

The CSC Recommended Guidelines For The Practice Of Breast Cytopathology

Condensed from the NCI Uniform Approach to Breast Fine Needle Aspiration Biopsy
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The CSC developed guidelines for the practice of breast fine needle aspiration cytology in Canada. The initial steps of this process entailed a review of the literature and discussions among the CSC executive members who agreed, in principal, that the "Uniform Approach to Breast Fine-Needle Aspiration Biopsy" document developed by the National Cancer Institute is a comprehensive document that can be adopted as a guideline for the practice in Canada. The summarized version below was developed after considering the input of several Canadian experts in the field of cytopathology.

- I. Indications for breast fine needle aspiration (FNA)
 - A. Palpable breast masses of clinical or patient concern.
 - B. Non-palpable breast lesions may be subjected to image guided needle biopsies provided high-quality imaging is available and the procedures are performed by physicians qualified to interpret the images.

- II. Training

The FNA sampling procedure is a highly operator dependent and physicians who perform this procedure should receive formal training. Training should include: -

 - a. appropriate selection of FNA subjects
 - b. sample collection
 - c. sample preparation

- III. FNA biopsy technique for palpable lesions

Generally a 22-25 gauge needle is used. The needle is aimed at the central portion of the lesion and suction is applied (2-10ml) as the needle is moved in different directions within the lesion. Small lesions are better stabilized if they are brought to an immobile position under the skin before sampling. For necrotic and fibrotic lesions the needle should be aimed for the rim of tumor and sampling is attempted just inside the rim tangentially. Caution should be exercised when aspirating lesions of the upper inner quadrant to avoid pneumothorax.

The average number of FNA passes recommended for adequate sampling of most breast masses is 2-4. However, more passes may be needed in following conditions:

 - Lesion is difficult to stabilize or penetrate
 - Dry tap
 - Large lesion (> 4.0cm)
 - Carcinoma is suspected and the initial passes did not confirm the clinical suspicion.
 - Additional material is required for special studies.

- IV. Preparation of cytologic sample for basic diagnosis

Depending on the laboratory's preference direct smears or liquid based preparations may be used. Air dried direct smears are stained by Romanowsky stain and alcohol fixed preparations are stained by Papanicalaou/hematoxylin and eosin stains.

- V. Preparation of cytologic sample for ancillary studies

Cell blocks or cytopins are recommended for immunoperoxidase assays including stains for estrogen/progesterone receptors (ER/PR). Other studies (e.g. image analysis, immunoelectron microscopy, fluorescence in-situ hybridization, polymerase chain reaction) may require different preparation techniques.

- VI. Adequacy

An adequate specimen is one that leads to the resolution of a problem presented by a lesion in a particular patient's breast.

Adequacy is determined by two judgments:

1. Opinion of the aspirator that the cytologic findings, based on report, are consistent with the clinical findings and that the lesion was adequately sampled.
2. Opinion of the pathologist examining the smear that the slides do not have significant distortion or artifacts and can be interpreted.

There is no specific requirement for a minimum number of ductal cells to be present for a sample to be adequate and the mere presence of cells does not assure adequate sampling of a mass. Nevertheless, a laboratory may choose to require specific cell count as one of its own criteria for adequacy. It is recommended that a description of the quantity of epithelial cells in an aspirate be given in the report:

- hypocellular (occasional clusters)
- moderately cellular (clusters easy to find)
- markedly cellular (epithelial cells in almost every field)

VII. Diagnostic Terminology

A. Benign (negative for malignancy)

Underlying lesions may include: non-proliferative breast disease (e.g. cyst), fibroadenoma, abscess/mastitis, granulomatous mastitis, proliferative breast disease without atypia and pregnancy/lactation related changes.

B. Atypical/indeterminate

This diagnosis conveys that the lesion is probably benign although malignancy cannot be entirely excluded. Underlying lesions may include: proliferative breast disease with atypia (atypical ductal or lobular hyperplasia), papillary neoplasms, fibrocystic changes, fibroadenomas, phyllodes tumors, low grade in situ carcinoma, low grade invasive carcinoma (e.g. tubular carcinoma).

C. Suspicious/probably malignant

The cellular findings are highly suggestive of malignancy (70-100% of the underlying lesions are malignant on resection).

D. Malignant

The cellular findings are diagnostic of malignancy (this should be characterized further with the specific type of neoplasms when possible).

Nuclear grading of carcinomas may be required in certain circumstances (e.g. if neoadjuvant therapy is considered). Table I includes the criteria for cytologic grading (Robinson et al) and Table II includes the criteria for Fisher's modification of the Black's nuclear grading system.

Table I. Criteria for Cytologic Grading of FNAs of Breast Carcinomas Based on Wet- Fixed Papanicolaou-Stained Smears (Robinson et.al).

Criteria	Score 1.	Score 2	Score 3
Dissociation	Cells mostly in clusters	Mixture of single and cell clusters	Cells mostly single
Cell size	1-2 x RBC size	3-4 x RBC size	>5 x RBC size
Cell uniformity	Monomorphic	Mildly pleomorphic	Pleomorphic
Nucleoli	Indistinct	Noticeable	Prominent or pleomorphic
Nuclear margin	Smooth	Folds	Buds or clefts
Chromatin	Vesicular	Granular	Clumped and clear

Total score: 6-11= grade I, 12-14 = grade II, 15-18 = grade III

Table II. Cytologic Criteria for Black's Nuclear Grading System (Fisher's Modification)

Nuclear Grade	Nuclear size in relation to normal duct	Nuclear membrane	Chromatin	Nucleoli	Mitotic figures

3 (poor)	3-fold variation in nuclear diameter	Irregular	Hyperchromatic, coarse	Macro +/-	Frequent
2 (moderate)	2-fold variation; uniformity is the rule, with only slight variation	Round, smooth	Uniform, fine	Macro+/-	Moderate
1 (well)	Similar, minimal enlargement				

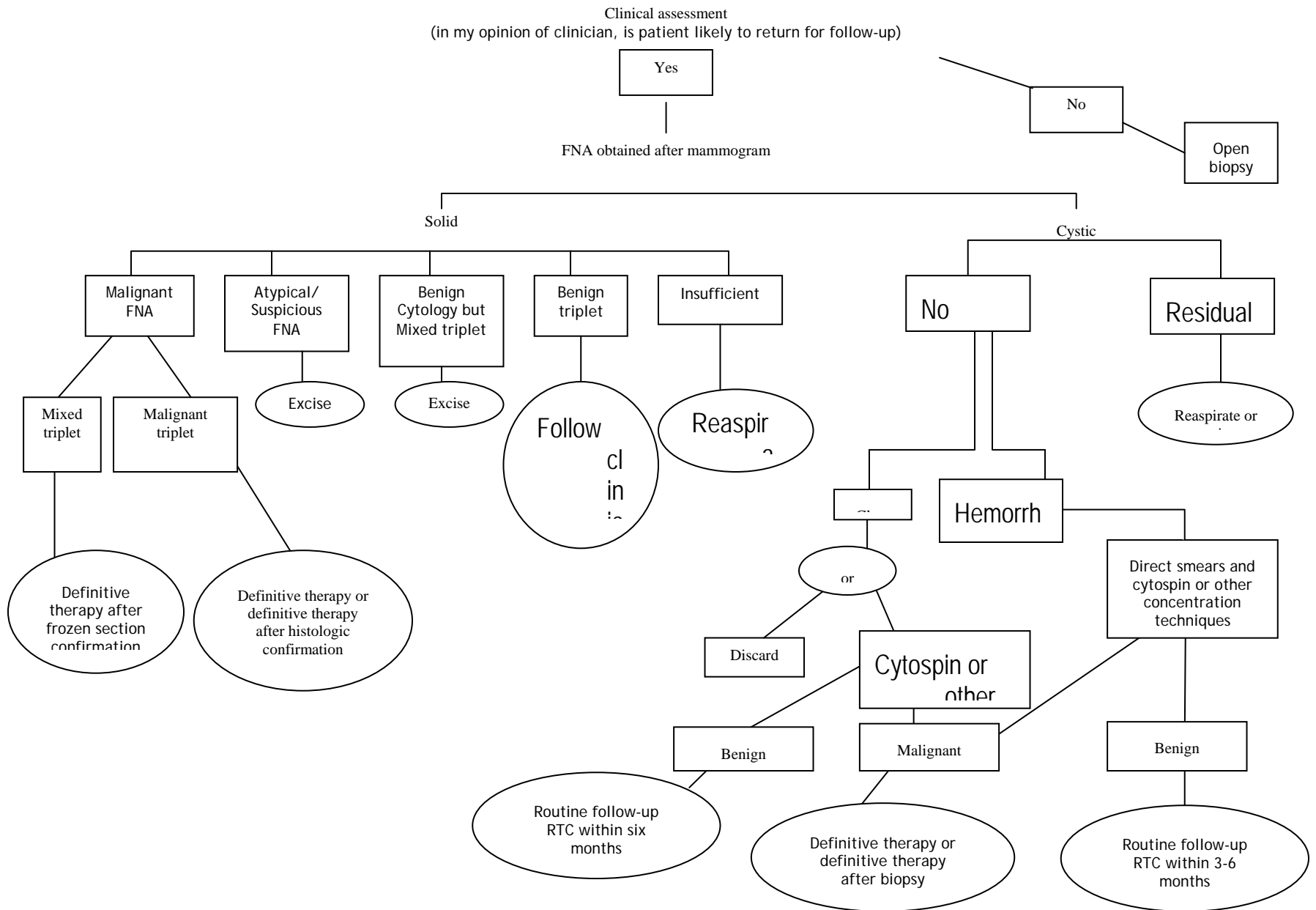
E. Unsatisfactory (due to):

- Scant cellularity
- Air drying artifact
- Obscuring blood or inflammatory exudate
- Other

IX. Post FNA Recommendation

The cytologic diagnosis should be correlated with the clinical and imaging characteristics to formulate a final diagnostic triplet.

Post tripple test (TT) NCI recommendation chart



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