

Interpretation of fine needle aspiration cytology of thyroid: do we need a better classification?

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Fine needle aspiration cytology technique (FNAC) is a very popular first line investigation for disorders of the thyroid gland. It is a rapid and cost effective technique that can be easily performed in any category of patients. This technique provides useful information for the clinician to plan out the strategy for management of patients.

It is critical therefore that the cytopathologist communicate thyroid FNA interpretations to the referring physician in terms that are unambiguous and clinically useful.

The currently used classification for thyroid FNAC includes the following categories.

- Thy 01 – Inadequate
- Thy 02 – Benign (colloid goiter, thyroiditis, toxic goiter)
- Thy 03 – Follicular proliferation (follicular neoplasm, hurthle cell neoplasm, adenomatoid nodule)
- Thy 04 – Suspicious for malignancy
- Thy 05 – Malignant (papillary, medullary, anaplastic carcinoma)

Lesions are classified as “Thy 01” when the cellular yield is inadequate. This is often encountered following the aspiration of highly vascular nodules and cystic lesions. One of the main advantages of this cost effective technique is that it can be easily repeated within a short time.

When there is unequivocal evidence of a benign condition such as colloid goiter, thyroiditis and hyperplastic nodule the lesion will be classified as “Thy 02”.

“Thy 03/follicular proliferation” category of the above classification includes a significant number of pathological entities with different clinical outcomes. Conditions that qualify to be included within the “Thy 03” category are hyperplastic nodules with highly cellular

smears, florid thyroiditis, neoplastic lesions such as follicular adenoma/carcinoma, hurthle cell tumours (hurthle cell adenoma/carcinoma) and certain types of papillary carcinoma, such as follicular variant of papillary carcinoma when the cytological findings are equivocal. Hence the spectrum of diseases within the “Thy 03” group is comparatively wide.

As such, from clinician’s point of view a cytological diagnosis of “Thy 03” in the current classification provides little information to plan out the management. Some of the pathological conditions within “Thy 03” do not require surgery and can be managed effectively by medical intervention. Conditions that require surgery need a further qualification as to the precise nature of the lesion. A significant number of “Thy 03” lesions end up with lobectomies as this category does not separate neoplastic from non-neoplastic lesions and benign from malignant conditions. Hence a cytological diagnosis of “Thy 03/follicular proliferation” fails to provide clinically useful information in most of the cases with regard to the management of the patient.

Thyroid lesions that have some but not all the features of malignancy are included in “Thy 04” category. The “Thy 05” category includes lesions having unequivocal cytological features of malignancy.

Time has arrived to change to a better classification that provides useful information to the clinician enabling him to decide the treatment option. By this means the number of unnecessary thyroid surgery for patients with thyroid disorders can be effectively reduced.

The Bethesda system for reporting thyroid cytology (BSRTC) consists of six diagnostic categories. It provides the definitions and morphologic criteria for the different categories. For clarity of communication, the Bethesda system for reporting thyroid cytopathology recommends that each thyroid FNA report begin with one of the diagnostic categories.

The BSRTC diagnostic categories are shown in Table 1.

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Table 1. The BSRTC diagnostic categories

I.	Non diagnostic or unsatisfactory
II.	Benign
III.	Atypia of undetermined significance or follicular lesion of undetermined significance
IV.	Follicular neoplasm or suspicious for a follicular neoplasm
V.	Suspicious for malignancy
VI.	Malignant

The Bethesda system provides definitions and morphologic criteria for the different categories. For the general categories, some degree of sub categorization which is appropriate has been allowed. Recommended terminology for sub categorization is shown in Table 2.

Table 2. Recommended terminology for sub categorization in the BSRTC

I.	Non diagnostic or unsatisfactory Cyst fluid only, acellular, obscuring blood
II.	Benign Colloid goiter, adenomatoid nodule, Hashimoto's thyroiditis, granulomatous thyroiditis
III.	Atypia of undetermined significance or follicular lesion of undetermined significance
IV.	Follicular neoplasm or suspicious for a follicular neoplasm Specify if hurthle cell (oncocytic) type
V.	Suspicious for malignancy Suspicious for papillary carcinoma Suspicious for medullary carcinoma Suspicious for metastatic carcinoma Suspicious for lymphoma Other
VI.	Malignant Papillary carcinoma Medullary carcinoma Poorly differentiated carcinoma Anaplastic carcinoma Metastatic carcinoma Lymphoma Other

Each diagnostic category has an implied risk of malignancy. In addition to that useful information, in the Bethesda system of classification of thyroid cytopathology each category has been linked to evidence based clinical management guidelines as shown in Table 3.

Table 3. Risk of malignancy in the BSRTC categories

Diagnostic category	Risk of malignancy (%)	Management
Non- diagnostic or unsatisfactory	–	Repeat FNA with ultrasound guidance
Benign	0 - 3	Clinical follow up
Atypia of undetermined significance or follicular lesion of undetermined significance	5 - 15	Repeat FNAC
Follicular neoplasm or suspicious for a follicular neoplasm	15 - 30	Surgical lobectomy
Suspicious for malignancy	60 - 75	Near total thyroidectomy or surgical lobectomy
Malignancy	97 - 99	Near total thyroidectomy

The Bethesda system for reporting of thyroid cytology provides clinically useful information as each diagnostic category is linked to a management option.

Time has arrived for a change in the reporting of thyroid cytopathology. Advantages of the proposed Bethesda system for reporting thyroid cytology has to be understood. It is of paramount importance for the clinicians to be aware of the diagnostic categories and the appropriate management options of the BSRTC. Consensus opinion with regard to the application of BSRTC can be arrived by clinicopathological discussions and collaborative meetings involving the specialists of clinical and paraclinical fields.

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