

FNA IN THE DIAGNOSIS OF BREAST MASSES

Breast masses can be a diagnostic dilemma in clinical medicine. Because of the possibility of cancer, breast masses are usually excised, particularly masses presenting in older patients. It has been estimated that between 500,000 and 1.5 million (or more) surgical breast biopsies are performed annually in the US. The vast majority (approximately 80%) are benign.

Breast masses can present as a palpable discrete mass, a palpable area of asymmetric thickening, or can be a non-palpable lesion visible only on an imaging procedure (usually ultrasound or mammography). Both palpable and non-palpable masses need to be investigated, although the diagnostic approach differs.

Fine needle aspiration biopsy (FNA) can be used as a first-line investigative procedure in the evaluation of a palpable breast mass or non-palpable mass visible with ultrasound. The main purpose of FNA of breast masses is to confirm cancer preoperatively, and to avoid unnecessary surgery in specific benign conditions.

Palpable Masses

Any palpable mass or thickening in the breast that is of concern to the patient or physician should be considered for FNA biopsy. In particular, any lump in the breast found by the patient must be carefully investigated. Most palpable breast cancers (up to 90%) are first detected by the patient. Therefore, when examining a patient, it is very important to ask if she has found any abnormalities and pay particular attention to masses found by the patient, no matter how small the mass may be.

Non-Palpable Masses

Masses or calcifications found by imaging procedures need to be evaluated as recommended by the radiologist. Fine needle aspiration biopsy can be used to sample mass lesions that can be visualized by ultrasound. When the lesion is composed of microcalcifications, and can be visualized only by mammography, the patient needs to be referred for stereotactic core needle biopsy or needle localization with excisional biopsy.

Simple Cysts

Frequently, a breast mass is caused by a simple, fluid filled cyst. The vast majority of simple cysts are benign. Nevertheless, cystic masses often are tender and therefore provoke particular anxiety for the patient. FNA is effective in draining the cyst so that the mass resolves as well as eliminating the pain. In our experience, the vast majority of cysts do not recur.

Complex Cysts

Complex cysts can be recognized by their ultrasound characteristics with the cystic fluid containing septations or cellular debris that may be inflammatory cells or malignancy. The majority of complex cysts are benign, but the risk of malignancy is higher

than for simple cysts. As with simple cysts, FNA can be used to determine which of the above entities is causing the complex cyst, and to drain the cyst.

Inoperable Cancer

Some patients are not candidates for surgical biopsy because of extenuating clinical factors that make them an extreme anesthesia risk, or the tumor is so advanced

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that surgery would be of little help. In this population, FNA biopsy can be used to confirm the clinical impression of malignancy, and determine the type of tumor, (i.e. carcinoma, melanoma, lymphoma, sarcoma). If the malignancy is a carcinoma, hormone receptor studies, DNA analysis, cell kinetics, immunohistochemistry and molecular studies can be obtained on the FNA specimen so that non-surgical treatment plans can be considered.

Suspected Recurrence of Breast Malignancy

Patients with a history of breast carcinoma are at risk for recurrence, either in the scar, chest wall, or in the parenchyma near the primary location. Cells aspirated by FNA can be compared microscopically with the cells from the patient's primary tumor. Ancillary studies including hormone receptors and molecular studies can often be performed from the FNA sample.

Metastatic Disease

Metastasis of nonmammary malignant neoplasms to the breast represents 0.4-2% of all breast malignancies. In a study by Shukla et al, the patients with metastatic disease ranged in age from 13 to 80 years (mean, 36 years). In 46% of the cases, the masses were superficial, freely mobile and well circumscribed, leading to the clinical impression of a benign lesion. Seventy-three percent of patients had a known extramammary primary tumor at the time of FNA.

Metastatic lesions to the breast in young patients are most frequently rhabdomyosarcoma and

hematolymphoid tumors. In older patients, the most common malignant tumors metastatic to breast are hematolymphoid malignancies, melanoma and bronchogenic carcinoma.

Accuracy of FNA Biopsy

The quality of FNA biopsy depends on a variety of factors, including performance of the aspiration biopsy, microscopic examination, and incorporating history and physical examination findings. The following statistics were gathered from a compilation of data from 18 reported studies of FNA of breast masses.

Sensitivity = 92.5%
Specificity = 99.8%
Positive predictive value = 99.7%
Negative predictive value = 94.2%
Accuracy = 96.5%

Patient Considerations

FNA biopsy is well accepted and tolerated by patients. The Outpatient Cytopathology Center is usually able to accommodate patients quickly and schedule an appointment for a FNA biopsy within 24-48 hours.

References

- Shukla R, et al. *Diagn Cytopathol* 2005;32:193-197.
- Strax P. Detection of Breast Cancer. *Cancer* 66:1336-1340, 1990.
- DeMay RM. *The Art and Science of Cytopathology*. 1995; ASCP Press. Chicago.
- Orell SR, Sterrett GF, Whitaker D. *Fine Needle Aspiration Cytology*. 2005: Churchill Livingstone, Philadelphia.

COMPANY PROFILE

OUTPATIENT CYTOPATHOLOGY CENTER (OCC) is an independent pathology practice that specializes in performing and interpreting fine needle aspiration biopsy specimens. OCC is accredited by the College of American Pathologists. The practice was established in 1991 in Johnson City, Tennessee. Patients may be referred for aspiration biopsy of most palpable masses as well as for aspiration of non-palpable breast and thyroid masses that can be visualized by ultrasound. OCC is a participating provider with most insurance plans. Our referral area includes patients from Virginia, West Virginia, North Carolina, South Carolina and Georgia.

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