



A Three Years Study of Fnac of Thyroid Lesions in A Tertiary Care Hospital

KEYWORDS

Fine Needle Aspiration; Cytology; Thyroid

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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 for preoperative and pretreatment diagnosis of benign and malignant lesions, thus decreasing the incidence of and preventing unwarranted surgeries.

Objectives; This study aims to study and classify various cytomorphological lesions of the thyroid according to The Bethesda System for Reporting of Thyroid Cytopathology (TBSRTC). We did a retrospective study of results of FNAC in thyroid lesions, from February 2013 to January 2016. Fine needle aspiration done on 664 patients with palpable thyroid lesions were analyzed and classified according to TBSRTC. Results; Out of total 664 cases studied, 530 (79.81%) were non neoplastic, 92 (13.85%) were neoplastic, 12 (1.8%) was indeterminate and 30 (4.51%) was inadequate. Conclusion; FNAC is a simple, safe, cost effective and widely accepted modality for evaluation of thyroid lesions especially in Third world countries like India. FNA helps to avoid unnecessary surgery in patients with benign lesions. The suspicious and indeterminate lesions are an area of uncertainty which can be resolved by histopathology.

Introduction

Thyroid gland is a major endocrine gland situated in front of the neck and has the largest store of hormones among all endocrine organs and has the capacity to adapt to many physiological stimuli like stress, puberty, pregnancy etc.

Fine Needle Aspiration Cytology (FNAC) is one of the best methods of all available modalities in evaluating thyroid lesions.

It is safe, inexpensive, easily performed with minimal patient discomfort.

Thyroid FNAC was first described by Greig and Grey in 1904 and was first applied to tumour diagnosis in 1930 by Martin.

System for Reporting Thyroid Cytopathology (TBSRTC) was published in January 2010 by the National Cancer Institute, Bethesda, Maryland,

USA. It was created to unify the terminology for results of FNAC to facilitate a better and more effective communication among the pathologists, endocrinologists, radiologists, surgeons and other health care providers terms of better cyto-histopathological correlation, epidemiology, molecular biology and diagnosis of thyroid disease. FNAC has high diagnostic accuracy of 90% to 100%, false positive rates of <1% and false negative rates of 1% to 11%.

Hence, TBSRTC is widely practiced in recent years to overcome ambiguities in report.

TBSRTC is organized in six diagnostic categories from Bethesda I to VI as given

I. Non diagnostic or unsatisfactory

- Cyst fluid only
- Virtually acellular specimen
- Other (obscuring blood artifact, etc.

II. Benign

- Consistent with benign follicular nodule (includes adenomatoid nodule, colloid nodule
- Consistent with lymphocytic

(Hashimoto's) thyroiditis in proper clinical context

- Consistent with granulomatous (subacute) thyroiditis
- Other
- III. Atypia of undetermined significance or follicular lesion of undetermined significance (AFLUS)
- IV. Follicular neoplasm or suspicious for follicular neoplasm cell type (FN or SFN)
- V. Suspicious for malignancy (SM)
 - Suspicious for papillary carcinoma
 - Suspicious for medullary carcinoma
 - Suspicious for metastatic carcinoma
 - Suspicious for lymphoma
 - Other

VI. Malignant

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

This classification establishes correlation between the cytology of FNA contents and the different thyroid diseases, mainly in terms of malignancy associated risk.

In this context, the present study was conducted and analysis of the cytomorphology was done.

MATERIALS AND METHODS:

The present study was a retrospective study under taken in the Department of Pathology of a tertiary care hospital of North east India for 3years duration from

February 2013 to January 2016. Patients with thyroid swelling having clinical indication for FNAC were examined and after taking consent, they were subjected to FNAC in the Department. In this study, total 664 patients that were referred for FNAC study were included. All the patients were examined clinically in detail according to the prescribed proforma and were given an explanation on the FNAC procedure in their own language. Under aseptic precautions, a sterile 23 gauge needle attached to 10 cc syringe was inserted into the lesion.

Negative pressure was applied wherever required by pulling the plunger of the syringe and multiple passes were done quickly and gently at different angles from the point of entry. After releasing the negative pressure, needle was withdrawn immediately and material appeared at hub of the needle. Non aspiration technique was applied wherever aspiration was not required. The needle was then attached to an airmaterial deposited and smeared were prepared using clean glass slides.

MGG stain was done before studying under light microscope. Where ever fluid was aspirated, the fluid was centrifuged and smears were prepared from sediment and stained as described above. The efficacy of FNAC was estimated by using this methodology.

RESULTS

In our study we included 664 subjects.475 (71.53%) were females and 147(28.47) were males.Male:Female ratio was 1:3.2.Age distribution was from 8 years to 78 years. Maximum cases were in the age group of 40-49 years with 164(24.69%) of cases followed by the age group of 30-39 with 128(19.22%) cases.There were 50 malignant cases(7.53%).Malignancy was most common in the age group of 30-39years with 30 cases(60%).Wherease Colloid Goitre was the most common lesion with 301(45.17%) cases.It was the most common lesion in all age groups also.

Frequency of lesions according to the TBSRTC is as follows:

- 1.Non diagnostic or unsatisfactory:80 cases(12.04%)
- 2.Benign lesions:480 cases(72.29%)
- 3.Atypia of undetermined significance or follicular lesion of undetermined significance:12 cases(1.8%)
- 4.Follicular neoplasm or suspicious for follicular neoplasm :32 cases(4.81%)
- 5.Suspicious for malignancy:10 cases(1.5%)
- 6.Malignancy:50 cases(7.53%).

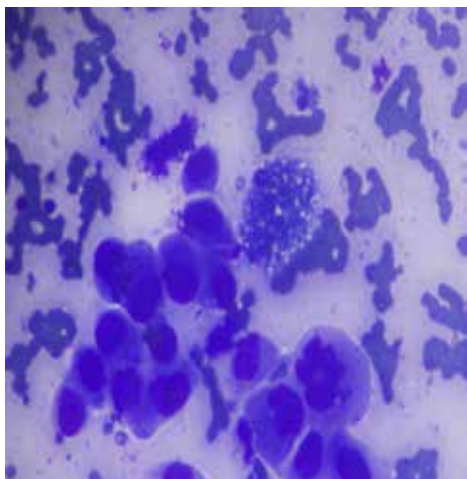


Fig:Photomicrograph of Anaplastic Carcinoma,10x10,MGG.

DISCUSSION:

Fine Needle Aspiration Cytology is the single most sensitive, specific, and cost effective method of investigation, which distinguish neoplastic from non neoplastic lesions of the thyroid and can effectively triage patients. The application of FNAC using TBSRTC has reduced the number of patient undergone surgery for benign thyroid disease and increased the yield of malignancy in surgical specimens from 5% to 10% to as much as 30% to 50%. a study during the year 2008 by G.A. Theoharis, et al., a total of 3207 thyroid nodules in 2468 patients underwent FNA. The distribution of lesions from these 3207 evaluated nodules was 11.1% unsatisfactory, 73.8% benign, 3.0% indeterminate, 5.5% FN, 1.3% suspicious, and 5.2% malignant.The findings of our study after classifying according to TBSRTC was very similar with this study.The malignancy cases were little higher than the study of G.A.Theoharis et al.However results were very similar.

In year 2009, Jo VY, Stelow EB, Dustin SM, and Hanley KZ of the University of Virginia Health System, Charlottesville reviewed 3,080 thyroid FNA samples and recorded interpretations according to the proposed standardized 6 nomenclature of TBSRTC, and follow with histology. The risk of malignancy in this study was also in accordance with those reported by others using TBSRTC . Baloch in the year 2009 documented the diagnostic accuracy of the NCI classification of TBSRTC. They concluded that this classification had high diagnostic utility.

The present study shows that females were more affected than males with a Female:Male ratio of 3.2:1.71.53 % of our study subjects were females while rest 28.47% were males.However it was less as compared to other Indian studies of Kapila et al,Vasudev et al. In this study, the nonneoplastic to neoplastic ratio was comparable with the Godinho-Matos L et al and Sengupta et al studies.The ratio was found to be 5.76. The ratio in other studies varied from 2.41:1 to 12.29:1.

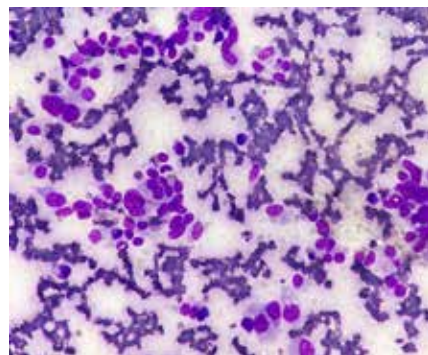


Fig: Photomicrograph of Medullary carcinoma 10x10 MGG.

CONCLUSION: The primary objective of FNAC of the thyroid is to differentiate those patients who require surgery for a neoplastic disorder from those who have a functional or inflammatory abnormality and who can be followed clinically or treated medically. Fundamental to the success of efficient reporting of thyroid cytology is adequate history with complete clinical examination, technical competence in performing the procedure, preparation of smears and their evaluation. Interpretation of cytologic material requires a great deal of experience and multiple sites of the lesion should be aspirated to avoid missing any occult malignancy. The introduction of The Bethesda System for Reporting Thyroid Cytopathology has brought

about standardisation in the reporting of thyroid FNAC. It helps to clearly communicate cytologic interpretations to referring physicians in terms that are clinically helpful and unambiguous.

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