



FINE NEEDLE ASPIRATION CYTOLOGY IN DIAGNOSIS OF THYROID LESIONS

Pathology

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ABSTRACT

Introduction: Fine needle aspiration (FNA) cytology is a widely utilized tool for the diagnosis of thyroid lesions with a high degree of sensitivity, specificity and diagnostic accuracy. **Materials and methods:** A retrospective hospital based study was done in which a total of 90 cases of thyroid lesions were included. All cases were categorized according to the Bethesda system for reporting thyroid cytology (TBSRTC) into unsatisfactory, benign, atypia of undetermined significance or follicular lesion of undetermined significance, follicular neoplasm or suspicious for a follicular neoplasm, suspicious for malignancy, malignant. **Results:** The study included 90 cases. Female to male ratio was 2.6:1, and maximum number of cases was observed in age group 21-30 years. Out of 90 cases, 4 cases were diagnosed as unsatisfactory, 55 as benign, 4 as atypia of undetermined significance or follicular lesion of undetermined significance, 09 as follicular neoplasm or suspicious for a follicular neoplasm, 07 as suspicious for malignancy, and 11 as malignant. Most common benign lesion was nodular goitre representing the majority of benign cases (72.7%), while papillary carcinoma was the most frequent malignant lesion (72.7%). **Conclusion:** We conclude that FNAC is a simple, safe, minimally invasive and reliable technique for evaluation of thyroid lesions.

KEYWORDS

Fine Needle Aspiration, thyroid, papillary Carcinoma, follicular neoplasm.

INTRODUCTION

Background: In the past five or six decades, fine needle aspiration (FNA) cytology of the thyroid has been increasingly utilized for the investigation of thyroid lesions. FNA has been shown to be the safest and most accurate of diagnostic tools in thyroid lesions with a sensitivity as high as 93.4%, a positive predictive value of malignancy of 98.6% and a specificity of 74.9%; its use has simultaneously diminished the number of surgeries done for benign lesions and increased the proportion of malignancies in surgically resected thyroids.^{2,3} To address the terminology and other issues related to thyroid FNA, the National Cancer Institute (NCI) hosted the "the NCI Thyroid Fine Needle Aspiration State of the Science conference" in 2007 at Bethesda, Maryland. The conclusions of the meeting led to the Bethesda Thyroid Atlas Project and formed the framework for The Bethesda System for Reporting Thyroid Cytology (TBSRTC). The adoption of the system will facilitate communication among the cytopathologist, surgeon, endocrinologist and radiologist and also allow easy and reliable sharing of data from different laboratories for national and international collaborative studies.⁴

TBSRTC: recommended diagnostic categories⁴ is as follows:

1. Non diagnostic or unsatisfactory

- A. Cystic fluid only.
- B. Virtually acellular specimen
- C. Other (obscuring blood, collecting artifacts etc)

2. Benign

- A. Consistent with a benign follicular nodule (includes adenomatoid nodule, colloid nodule etc)
- B. Consistent with lymphocytic (Hashimoto) thyroiditis in the proper clinical context.
- C. Consistent with granulomatous (subacute) thyroiditis.
- D. Other.

3. Atypia of undetermined significance or follicular lesion of undetermined significance.

4. Follicular neoplasm or suspicious for a follicular neoplasm.

5. Suspicious for malignancy.

6. Malignant

- A. Papillary thyroid carcinoma
- B. Poorly differentiated carcinoma.
- C. Medullary thyroid carcinoma
- D. Undifferentiated (anaplastic) carcinoma
- E. Squamous cell carcinoma
- F. Carcinoma with mixed features (specify)
- G. Metastatic carcinoma
- H. Non Hodgkin's lymphoma

I. Other.

MATERIALS AND METHODS:

A retrospective study was done in the Department of pathology of a tertiary care hospital for a period of one year. A total of ninety cases of thyroid lesions, attending the outpatient and inpatient wards of surgery department of a tertiary care hospital were included in the study. The cases were thoroughly interrogated, clinically examined and relevant investigations (thyroid hormonal profile and imaging studies) done. After examining the thyroid with the patient sitting upright, the patient was made to lie supine with a pillow behind the neck for hyperextension, which makes the lesion more obvious. After instructing the patient to refrain from swallowing, the lesion is needed with a fine needle quickly and gently at different angles and points of entry. Needling is concluded as soon as material appears at the hub of the needle, the needle is then attached to an air-filled syringe, and material deposited and smeared onto clean glass slide. The aspirations were air dried, stained with the May Grunwald Giemsa method and examined microscopically. The smears were screened under low and high magnification and diagnosis was made according to the Bethesda System for Reporting Thyroid Cytology (TBSRTC)

RESULTS AND OBSERVATIONS:

Most common benign thyroid lesion was found to be nodular goitre while the commonest malignant lesion was papillary carcinoma. Maximum number of cases was observed in age group 21-30 years. Benign thyroid lesions were more common in the age group of 21-30 years while malignant thyroid lesions were common in the age group of >40 years. There were 65 female and 25 male cases in our study as shown in table 1.

TABLE – 1 AGE AND SEX DISTRIBUTION OF SUBJECTS

AGE	FEMALE	MALE
11-20 Years	05	0
21-30 Years	23	13
31-40 Years	20	09
41-50 Years	11	03
51-60 Years	02	0
61-70 Years	03	0
71-80 Years	01	0
81-90 Years	00	0
TOTAL	65	25

Out of 90 cases, 4 cases were diagnosed as unsatisfactory, 55 as benign, 4 as atypia of undetermined significance or follicular lesion of undetermined significance, 09 as follicular neoplasm or suspicious for a follicular neoplasm, 07 as suspicious for malignancy, and 11 as malignant as shown in table 2. Most common benign thyroid lesion

was found to be nodular goitre while the commonest malignant lesion was papillary carcinoma.

TABLE – 2 CYTOLOGICAL DIAGNOSIS

CYTOLOGICAL DIAGNOSIS	NO OF CASES	PERCENTAGE
Unsatisfactory	04	4.4%
Benign	55	61.1%
Atypia of undetermined significance	04	4.4%
Follicular neoplasm	09	10%
Suspicious of malignancy	07	7.7%
Malignant	11	12.2%
Total	90	100%

In our study a benign diagnosis of nodular hyperplasia was reported in 40 cases, simple colloid goitre in 05 cases, lymphocytic thyroiditis in 05 cases, cyst in 03 cases, granulomatous thyroiditis in 02 cases.

Among the 11 malignant lesions diagnosed by FNAC, 08 were papillary carcinoma as shown in figure 1, 02 were medullary carcinoma and 01 was poorly differentiated malignant neoplasm.

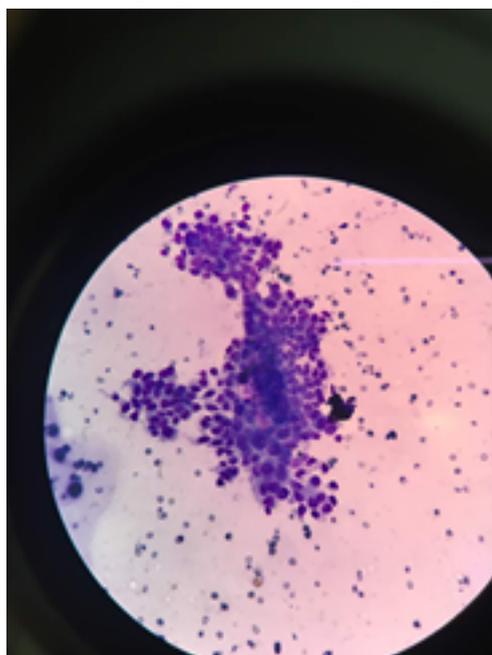


Fig 1: Cytology of Papillary carcinoma

DISCUSSION:

Although thyroid swellings are a major clinical problem, most of them are non neoplastic and do not require surgical intervention. Accurate screening investigations aid the clinician in selecting the subset of patients who truly require surgical intervention, while avoiding surgery in patients with benign conditions who might be exposed unnecessarily to surgical risk and a plethora of post surgery complications.⁵

We found 4.4% cases as unsatisfactory. Published studies show inadequate sample range between 2 and 20 %.⁶ The number of inadequate samples can be minimized by taking samples from different parts of the lesion and by ultrasound guided aspiration of small lesions.

A diagnosis of Atypia of undetermined significance/Follicular lesion of undetermined significance (FLUS) was given to cases that showed atypia that was not sufficient to designate as follicular neoplasm, suspicious of malignancy or malignant. We found 4.4% of cases of follicular lesion of undetermined significance. Literature search shows 3–18 % of thyroid FNAs reported as FLUS.^{7,8,9,10}

In our study, papillary carcinoma was the most common malignancy which was in accordance to the study done by Renu Sukumaran et al.⁵

CONCLUSION:

Fine needle aspiration cytology is a simple, cost effective, rapid to perform procedure with high degree of accuracy and is recommended as the first line investigation for the diagnosis of thyroid lesions.

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