

A Prospective Observational Assessment of Cyto-Histopathological Correlation in Thyroid Lesions

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Abstract

Aim: To correlate cytological and histopathological finding in thyroid lesions.

Material & Methods: This observational Prospective study was conducted in the Department of pathology, NMCH, Patna, Bihar, India, from February 2018 to January 2019

Results: A total of 105 patients with thyroid lesions were subjected to fine needle aspiration cytology during a period of 1 year. Of these 42 patients underwent surgery. In present study the cytology – histopathology concordance rate for non-neoplastic lesions is 89.0%.

Conclusion: By comparing the result of FNAC and histopathology, FNAC had higher accuracy, sensitivity of 80% and specificity 100% in the diagnosis of neoplastic thyroid lesions. FNAC is safe, inexpensive and less invasive diagnostic method with excellent patient compliance. FNAC can be used in the management of thyroid swelling to avoid unnecessary surgery on conditions like thyroiditis. FNAC with the help of imaging techniques is helpful in diagnosis of neoplastic lesion.

Keywords: cyto-histopathological correlation, thyroid lesions, FNAC

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Introduction

The incidence of clinically apparent thyroid swellings in the general population is 4%–5%. [1] Majority of these swellings are benign in nature, among which goiter being most common. The prevalence of goiter is more than 40 million in India with more than 2 billion globally. [2] The incidence of thyroid cancer in nodules varies from approximately 0.1% in the general population to 20% in surgically biopsied nodule. [3-4]

Fine-needle aspiration cytology (FNAC) of the thyroid gland is now a well-established, first-line diagnostic test for the evaluation of diffuse thyroid

lesions as well as of thyroid nodules with the main purpose of confirming benign lesions and thereby, reducing unnecessary surgery. [5] Thyroid cytology can provide a definite diagnosis of malignancy, with tumor type, enabling appropriate therapeutic surgery in one stage. It can triage the remaining patients into those who potentially require surgical as opposed to medical/endocrinological management. [6] Role of thyroid cytology is twofold: Therapeutic and diagnostic. [7]

Also, there are difficulties in differentiating between benign and malignant follicular neoplasms because of

many overlapping cytological features. Hence for final diagnosis, "histopathological examination" is necessary. [8-9]

Material & Methods:

This observational Prospective study was conducted in the Department of pathology, NMCH, Patna, Bihar, India, from February 2018 to January 2019

All the patients coming our hospital with thyroid lesions irrespective of age and sex was included in present study.

All the patients were clinically examined in detail according to the proforma and a careful palpation of the thyroid was done to guide precisely the location for doing aspiration. Details of the procedure were explained to the patients. Aspiration was done with the patient lying comfortably in a supine position and the neck was extended with a pillow under the shoulder so as to make the thyroid swelling appear prominent.

FNAC was performed under all aseptic precaution, with help of 23 gauge needle and disposable 5ml/10ml syringes. Whenever needed USG guided FNAC was

done. Smears was prepared, fixed in 95% ethyl alcohol and Stained with hematoxylin & eosin stains FNAC smears were carefully studied and categorized into non neoplastic and neoplastic lesions. Clearance from the Institutional Ethical committee was obtained. Statistical analysis was done with appropriate tests in consultation with a statistician.

Results:

The present study deals with the fine needle aspiration cytology of thyroid lesions and determination of diagnostic accuracy of aspiration cytology. A total of 105 patients with thyroid lesions were subjected to fine needle aspiration cytology during a period of 1 year. Of these 42 patients underwent surgery subsequently and the excised specimens were sent to the Department of Pathology for histopathological examination. Correlation between FNAC and histopathological study was done.

In the present study, of total 10 neoplastic cases, majority of the cases were of suspicious for follicular neoplasm (Figure 1).

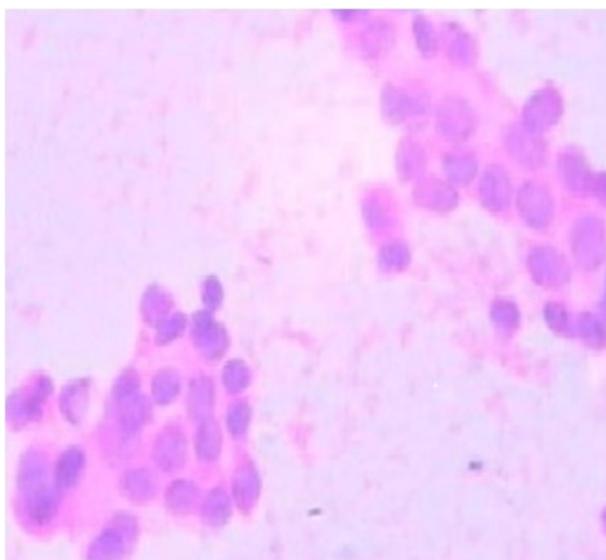


Figure 1: Follicular neoplasm

This was followed by suspicious for papillary carcinoma (Figure 2), medullary carcinoma and undifferentiated (Anaplastic) carcinoma (Figure 3).

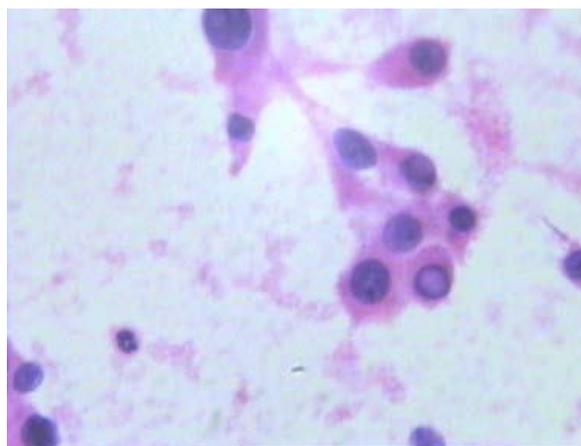


Figure 2: Papillary carcinoma of thyroid

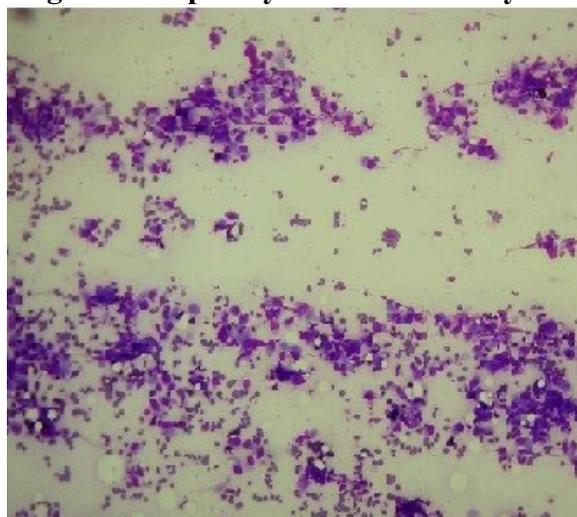


Figure 3: Anaplastic carcinoma of thyroid

Total number of cytological diagnosis was 105. Amongst them 94 were non-neoplastic and 10 were neoplastic. (Table 1)

Table 1: Cytological diagnosis

Cytological diagnosis-	Number (n)
Non-Neoplastic	94
Neoplastic	10
Inadequate	01
Total	105

In the present study following neoplastic lesions of thyroid were found - follicular adenoma, follicular carcinoma, papillary carcinoma, medullary carcinoma, undifferentiated (anaplastic) thyroid carcinoma (Table 2)

Table 2: Neoplastic Lesion on histopathology

Histopathological Diagnosis	Number	Percent (%)
Follicular adenoma	3	30
Follicular carcinoma	2	20
Papillary carcinoma	2	20
Medullary carcinoma	1	10
Undifferentiated (anaplastic) thyroid carcinoma	2	20
Total	10	100

In present study the cytology – histopathology concordance rate for Non-neoplastic lesions is 89.0%. (Table 3)

Table 3: Cyto-Histopathological correlation of neoplastic and non-neoplastic

Histological diagnosis	No. of patients	Cytological Diagnosis	
		Correlated	Non-Correlated
		No. of patients	No. of patients
Non-Neoplastic lesions	34	32	02
Follicular neoplasms	05	05	-
Medullary carcinoma	01	01	-
Papillary carcinoma	01	01	-
Anaplastic carcinoma	01	01	-
Total	42	40	02

Discussion:

For preoperative investigation of thyroid nodules, fine needle aspiration cytology is a well-established technique. To differentiate between benign and malignant thyroid nodules, this non-invasive technique is an efficient method. [10-11]

The cause of false negative results was the poorly cellular sample in a cystic papillary carcinoma and the thick fibrous capsule. Gagneten stressed the importance of doing multiple aspirations in a thyroid swelling in order to obtain representative material from different areas since the thyroid can be affected by more than one disease process. [12]

The diagnostic error was most commonly due to inadequate specimens and cystic lesions. One must be careful in committing a false negative diagnostic error in cystic lesions that contain macrophages and scanty material, since these features do not exclude malignancy. Repeat FNAC or thyroidectomy is advised for persistent nodules. [13-14]

Yassa et al. [15] and Nayar and Ivanovic, [16] who reported 7% and 5% unsatisfactory smears in their studies, respectively, whereas Jo et al. [17] reported much higher percentage (18.6%) of nondiagnostic/unsatisfactory smears in their study. Usually, an ultrasound-guided FNAC is performed for small nodules or nodules that appear heterogeneous on

palpation and cytopathologist himself performs the procedure of FNAC, thereby ensuring a lower percentage of cases in non-satisfactory category as well as giving a better quality of adequate aspirate. [18,19]

No reliable cytologic feature distinguish follicular adenoma from follicular carcinoma and distinction between the two is based solely on demonstration of histologic evidence of capsular/and or vascular invasion. [12]

Conclusion:

By comparing the result of FNAC and histopathology, FNAC had higher accuracy, sensitivity of 80% and specificity 100% in the diagnosis of neoplastic thyroid lesions. FNAC is safe, inexpensive and less invasive diagnostic method with excellent patient compliance. FNAC can be used in the management of thyroid swelling to avoid unnecessary surgery on conditions like thyroiditis. FNAC with the help of imaging techniques is helpful in diagnosis of neoplastic lesion.

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