of these lesions, the rate of upgrade to carcinoma may be lower than initially reported in studies that lacked radiologic-pathologic correlation.
- Careful clinical-pathologic and radiological–pathologic correlation may identify subsets for whom excision is not required.

ABSTRACT

Benign and atypical lesions associated with breast cancer risk are often encountered in core needle biopsies (CNBs) of the breast. For these lesions, the rate of "upgrade" to carcinoma in excision specimens varies widely in the literature. Many CNB studies are limited by a lack of radiological–pathological correlation, consistent criteria for excision, and clinical follow-up for patients who forego excision. This article highlights contemporary diagnostic criteria and outcome data that would support an evidence-based approach to the management of these nonmalignant lesions of the breast diagnosed on CNB.

OVERVIEW: SCREENING AND DETECTION

Changes in imaging techniques for breast cancer screening and diagnosis have had an impact on the types of specimens in which pathologists encounter risk-associated lesions. In the past 2 decades, it has become much more common for atypical ductal hyperplasia (ADH) and atypical lobular hyperplasia (ALH) to be diagnosed on core needle biopsy (CNB) versus an excisional biopsy.[1] The widespread adoption of digital mammography has resulted in more CNBs for microcalcifications with more diagnoses of columnar cell lesions and ADH.[2] Digital breast tomosynthesis appears to identify more atypical lesions and radial scars, including some that are occult on conventional digital mammography.[3,4]

In the largest case-control studies of open biopsies, atypical hyperplasia (ADH and ALH), flat epithelial atypia (FEA), papillomas, and radial scars were identified in approximately 4%, 2%, 5% to 6%, and 5% to 9%, respectively[5–12] The frequency of atypical hyperplasia in CNBs also appears to be approximately 4%.[13,14] In vacuum-assisted stereotactic CNBs specifically, the frequency of ADH, and ALH and lobular carcinoma in situ (LCIS) may be as high as 10% to 15%.[15–17] FEA and benign papillomas

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appear to account for 1% and 2% to 3% of CNBs, respectively.[14,18,19] The frequency of radial scars in recent studies of CNBs is approximately 1% to 2%.[14,20,21] If an estimated 1.5 million image-guided CNBs are performed annually in the United States[22] and 8% contain ADH, ALH, LCIS, FEA, or a radial scar,[14] approximately 120,000 women could be referred for surgical excision for these diagnoses each year.

In the vast majority of cases, risk-associated lesions cannot be recognized grossly. The discussion in this article focuses on the assessment of microscopic features, the selected application of immunohistochemistry, and the risk of carcinoma associated with these lesions when diagnosed on CNB.

ATYPICAL DUCTAL HYPERPLASIA

The definition of ADH is essentially based on a histologic comparison to ductal carcinoma in situ (DCIS) and is discussed in full in the article on the low-grade breast neoplasia pathway by Laura C. Collins's article, "Precursor Lesions of the Low Grade Breast Neoplasia Pathway," elsewhere in this issue. ADH fulfills some, but not all, of the criteria for a diagnosis of low-grade DCIS (**Fig. 1**).[5] A combination of cytologic and architectural features are required for the diagnosis of ADH,[23] whereas cytologic (nuclear) atypia alone may satisfy criteria for a diagnosis of FEA (discussed later in this article).[24]

In CNBs with borderline features of ADH versus low-grade DCIS, many experts recommend reporting the CNB as ADH or "atypical intraductal proliferative lesion" and referral for an excisional biopsy for further evaluation, rather than diagnosing low-grade DCIS before more thorough examination of the area with the imaging abnormality.[25,26] A conservative approach to the diagnosis of low-grade DCIS on CNB may mitigate overtreatment (eg, mastectomy or even bilateral mastectomy) in cases with atypia of limited extent on the CNB and no carcinoma in the excision specimen.

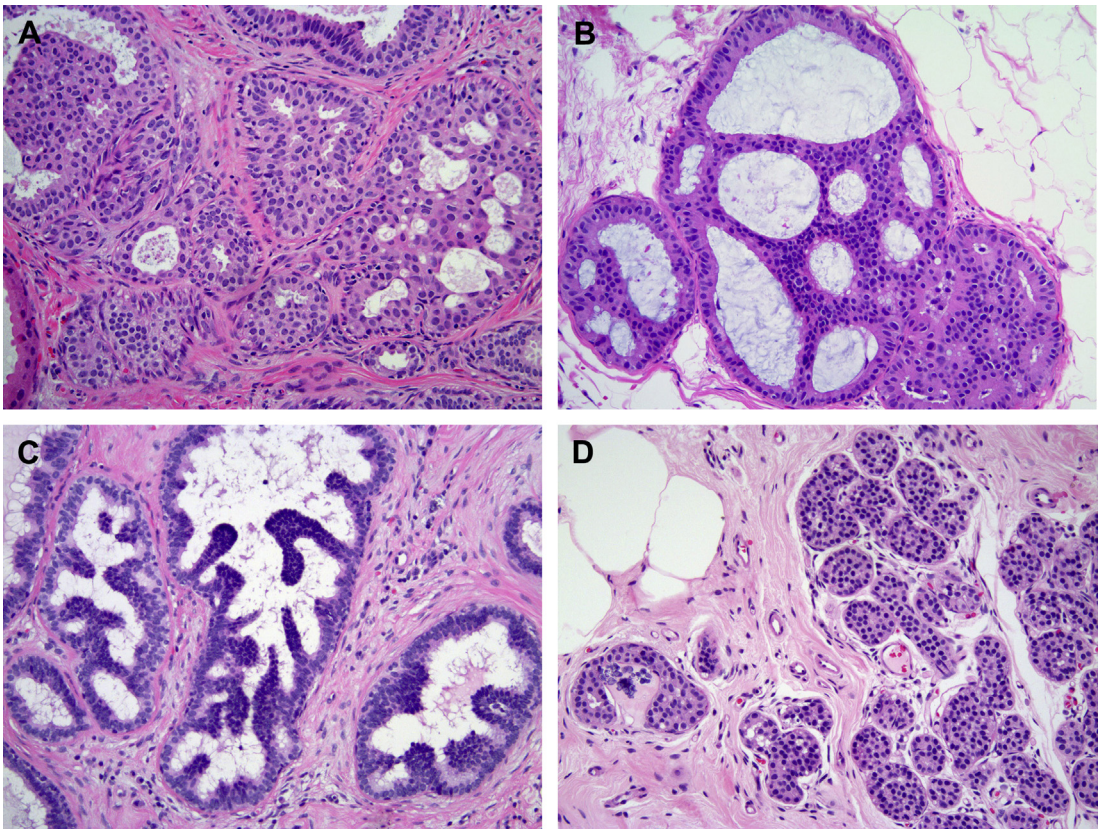

Fig. 1. Representative images of UDH (*A*), ADH with a cribriform pattern (*B*), ADH with a micropapillary pattern (*C*), and ALH with microcalcifications (*D*). H&E, original magnification ×200 (*A–D*).