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Recommendation for Modification in the Bethesda System for Reporting of Thyroid Cytopathology: A Study in a Tertiary Care Hospital

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Abstract

Introduction: Thyroid is the endocrine organ situated in the midline of the neck.Its pathology varies from nutritional disorders like multinodular goiter to high grade malignancy like anaplastic carcinoma. Since the thyroid is superficially located and easily palpable, Fine needle aspiration cytology (FNAC) becomes the most common modality of investigation done for diagnosing thyroid lesions. The Bethesda system for reporting of thyroid cytology is most commonly used method for reporting FNAC of thyroid. *Material and methods:* It includes 100 cases of thyroid lesions. *Results:* All cases on FNAC reported as category II according to Bethesda system. On biopsy, all show features of multinodular goiter. *Discussion:* Category II should be sub categorised into IIA, IIB, IIC accordingly for Nodular, Lymphocytic thyroiditis and others respectively, as they have different pathogenesis, diagnostic modality and treatment protocol. *Conclusion:* Subcategorisation helps the clinicians to have distinct and well defined work up protocol for early diagnosis and treatment.

Keywords: Bethesda; Thyroid; Lymphocytes; Colloid.

Introduction

Thyroid is the endocrine organ situated in the midline of the neck. It secretes thyroid hormones which help in the maintenance of normal metabolism of the body. Its pathology varies from nutritional disorders like multinodular goiter to high grade malignancy like anaplastic carcinoma. Since the thyroid is superficially located and easily palpable, Fine needle aspiration cytology (FNAC) becomes the most common modality of investigation done for diagnosing thyroid lesions. FNAC of thyroid has lot of advantages. It includes less invasiveness, OPD procedure and early availability of reports. As biopsy is contraindicated due to high vascularity of thyroid gland, FNAC becomes the sole diagnostic modality of thyroid pathology [1,2]. The Bethesda system for reporting of thyroid cytology is most commonly used method for reporting FNAC of thyroid. It is more objective and clinically relevant way of reporting. It helps the treating doctor to plan the treatment protocol as per Bethesda system of reporting [3]. The present study is done for minor modification in the Bethesda system of reporting for more precise and conceptual way of reporting.

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Material and Methods

The present study is a retrospective study conducted from 2015 to 2016 (2 years). It includes 100 cases of thyroid lesions which were diagnosed as category II of the Bethesda system. All these cases have undergone pre-operative FNAC. All these cases are operated as total thyroidectomy. FNAC and biopsy of all these cases are correlated by two pathologists separately. Inadequate aspirates are excluded from our study.

Results

Total cases included in our study are 100. All these cases underwent FNAC before undergoing surgery. All these cases are diagnosed as category II as per Bethesda system for reporting of thyroid cytology. The diagnosis are categorised as follows.

Table 1: The table shows the various diagnostic terminology of FNAC under category II of Bethesda

Sl. No.	Diagnosis	Number of Cases
1	Colloid goiter	15
2	Colloid goiter with cystic change	11
3	Nodular goiter	26
4	Adenomatous nodule	10
5	Lymphocytic thyroiditis	38
	Total cases	**100**

All these cases underwent surgery, almost all had total thyroidectomy. The thyroid specimen is examined properly in grossing and the representative bits are studied under microscope. The histopathology diagnosis is well correlated with the FNAC diagnosis. The diagnosis on biopsy specimen is multinodular goiter with secondary changes like hemorrhage, calcification, fibrosis, lymphocytic aggregate and cyst macrophages.

Discussion

The National Cancer Institute (NCI) hosted the NCI thyroid fine needle aspiration state of the science, conference on October 22 & 23, 2007 in Bethesda. It is unanimously decided to frame a uniform way of reporting of thyroid cytology. It is called as "The Bethesda system for reporting thyroid cytopathology" [3,4,5]. It has six diagnostic categories as follows:

I . Nondiagnostic or Unsatisfactory

- Cyst fluid only
- Virtually acellular specimen
- Other (Obscuring blood , clotting artifact etc)

II. Benign

- Consistent with a benign follicular nodule (includes adenomatoid nodule, colloid nodule etc)
- Consistent with lymphocytic thyroiditis (Hashimoto) thyroiditis in the proper clinical context
- Consistent with granulomatous (sub acute) thyroiditis Other

III. Atypia of Undetermined significance or Follicular lesion of Undetermined significance

IV. Follicular Neoplasm or suspicious for a Follicular Neoplasm

V: Suspicious for malignancy

- Suspicious for papillary carcinoma
- Suspicious for medullary carcinoma
- Suspicious for metastatic carcinoma
- Suspicious for lymphoma

VI: Malignant

- Papillary thyroid carcinoma
- Poorly differentiated carcinoma
- Medullary thyroid carcinoma
- Undifferentiated (anaplastic)carcinoma
- Squamous cell carcinoma
- Carcinoma with mixed features (specify)
- Metastatic carcinoma
- Non-Hodgkin lymphoma
- Other

The present article is regarding category II of the Bethesda system. It denotes only benign lesions of the thyroid. It is composed of various diagnostic lesions such as colloid goiter, colloid goiter with cystic change, Nodular goiter, adenomatous nodules, Granulomatous lesion, Lymphocytic thyroiditis. Since granulomatous lesions are rare, purely inflammatory, hence are not discussed in the present article.

The FNAC lesions of category II, If broadly classified for the sake of discussion, into two distinct pathological spectrum.

First group includes colloid goiter, colloid goiter with cystic change, Nodular goiter, adenomatous nodules. On FNAC, the findings are as mentioned below:

Colloid goiter: scattered thyroid follicular cells+ abundant colloid.

Colloid goiter with cystic change: scattered thyroid follicular cells + abundant colloid + cyst macrophages

Nodular goiter: thyroid follicular cells in honeycomb shape+ abundant colloid.

Adenomatous nodule: hypercellular smear with predominant thyroid follicular cells in honeycomb shape, clusters + abundant colloid.

So, all these lesions have common biopsy findings

of multinodular goiter. On FNAC, these lesions have different terminology. If thyroid has predominant dilated follicles, FNAC will show colloid goiter. If thyroid has cystic degeneration, FNAC will show cystic change. If thyroid has dominant nodule, FNAC will shows features of Nodular goiter/adenomatous nodules.

Hence, If all this lesions are categorized under common sub heading (Eg. Category IIA, Hypothesis), It usually suggests the lesion is benign goiter. Then the clinicians have to do ultrasound of thyroid which show multiple colloid nodules. After this, the clinicians will go ahead with thyroidectomy without any other investigations.

Second group includes lymphocytic thyroiditis. On FNAC, it shows thyroid follicular cells in clusters admixed with plenty of lymphocytes, plasma cells. It may or may not be associated with Hurthle cell change, granulomas. Such cases are not operated. The clinician has do ultrasound of thyroid which shows uniform enlargement of thyroid without nodularity. Then, the clinician has to go ahead for biochemical test like anti TPO (Thyroid peroxidase) antibody test to diagnose it as Hashimoto's thyroiditis [9,10,11,12].

Thus, If this lesion is categorized under sub heading (Eg. Category IIB, Hypothesis), It usually suggests a case of thryoiditis.

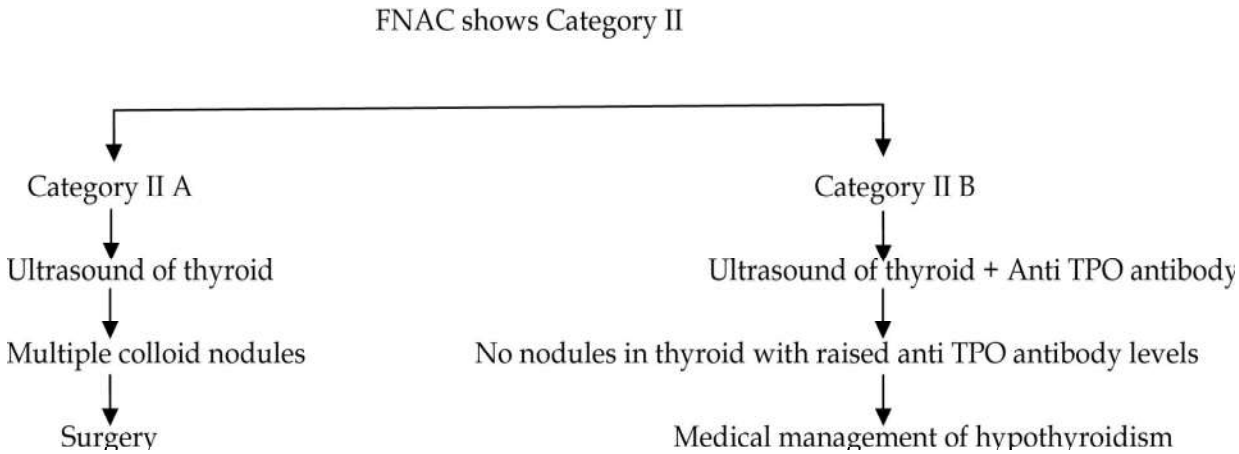
Thus, to summarise , our recommendation for new modification in The Bethesda system for thyroid cytopathology will be:

Category II:

Category II A: colloid goiter, colloid goiter with cystic change, Nodular goiter, adenomatous nodules.

Category II B: Lymphocytic thyroiditis

Category IIC: Other

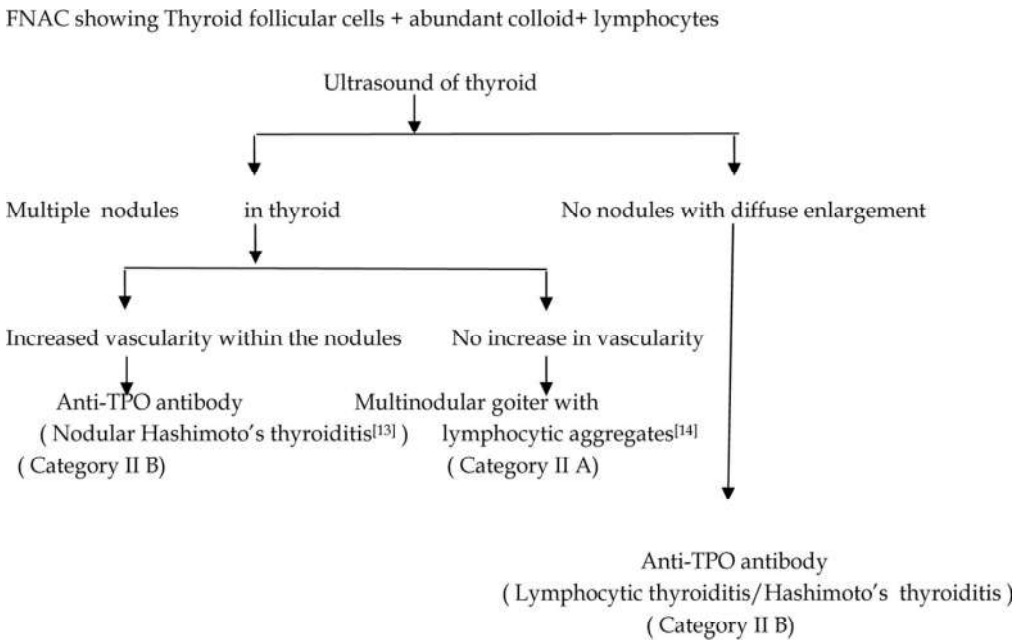


The following are the advantages of new modification:

1. It will properly guide the clinicians the way to approach the case. The algorithm is as follows
2. Both sub category (II A & II B) have different etiopathogenesis, diagnostic modality and treatment protocol. Hence, separate sub category needed.
3. Various diagnostic terminologies like colloid goiter, colloid goiter with cystic change, Nodular goiter, adenomatous nodules are confusing for the clinicians as the all these lesions denotes one diagnosis, multinodular goiter.
4. All other lesions where FNAC cannot give any definitive diagnosis or treatment plan like granulomatous thyroiditis, acute thryoiditis, Riedel thyroiditis can be sub categorised as Category II C.

Disadvantages of new modification are supposed to be nil as the categorization is linear and clear.

One more scenario appears in our day to day FNAC where it shows plenty of thyroid follicular cells with abundant colloid and lymphocytes (Not blood derived). Here, confusion arises whether the reporting should go as category IIA or IIB or IIC. In such cases, we have to follow the given below algorithm-



Conclusion

The Bethesda system for reporting thyroid cytopathology is the most objective way of reporting thyroid FNAC across the world. As the category II deals with benign lesions, it requires minor sub categorisation which helps the clinicians to have distinct and well defined work up protocol for early diagnosis and treatment.

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