

Cytopathological study of thyroid neoplasm at tertiary care center

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Abstract:

Background: fine needle aspiration cytology(FNAC) is the gold standard among diagnostic tests for evaluation of thyroid lesions. It is important to diagnose benign and malignant lesion of thyroid preoperatively to prevent unwanted surgeries.

Aim: To study all the palpable thyroid lesions and classify them according to The Bethesda System of Reporting Thyroid Cytopathology (TBSRTC) which would help in planning further treatment plan.

Methods: In the present study, evaluation of 100 cases of thyroid FNA's was taken and interpreted from July 2017 to July 2018. All thyroid lesions conventionally diagnosed by FNA were classified according to TBSRTC.

Results: In the present study, a total of 100 cases of thyroid swellings were analyzed, out of which 85 cases were diagnosed as non-neoplastic lesions, 2 cases were diagnosed as suspicious for malignancy, and 13 cases were diagnosed as neoplastic lesions by FNAC. The results were further classified under TBSRTC.

Conclusion: FNAC has been shown to be gold standard diagnostic tool in thyroid lesions. It is safe, cost effective and minimally invasive method. FNA helps to reduced numbers of unnecessary surgery in benign lesions.

Keywords: FNAC, Thyroid Swellings, TBSRTC,

Introduction

Thyroid disorders are the most common endocrine disorders worldwide, including India. In last five or six decade, fine needle aspiration (FNA) cytology of the thyroid has been increasingly utilized for investigation of thyroid lesion. FNAC is now a well-established, first-line, simple and quick screening test as well as the diagnostic tool for triaging surgical and non-surgical goiters¹. Preoperative distinction of benign lesions is important to avoid unnecessary surgery. FNA has been shown to be able to categorize many benign and malignant lesions and thereby guide therapeutic protocols . FNA has been shown to be the safest and most accurate of diagnostic tools in thyroid². FNA has proven to be better than other methods like clinical examination, radionuclide, or thyroid ultrasound (US) assessment. FNAC is considerably a safe outpatient procedure. It is a cost-efficient and minimally invasive technique that can be performed in aged and pregnant women as well³.

It was the NCI (National Cancer Institute) Thyroid FNA State-of the-Science Conference which gave the impetus to publish an atlas and guidelines using a standard taxonomy for the interpretation of thyroid FNA's. The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) was an offshoot of this⁴.

There is a vivid description of the six diagnostic categories of thyroid lesions. They are non-diagnostic or unsatisfactory, benign, Atypia of undetermined significance/follicular lesion of undetermined significance, follicular neoplasm/" suspicious" for follicular neoplasm, suspicious for malignancy and malignant.

This study aims to diagnose and study the Cytomorphological features of all solitary and diffuse thyroid nodules by FNAC and classify them based on TBSRTC.

Materials and Methods

The present prospective study was done during the period from June 2017 to June 2018 comprising of 100 patients who were presented with history of palpable thyroid lesions at GGG hospital jamnagar. All the patients were clinically examined in detail. Materials used in this study included a 10 ml or 5 ml syringe and a 22 gauge needle.

The patient was advised to lie in the supine position with the head and neck extended over a pillow. The sight was cleaned by using spirit swab, and it was made sure that the extension of the neck would not interfere with nodule palpation or obstruction with vertebral artery blood flow in the elderly. For nodules, 1.5 cm or smaller, to and fro movements of the needle into the nodule was done. For larger nodules, peripheral sub-capsular parts of nodules were sampled rather than the center. The needle was then removed and the plunger was withdrawn, after the aspiration. The needle was then re-affixed and the aspirate was transferred onto clean labeled glass slides, which was then smeared with another glass slide. A number of multiple smears were made, with a minimum of 4-5 smears. Slides were fixed immediately in 95% ethanol and stained by Papanicolaou staining (pap), H&E and air-dried smears were stained with May-Grunwald Giemsa (MGG) stain.

Diagnostic criteria

An adequate sample must be representative of the lesion (the specimen is taken from the appropriate location) and adequate in amount. Smear is considered “adequate,” when: 5-6 groups of well-preserved follicular epithelial cells with 10 or more cells/group; 10 large clusters of follicular epithelial cells with more than 20 cells each; 6 groups of follicular epithelial cells on at least 2 of 6 aspirates; and at least 8-10 tissue fragments of well-preserved follicular epithelium on each of two slides, for a total of at least six properly prepared thin cell spreads from multiple punctures of the nodule⁵.

Results

FNAC was performed on a total of 100 cases for cytological evaluation. Age of the patients ranged from 11 to 78 years with a mean age of 33.5 years. The majority of patients were females comprising of 91 cases, and 9 cases were males. The male to female ratio was 1: 10. The majority of patients presented clinically with diffuse thyroid enlargement comprising of 60 cases, followed by right lobe swelling comprising of 21 cases and left lobe swelling comprising of 19 cases. Non-neoplastic lesions comprised 85 cases followed by 13 cases of neoplastic lesions and 3 cases comprised suspicious of malignancy [Table 1] Of the non-neoplastic lesions, 4 cases were non-conclusive, 5 cases were cysts, 50 cases were goiter, 20 cases were thyroiditis and 6 cases were primary hyperplasia [Table 2]. Out of the 4 cases, 3 cases were papillary carcinoma and one case was anaplastic carcinoma. Out of the neoplastic lesions, 9 cases were benign follicular

neoplasms and 4 cases were malignant [Table 3]. TBSRTC categorization was done in all the cytologically diagnosed cases. Out of the total 100 cases, 4 cases belonged to non-diagnostic/unsatisfactory – I Category, 81 cases belonged to benign – II Category, no cases were classified under Atypia of undetermined significance – III Category, 9 cases belonged to follicular neoplasm/suspicious for follicular neoplasm – IV Category, 2 cases belonged to suspicious for malignancy – V Category, and 4 cases belonged to malignant – VI Category [Table 4]. Cytopathological features of different thyroid disorders were also studied in detail.

Discussion

FNA has proven the cornerstone for preoperative evaluation of thyroid nodules. Its main purpose is to provide a rational approach for management and determine the correct surgical procedure when surgery is required.

Within the general population, palpable thyroid nodules are present in 4-7% of adults and sub clinical (non palpable) nodules are present in upto 70% of individuals⁶. The majority of clinically diagnosed thyroid nodules are non neoplastic with about 30-50% being malignant.

In the present study maximum numbers of cases were seen in female patients with M: F 1: 10, which correlate with the observation made by silverman et al⁵ 1: 10, Gupta et al¹: 117

In the present study maximum cases were between age group of 31-40 year 28%. similar observations by Parikh et al²³. 75%⁸.

In this present study maximum numbers of cases 85% are benign, 2% belonged to suspicious for malignancy and 13% are malignant.

In the present study 2 cases were categorized into suspicious for malignancy which is concordant with the study of Singh et al⁹

In the present study carcinoma group comprised 4 cases which were similar to observation of Handa et al¹⁰.

Out of 100 cases, as per TBSRTC, 4 cases were unsatisfactory-category I as the diagnostic criteria didn't meet, 85 cases belonged to benign -category II, no cases were classified as atypia of undetermined significance-category III, 9 cases were belonged to follicular neoplasm/ suspicious for follicular neoplasm- category IV, 2 cases were suspicious for malignancy-category V which were advised for further histopathological examination, 4 cases belonged to malignant-category VI.

The majority of cases were classified under benign lesion category II in the present study which is concordant to other studies conducted by Wu et al. ¹⁴ Yassa et al. ¹⁵ and Mondal et al. ¹⁶

The majority cases of suspicious for malignancy- category IV in the present study were concordant to other study conducted by Yassa et al¹⁵. while the category VI malignant lesions were concordant to study conducted by Singh et al⁹.(table no 6)

However, there are also possible limits and pitfalls of this procedure as sometimes haemorrhagic aspirates give trouble in identifying the morphology

of cellular details resulting false positive or false negative results.

Histopathological examination for confirmation is advised in suspicious for malignancy cases.

Conclusion: The conclusion from this study implicates FNAC as a useful primary investigative modality for evaluation of palpable thyroid nodules. FNAC has a high accuracy in differentiating benign and malignant lesions. TBSRTC aids in accurate cytological diagnosis & will prevent unnecessary surgeries. An effective implementation of this system would allow consistency in reporting of diagnostic terminologies between the cytopathologists and clinicians in different parts of the world.

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