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"Role of FNAC in Diagnosing Thyroid Neoplasms - A Retrospective Study"

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Abstract: *Thyroid carcinoma originates from follicular or parafollicular thyroid cells. These cells give rise to both well-differentiated cancers (i.e., papillary and follicular) and analastic thyroid cancer. The second cell type, the C or parafollicular cell, produces the hormone calcitonin and is the cell of origin for medullary thyroid carcinoma (MTC).FNAC is an effective veritable tool for the diagnosis of thyroid lesions in various age groups. Based on the cytology findings, patients can be followed in cases of benign diagnosis and subjected to surgery in cases of malignant diagnosis thereby decreasing the rate of unnecessary surgery. The aim of our study is to know the prevalence of thyroid cancer in the past five years and the role of FNAC in its diagnosis as well as knowing the limitations of FNAC in the definitive diagnosis of malignant neoplasm of the thyroid gland. Patients who visited the outpatient department of our centre with complaints of thyroid swelling were sent for cytological examination in the cytopath section of department of pathology. FNA was performed in these patients by taking informed consent and diagnosis were made by the consultant cytopathologists. malignant neoplasm were diagnosed in 4.2% (p value<0.05).*

Key Words: *carcinoma, neoplasm, FNAC.*

I. Introduction

Solitary thyroid nodule is defined clinically as the localised thyroid enlargement with apparently normal rest of the gland. Solitary thyroid nodule is a common entity. Majority of these nodules are benign. The main goal of evaluating these nodules is to identify the ones with malignant potential. Thyroid cancer is the most common form of endocrine malignancy.[1] The most common presentation of thyroid cancer is a newly diagnosed palpable nodule or an increase in size to a pre-existing nodule.[2] As for most head and neck cancers, early stage diagnosis and management often lead to better outcomes.[3] It is therefore of paramount importance that these changes are investigated correctly. It has been estimated that between 5-10% of thyroid nodules are malignant.[4]. Recent British Thyroid Association/Royal College of Physicians (2007) and the American Association of Clinical Endocrinologists (AACE)/Association Medici Endocrinologi (AME)(2006) publications implicate fine needle aspiration cytology (FNAC) as the early investigation of choice for thyroid cancer.[1,5] . Studies have suggested a high sensitivity and specificity for predicting thyroid malignancies averaging 83% [5] and 92% respectively.[6–9] It is also well recognized that certain thyroid pathologies have similar cytological features which make diagnosis extremely difficult [10].

Thyroid cancers can be classified according to Their histopathological characteristics.[11][12] The following variants can be distinguished (distribution over various subtypes may show regional variation):Papillary thyroid cancer (75% to 85% of cases[11]) – often in young females – excellent prognosis. May occur in women with familial adenomatous polyposis and in patients with Cowden syndrome. Follicular thyroid cancer (10% to 20% of cases[13]); occasionally seen in patients with Cowden syndrome.Medullary thyroid cancer (5%[13] to 8% of cases)- cancer of the parafollicular cells, often part of multiple endocrine neoplasia type 2.[14] Poorly differentiated thyroid cancer Anaplastic thyroid cancer (less than 5% of cases[13]) is not responsive to treatment and can cause pressure symptoms.Others Thyroid lymphoma,Squamous cell thyroid carcinoma,Sarcoma of thyroid. The follicular and papillary types together can be classified as "differentiated thyroid cancer".[15] These types have a more favorable prognosis than the medullary and undifferentiated types.[16]

The majority of the existing evidence relates to the sensitivity of these investigations in assessing a thyroid nodule or neck lump, regardless of the final histology. Therefore, the main aim and significance of our study is to ascertain the diagnostic yield of FNAC in patients with proven thyroid cancer, within a local geographic area. This data would then be compared to any existing evidence pertaining to the usefulness of FNAC in the diagnosis of thyroid cancer.

II. Materials and methods

This is a retrospective study done in a period of yrs 2006-2014 in cytopath section of Pathology Department in coherence with dept of surgery and medicine of our center. Total 14405 FNA were done during this period out of which 791 cases were diffuse /nodular thyroid enlargement. Informed consent was taken from the patients. The records of these 791 patients who undergone FNA during study period were retrieved & information about age, sex, cytomorphological diagnosis were recovered and corresponding original studies were reviewed (corresponding histopathology was not available in most of the cases in our setup). FNAC in all these patients was performed by experienced cytologists without local/general anaesthesia with 22-25 g needle. The procedure was well tolerated by the patients without any complication. Air dried smears were prepared from aspirated material and stained with MGG following recommended steps. Cytological smears were reviewed according to standard guidelines and diagnosis was accordingly classified and correlated with age and sex to explore the pattern and association.

The data from the past nine years were retrieved, compiled, summarized and analyzed statistically using frequency distribution and percentage proportion.

III. Results

In our study total 791 cases were included out of which 761 were adequate for reporting. Out of 791 cases 3.7% unsatisfactory, 79.8% benign, 12.01% suspicious and 4.2% malignant (p value < 0.05). The malignant neoplasm were further classified into various categories (table no.1). The age and gender wise distribution of total thyroid lesions is shown in table 2 & 3.

IV. Discussion

FNAC was first proposed in 1904 to sample lymph node in sleeping sickness. In 1930 Martin & Ellis described it as a valuable step in the workup of neck lumps included in thyroid nodule[17].

Cytological categorization of thyroid lesions into benign and malignant is very helpful to clinicians in the management of patients with specific reference to the need of thyroid surgery, as most of the benign conditions can be managed medically. Systems range from three to six or more diagnostic categories. The system currently and most commonly used (Bethesda System) contains six categories as follows: benign, lesion (atypia) of undetermined significance, follicular neoplasm, suspicious for malignancy, malignant, and non-diagnostic. The classification system used in this article contains four diagnostic categories: benign, suspicious, malignant, and insufficient. Out of the 791 cases reported over the past five years 761 were adequate for reporting. Out of those 761 cases they were divided into benign and malignant lesions. As mentioned before, many studies show that 2–15% of FNAC are unsatisfactory, 50–70% benign, 15–30% suspicious, and 5–10% are malignant.

In our study of 791 FNACs, showed 3.7% unsatisfactory, 79.8% benign, 12.01% suspicious and 4.2% malignant. Our results are in the ranges reported by others.

The p value for malignant cases diagnosed by FNAC is less than 0.05 which shows the result is statistically significant.

Suspicious category included- Follicular Adenoma & Follicular Neoplasm and malignant category included- Papillary Carcinoma, Anaplastic Carcinoma & Medullary Carcinoma. Kumar et al in their study on 89 patients with enlarged thyroid gland reported a sensitivity of 100% & Diagnostic accuracy of 97.7% [18]. Our study and other expertise [19] strongly suggest that FNAC is more specific than sensitive in detecting thyroid malignancy, therefore it should be adapted as a reliable initial diagnostic test in all tertiary hospitals like ours, in developing countries like India. In the published data[20,21,22] the sensitivity, specificity and accuracy of thyroid FNAC in detecting malignancy ranges from 52-86%,52-86.6% and 79.1% respectively.

No metastasis was reported at our centre in the past five years. From the above study it can be noted that from FNA the malignant neoplasm of the thyroid gland were maximally classified as follicular neoplasm, which showed pleomorphism, nuclear crowding, grooving, nucleoli and high nuclear cytoplasmic ratio. Hence, histopathological correlation is needed for the definitive diagnosis of the various malignant lesions. Since, India is a developing country and many tertiary care centers don't have enough facilities and also due to unawareness of the patient they are not properly traced which results in failed correlation of cytological findings with histopathological examination of the thyroid lesions.

V. Conclusion

FNA is a veritable tool for initial diagnostic test for pre operative evaluation of patients with thyroid swelling. It's an invasive safe, quick and easily performed procedure and should be promoted by clinicians as primary modality in the evaluation of thyroid lesions. FNAC is an important adjunct to the careful physical examination and evaluation of patients with thyroid swelling.

VI. Tables

Table No.1. Spectrum Of Different Thyroid carcinoma In 9 Years.

S.No	Diagnosis	Total no. of cases	Percentage (%)
1.	Papillary carcinoma	15	1.97
2.	Anaplastic carcinoma	11	1.44
3.	Medullary carcinoma	08	1.05
5.	Follicular neoplasm	65	8.54
6.	Follicular adenoma	30	3.94

Table no. 2 : Age wise distribution of number of cases presenting with thyroid nodule in past 9 years.

Age group	Number of cases	Percentage
< 20 years	98	12.38%
21- 40 years	498	62.95%
41-60 years	104	13.14%
>60 years	91	11.50%

Table No.3 Male & Female distribution.

Gender	Total no. of cases	Percentage (%)
Male	279	64.7
Female	512	35.2

VII. Figures

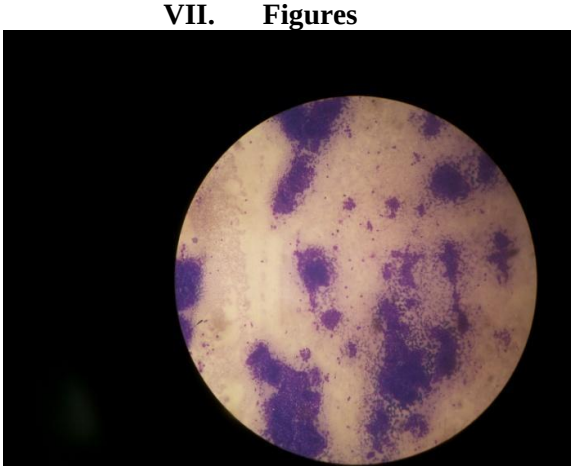
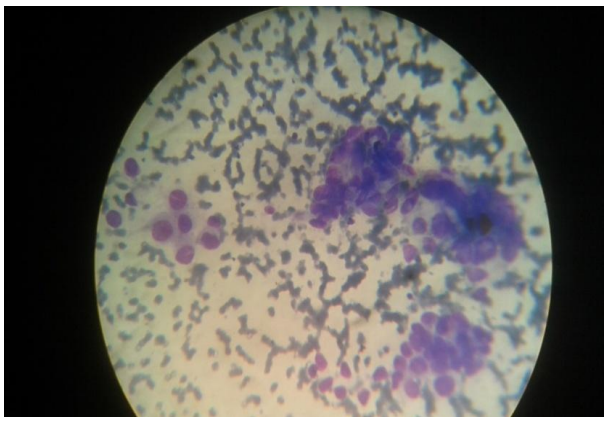


Figure Showing Papillary Carcinoma MGG 10X



Follicular Neoplasm MGG 40X.

References

[1]. Perros P, editor. Report of the Thyroid Cancer Guidelines Update Group. 2nd ed. London: Royal College of Physicians; 2007. British Thyroid Association, Royal College of Physicians. Guidelines for the management of thyroid cancer.

[2]. Cancer Statistics; Registrations [internet] The Office for National Statistics. [Last updated on 2005; Last cited on 2009 June 24]. Available from: http://www.statistics.gov.uk .

[3]. Guidance on cancer services: Improving outcomes in head and neck cancers - the manual [internet]National Institute of Clinical Excellence. [Last Updated on 2004; Last cited on 2008 Aug 24]. Available from http://www.nice.org.uk/guidance/index.jsp%action = byIDando = 10897 .

[4]. Morris LF, Ragavendra N, Yeh MW. Evidence-based assessment of the role of ultrasonography in the management of benign thyroid nodules. World J Surg. 2008;32:1253–63. [PubMed]

[5]. Cobin RH, Gharib H, Bergman DA, Clark OH, Cooper DS, Daniels GH, et al. AACE/AAES medical/surgical guidelines for clinical practice: management of thyroid carcinoma.American Association of Clinical Endocrinologists. American College of Endocrinology. Endocr Pract. 2001;7:202–20. [PubMed]

[6]. Gharib H. Fine-needle aspiration biopsy of thyroid nodules: Advantages, limitations, and effect. Mayo Clin Proc. 1994;69:44–9. [PubMed]

[7]. Castro MR, Gharib H. Thyroid fine-needle aspiration biopsy: Progress, practice, and pitfalls. Endocr Pract.2003;9:128–36. [PubMed]

[8]. Gharib H, Goellner JR. Fine-needle aspiration biopsy of thyroid nodules. Endocr Pract. 1995;1:410–17.[PubMed]

[9]. Jeffrey PB, Miller TR. Fine-needle aspiration cytology of the thyroid. Pathology (Phila) 1996;4:319–35.[PubMed]

[10]. Howlett DC, Harper B, Quante M, Berresford A, Morley M, Grant J, et al. Diagnostic adequacy and accuracy of fine needle aspiration cytology in neck lump assessment: results from a regional cancer network over a one year period. J Laryngol Otol. 2007;121:571–9. [PubMed]

[11]. "Thyroid Cancer Treatment – National Cancer Institute". Retrieved 2007-12-22.

[12]. "Thyroid cancer". Retrieved 2007-12-22.

[13]. Chapter 20 in: Mitchell, Richard Sheppard; Kumar, Vinay; Abbas, Abul K.; Fausto, Nelson. Robbins Basic Pathology. Philadelphia: Saunders. ISBN 1-4160-2973-7. 8th edition.

[14]. Schlumberger M, Carlomagno F, Baudin E, Bidart JM, Santoro M (2008). "New therapeutic approaches to treat medullary thyroid carcinoma". Nat Clin Pract Endocrinol Metab **4** (1): 22–32. doi:10.1038/ncpendmet0717. PMID 18084343.

[15]. Nix P, Nicolaides A, Coatesworth AP (2005). "Thyroid cancer review 2: management of differentiated thyroid cancers". Int. J. Clin. Pract. **59** (12): 1459–63. doi:10.1111/j.1368-5031.2005.00672.x. PMID 16351679.

[16]. Nix PA, Nicolaides A, Coatesworth AP (2006). "Thyroid cancer review 3: management of medullary and undifferentiated thyroid cancer". Int. J. Clin. Pract.**60** (1): 80–4. doi:10.1111/j.1742-1241.2005.00673.x. PMID 16409432.

[17]. Guhamallick et al. cytodignosis of thyroidusefulness & pitfalls: a astudy of 288 cases. J cytol2008;25:6-9.

[18]. Kumar S. aquil et al. role of FNAC in thyroid diseases . j surg.Pk2008;13:22-5.

[19]. Bukhari MH et al. an update audit of fine needle aspiration cytology procedure of solitary thyroid nodule. Diagn cytopathology2008;36:104-12.

[20]. Giuseppe A, Maria P, Italo N. Fine needle aspiration cytology of thyroid gland disease. The International Academy of cytology; March-April, 1990, vol 34, No.2.

[21]. Cap J, Rehorkova P, Hovorkova E, Kerekes Z, Pohnetelova D. Sensitivity and specificity of fine needle aspiration biopsy of thyroid gland: clinical point of view. Clinical endocrinology, 1999, 51: 509-515p.

[22]. Holleman F, Hoekstra J, Ruitenberg HM.Evaluation of fine needle aspiration cytology in the diagnosis of thyroid nodules. Cytopathology. 1995; 6: 175-186.