“Role of FNAC in Diagnosing Thyroid Neoplasms - A Retrospective Study”

1Dr. Jyoti Priyadarshini Shrivastava, 2Dr. K.S Mangal, 3Dr. Poonam Woike, 4Dr. Priyesh Marskole, 5Dr. Rajesh Gaur

1. Assistant Professor, Department Of Pathology
2. Associate Professor, Department Of Pathology
3. Post Graduate Student, Department Of Pathology
4. Assistant Professor, Department Of Community Medicine
5. Professor & Head, Department Of Pathology.

Author for Correspondence- Dr. Jyoti Priyadarshini Shrivastava
Residence-155, Saraswati Nagar, University Road, City Centre, Gwalior, M.P-474011

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 anaplastic 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 verifiable 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. The most common presentation of thyroid cancer is a newly diagnosed palpable nodule or an increase in size to a pre-existing nodule. As for most head and neck cancers, early stage diagnosis and management often lead to better outcomes. 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. 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. Studies have suggested a high sensitivity and specificity for predicting thyroid malignancies averaging 83% and 92% respectively. It is also well recognized that certain thyroid pathologies have similar cytological features which make diagnosis extremely difficult.

Thyroid cancers can be classified according to Their histopathological characteristics. The following variants can be distinguished (distribution over various subtypes may show regional variation): Papillary thyroid cancer (75% to 85% of cases) – 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); occasionally seen in patients with Cowden syndrome. Medullary thyroid cancer (5% to 8% of cases); cancer of the parafollicular cells, often part of multiple endocrine neoplasia type 2. Poorly differentiated thyroid cancer Anaplastic thyroid cancer (less than 5% of cases) 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". These types have a more favorable prognosis than the medullary and undifferentiated types.
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[15].

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 nondiagnostic. 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%, 65-86.6% 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.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Number of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20 years</td>
<td>98</td>
<td>12.38%</td>
</tr>
<tr>
<td>21-40 years</td>
<td>498</td>
<td>62.95%</td>
</tr>
<tr>
<td>41-60 years</td>
<td>104</td>
<td>13.14%</td>
</tr>
<tr>
<td>&gt;60 years</td>
<td>91</td>
<td>11.50%</td>
</tr>
</tbody>
</table>

Table No.3 Male & Female distribution.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total no. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>279</td>
<td>64.7</td>
</tr>
<tr>
<td>Female</td>
<td>512</td>
<td>35.2</td>
</tr>
</tbody>
</table>

VII. Figures

Figure Showing Papillary Carcinoma MGG 10X

Follicular Neoplasm MGG 40X.
“Role of FNAC in Diagnosing Thyroid Neoplasms - A Retrospective Study”

References


