

A Prospective Study on Assessing the Reliability of Fine Needle Aspiration Cytology in Outcomes of Thyroid Lesions

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ABSTRACT

Background: FNAC has been considered as gold standard technique to diagnose various thyroid gland lesions. As Thyroid gland is superficial in location it is easily approachable for direct physical examination, cytological evaluation & histopathological study. The main objective of FNAC of thyroid is to categorize patients who need surgery for neoplastic disorder from those having functional or inflammatory abnormality requiring a clinical follow up & medical treatment. **Aims & Objectives:** To study cytomorphological features of thyroid enlargement & palpable lesions of thyroid. To correlate cytomorphological features of thyroid lesions with histopathological features wherever possible. **Methods:** The present study was conducted in Department of Clinical Pathology, Lok Nayak Jai Prakash Narayan Hospital. Around 150 cases of thyroid lesions were enrolled during the period 3 years (March 2014-February 2017). All relevant clinical profile of these cases was taken from case records. **Results:** In the present study, a total of 150 cases of thyroid swellings were categorized under TBSRTC. Of which maximum cases were seen of benign etiology i.e. colloid goitre more commonly

affecting middle age group i.e. 31-45yrs with female preponderance. As sensitivity & specificity of FNAC was considered, in benign Sensitivity & specificity was reported to be 96% & 100% respectively. Whereas, in malignant lesions both were found to be 100%. **Conclusions:** The conclusion drawn from this study implicates FNAC as a useful primary investigative modality for evaluation of palpable thyroid lesions. It also helps in distinguishing lesions based on the clinical management required.

Keywords: Thyroid lesions, Fine Needle Aspiration Cytology, Neoplasms.

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INTRODUCTION

Thyroid gland because of its superficial location, can easily be approached for direct physical examination, cytological evaluation & histopathological study. Thyroid lesions are seen in 4-7% of population more commonly affecting females than males. Excision of all thyroid lesions is practically impossible & associated with greater risk.^[1,2]

Therefore Thyroid FNAC has proven as the most accurate & cost effective initial method for directing the clinical management of patients with thyroid swellings.^[3-5]

From the past 3 decades, confidence in FNAC as a reliable procedure has grown considerably and has emerged as a most direct, accurate diagnostic tool in the management of thyroid disease, gaining world wide popularity.^[3,6]

The main objective of FNAC of thyroid is to categorize patients who need surgery for neoplastic disorder from those having functional or inflammatory abnormality requiring a clinical follow up & medical treatment.^[7] Different imaging techniques are used for preoperative diagnosis of thyroid

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swellings like radionucleotide scanning, high resolution ultrasonography etc. However, FNAC is accurate & cost effective OPD procedure in comparison to imaging techniques, sometimes its need ultrasound guidance especially in cystic lesions. But the success of FNAC is based on expertize aspiration, Skilful cytological interpretation and Rational analysis based on cytological & clinical information regarding individual patient.

Therefore, this study is undertaken to identify the cytomorphological spectrum of various thyroid lesions & correlating histopathologically wherever possible.

METHODS

The present study was conducted in Department of Clinical Pathology, Lok Nayak Jai Prakash Narayan Hospital during the period 3 years (March 2014-February 2017).

Around 150 patients presented with Thyroid problems were enrolled on the basis of inclusion and exclusion criteria.

FNAC was done in all the cases. Patients were assured, procedure was explained & written consent was taken in patient's language. Clinical examination like consistency, mobility, tenderness & measurements done. Instruct the patient not to speak /deglutinate during the procedure.

Under all aseptic precautions needle is introduced attached with 10 ml disposable syringe, with minimal negative pressure material is aspirated. Material is expelled immediately on the slides.

RESULTS

Thyroid lesions constitute total 150 cases which have been studied during a period of 1 year. Majority of cases taken in the present study were seen in middle age group (31- 45 yrs) followed by (46-60 yrs) age group, affecting mainly the female patients (110 cases) than male patients (40 cases).

The Bethesda System Reporting Thyroid Cytology (TBSRTC) categorization was done in all the cytologically diagnosed cases.

Table 2 shows maximum no. of cases under benign category 132 cases (88.0%) which are further sub classified as in [Table 3]. As per Table no.-3 we can see that majority of cases were of colloid goitre. Out of 132 cases, 118 were of colloid goiter, 10 were of Hashimotos thyroiditis, 2 were of Subacute Thyroiditis.

In 118 cases of colloid goitre, 20 cases were subjected to histopathological examination out of which 18 cases were reported colloid goiter, 1 cases were of follicular adenoma & 1 case was thyroglossal cyst which gives diagnostic accuracy of 90%. Histopathology was not done in any case of Hashimotos thyroiditis. 1 case was reported to be thyroglossal cyst in which histopathology was also done & it was reported same on histology giving it 100% accuracy. So, the above data gives the sensitivity & specificity of 90% & 100% respectively.

8 cases were reported to be follicular neoplasm. Of which, 4 were subjected to histopathological examination. Diagnostic accuracy in this case was found to be 71.2%.

Among the n=8 malignant lesions, maximum no. of cases were found to be of papillary carcinoma n=5 cases (62.5%). 3 were subjected to histopathology & reported to be positive with accuracy of 100%.

Next common among malignant lesion reported was anaplastic carcinoma, none was subjected to histopathology, followed by medullary & metastatic carcinoma both having 1 case only. Histopathology was done in 1 case of medullary & reported same giving 100% accuracy. No histopathology was done in cases of metastatic carcinoma. The sensitivity & specificity in malignant lesion was 100 % each.

Table 1: Age and Sex-wise distribution of patients.

Age (years)	Male	Female	Total
10-15	1	5	6
16-30	8	32	40
31-45	15	30	45
46-60	11	30	41
>60	5	13	18
Total	40	110	150

Table 2: Classification of Thyroid Lesions Diagnosed by FNAC Using TBSRTC System.

Lesion	Cases	%
Non-diagnostic/ unsatisfactory-I	2	1.3
Benign-II	132	88.0
Atypia of undetermined significance – III	1	0.6
Follicular neoplasm/ suspicious of follicular neoplasm – IV	5	3.33
Suspicious of malignancy – V	2	1.3
Malignant – VI	8	5.3

Table 3: Further Division of Benign Lesions of Bethesda Category and Malignant Lesions.

Lesion	Cases	%
Benign Lesions (132)		
Colloid Goitre	118	87.8
Hashimotos thyroiditis	10	7.5
Subacute thyroiditis	2	1.5
De Quervains thyroiditis	1	0.7
Thyroglossal cyst	1	0.7
Malignant Lesions (8)		
Papillary carcinoma	5	62.5
Medullary carcinoma	1	12.5
Anaplastic carcinoma	1	12.5
Metastatic carcinoma	1	12.5

DISCUSSION

Thyroid nodules cause apprehension because their behaviour is unpredictable.^[8] Whether thyroid enlargement is diffuse or in the form of nodule; it has to be investigated to rule out the possibility of a neoplasm.^[9] FNA has proven to be an effective management tool in patients with thyroid nodules.

Its main purpose is to provide a rational approach for management and determine the correct surgical procedure

when surgery is required. Various studies on thyroid diseases have estimated that about 42 million people in India suffer from thyroid disorders.^[10]

In the present study, maximum numbers of cases were seen in the age group 31-45 years. Similar observations were seen by Rangaswamy et al^[11] and Gupta et al^[12] which concluded that maximum number of thyroid lesions are seen in age group of 31-40 yrs of age group. However, Yassa et al.^[13] observed maximum number of cases between age group 41 and 50 years. In our study this age group was second most common.

In the present study, maximum thyroid swellings were seen in female patients with M:F ratio being 1:4, which correlates with the observations made by Silverman et al.^[14] - 1:10, Gupta et al.^[12] - 1:11, Handa et al. 1:6.3.^[15] and Yassa et al.^[13] - 1:7.

In the present study, maximum number of cases belonged to the benign category 132 cases (88.0%), 8 cases (5.3%) belonged to malignant. Which is concordant with the study done by Handa et al.^[15] which reported out of total 434 pts, 381 cases (87.7%) were reported to be benign & 31 cases (7.14%) were reported to be malignant. But in other study done by Swamy et al.^[16] reported that same incidence i.e. out of 120 cases of thyroid lesion 100 cases (83.66%) were benign & 20 cases (16.66%) were reported to be malignant, whereas in the study done by Singh et al.^[17] a maximum number of cases belonged to malignant, i.e., 70 cases (57.3%) which was discordant with our study, the reason behind this may be the study was conducted on solitary nodules only.

We have 4 cases (11.4%) of anaplastic carcinoma & histopathology was done in 1 case & reported the same giving the 100% diagnostic accuracy. In other study done by Handa et al.^[15] & Rangaswamy et al.^[11] only 1 case (5.8%) & 2 case (3.5%) respectively was reported to be of anaplastic which on histopathology was also reported to be same so this was discordant with our study.

Sensitivity & specificity in cases of malignant lesions comes out to be 100%. These findings were concordant with studies conducted by Handa et al. & Silvermann et al. which showed sensitivity of 97% & 93% respectively & specificity of 100% & 95.1% respectively.

CONCLUSION

FNAC is regarded as a minimally invasive, cost-effective technique with diagnostic accuracy in the range of 90-99%. The task of convincing clinicians of the value of the technique has been extremely successful since their

expectations of a high level of accuracy have been met.

Therefore, FNAC comes out to be a useful primary investigative modality for evaluation of palpable thyroid nodules. It also helps in distinguishing lesions based on the treatment required.

REFERENCES

1. Abu-Nema T, Ayash K, Tibblin S: The role of aspiration biopsy cytology in the diagnosis of cold solitary nodules, *Br J Surg*. 1987;74:203.
2. Tunbridge WM: The spectrum of thyroid disease in a community. The Wicham Survey. *Clin Endocrinol*. 1997;17:481-493.
3. Clark DP, Faquin WC. *Thyroid Cytopathology*. 2nd ed. New York: Springer; 2010.
4. Manoj G, Savita G, Vedbhushan G. Correlation of fine needle aspiration cytology with histopathology in the diagnosis of solitary thyroid nodule. *J Thyroid Res*. 2010;10:1-5.
5. Shirish C, Neha S, Harsh K, Pagaro P, Charusheela G, Mohit R. Clinicopathological correlation of thyroid nodules.. *Int J Pharm Biomed sci*. 2012; 3(3):97-102.
6. Gita J, Orell SR. Thyroid. In: Orell SR, Sterrett GF, editors. *Fine Needle Aspiration Cytology*. 5th ed. Philadelphia: Churchill Livingstone; 2012.118-55.
7. Sanchez MA, Stahl RE. The Thyroid, Parathyroid, & Neck Masses other than lymph nodes. In: Koss LG, Malamed MR, editors. *Koss Diagnostic cytology & its histopathological bases*. 5th ed. Philadelphia. Lipincott Williams & Wilkins; 2006.1149-86.
8. Bibbo M. *Comprehensive Cytopathology*. 2nd ed. Philadelphia, PA: W.B. Saunders Company; 1997. p. 673.
9. Jo VY, Stelow EB, Dustin SM, Hanley KZ. Malignancy risk for fine-needle aspiration of thyroid lesions according to the Bethesda System for Reporting Thyroid Cytopathology. *Am J Clin Pathol*. 2010;134:450-6
10. Bommanahalli BP, Bhat RV, Rupanarayan R. A cell pattern approach to interpretation of fine needle aspiration cytology of thyroid lesions: A cyto-histomorphological study. *J Cytol*.2010;27:127-32.
11. Rangaswamy M, Narendra K, Patel S, Gururajprasad C, Manjunath G. Insight to neoplastic thyroid lesions by fine needle aspiration cytology. *J Cytol*. 2013;30:23-6.
12. Gupta M, Gupta S, Gupta VB. Correlation of fine needle aspiration cytology with histopathology in the diagnosis of solitary thyroid nodule. *J Thyroid Res*. 2010; 2010:379051.
13. Yassa L, Cibas ES, Benson CB, Frates MC, Doubilet PM, Gawande AA, et al. Long-term assessment of a multidisciplinary approach to thyroid nodule diagnostic evaluation. *Cancer*. 2007; 111:508-16.
14. Silverman JF, West RL, Larkin EW, Park HK, Finley JL, Swanson MS, et al. The role of fine-needle aspiration biopsy in the rapid diagnosis and management of thyroid neoplasm. *Cancer*. 1986; 57:1164-70.
15. Handa U, Garg S, Mohan H, Nagarkar N. Role of fine needle aspiration cytology in diagnosis and management of thyroid lesions: A study of 434 patients. *J Cytol*. 2008;25:13-7
16. Swamy GG, Madhuravani S, Swamy GM. Fine needle aspiration cytology – A reliable diagnostic tool in the diagnosis of thyroid gland enlargements. *Nepal Med Coll J*. 2011;13:289-92.
17. Singh DK, Kumar R, Paricharak SD, Nigam N, Nigam SK. Role of fine needle aspiration cytology in solitary thyroid nodules. *J Evol Med Dent Sci*. 2013;36:6903-14.