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A Clinical study on Thyroid Nodules with their Cytological and Histopathological Patterns of Presentation

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Abstract: ***Neck swellings are readily apparent and are of great cosmetic concern. Swellings in the neck may arise from the Thyroid gland, lymph nodes, blood vessels, nerves, trachea, oesophagus, larynx, pharynx, muscles, soft tissues and skin. A study of 125 cases of neck masses were studied from November 2022 to November 2023. Among these, 74 cases were of thyroid origin and the rest were of non - thyroid origin. In the present study age and sex distribution incidence and diagnostic accuracy of Cytology and Histopathology for thyroid swellings is studied. In our study, incidence of neck swellings of thyroid origin was 59.2%. Thyroid nodules are more common in women.90 - 95% of thyroid swellings are benign and around 5 - 10%are malignant. Male to female ratio ranges from 1: 10 for Nodular Goitre. The common presentation of thyroid swelling is multinodular goitre, adenoma of thyroid. The accuracy of FNAC in our study is 92.3%. Early detection of a thyroid nodule will lead to different clinical approach from detection of follicular adenoma or papillary carcinoma. The technique of FNAC is simple and cost - effective, it is an effective screening test for carcinoma.***

Keywords: Thyroid Nodule, Adenoma thyroid, Fine Needle Aspiration Cytology (FNAC), Papillary Carcinoma Thyroid, Follicular Carcinoma Thyroid

1. Introduction

Thyroid nodules contribute significantly to the caseload in the out - patient and in patient units. In addition to physical deformity, thyroid swellings may also cause pressure symptoms on trachea and oesophagus depending upon the size and type of swelling. Sometimes the nodule of the thyroid may be due to underlying malignancy in which case prior FNAC will help the surgeon to decide the modality of treatment and the type of surgery depending upon the type of carcinoma, follicular or papillary carcinoma.

2. Materials and Methods

A Descriptive study of thyroid swelling was carried out at CMR Institute of Medical Sciences, Medchal between 1st November, 2022 – 30th November 2023. Source of data is from the in patient records during the study period. Various thyroid swellings were studied for the history, clinical presentation. All cases were investigated with FNAC, ultrasound, thyroid function tests, Routine blood and urine tests. They underwent surgery and the specimen was sent for histopathological examination. The incidence, age and sex distribution of thyroid nodules for different pathological entities was studied. The FNAC reports were compared with histopathological reports and analysed.

3. Results

In our study, out of the 125 cases operated for neck swellings, 74 swellings were of thyroid origin and remaining cases were neck swellings other than thyroid. The incidence of neck swellings of thyroid is 59.2% and incidence of neck swellings other than thyroid is 40.8%.

Table 1: Peak Age incidence, Sex and Incidence of different thyroid nodules:

BENIGN CASES (70)	Total	Male	Female	Incidence	Peak Age Incidence
Multinodular goitre	33	3	30	44.59%	30 - 39 yrs
Adenoma of thyroid	24	2	22	32.43%	30 - 39 yrs
Hashimoto's thyroiditis	8	1	7	10.81%	30 - 39 yrs
Colloid goitre	4	0	4	5.40%	40 - 59 yrs
Thyroglossal cyst	1	1	0	1.35%	0 - 9 yrs
MALIGNANT CASES (4)					
Papillary carcinoma	3	1	2	4.05%	10 - 59 yrs
Follicular carcinoma	1	0	1	1.35%	60 - 69 yrs
Medullary carcinoma and Anaplastic carcinoma	0	0	0	0.00%	

Out of 74 cases of thyroid nodules, the following observations were made. Among thyroid nodules, benign nodules were 70 contributing to 94.59% and malignant nodules were 4 contributing to 5.40%. Multinodular goitre contributed to 44.59% of caseload with peak age incidence 30 - 39 yrs, Adenoma of thyroid constituted 32.43% of cases with peak age incidence 30 - 39 yrs, Hashimoto's thyroiditis was seen contributing to 10.81% of cases with peak age incidence 30 - 39 yrs, Colloid goitre was seen in 5.40% of cases peak age incidence 40 - 59yrs, thyroglossal cyst seen in only 1.35% of cases with peak age incidence 0 - 9 yrs.

Figure 1: Patient presenting with Multinodular goiter

Among malignant swellings which were 4 in number, papillary carcinoma of thyroid seen in 3 cases contributing to 4.05% of thyroid nodules. Follicular carcinoma was seen in one case constituting 1.35% cases and medullary and Anaplastic carcinoma seen in zero cases. The incidence of thyroid carcinoma in our study is highest for papillary carcinoma thyroid which is 75%. The incidence of follicular carcinoma is 25%. Incidence of malignancy is 3.2% of the total neck swellings

All cases investigated with FNAC, ultrasound and underwent surgery and specimen is sent for histopathological examination. The results of FNAC are compared with histopathological reports and analysed. The accuracy and sensitivity of FNAC in our study is 92.30%.

Table 2: Analysis of FNAC of Different Thyroid Swellings

No. of FNAC	False Negative	False Positive	True positive	True Negative	Sensitivity	Specificity	PPV	NPV
74	5	4	60	14	92.30%	77.7%	93.75%	73.6%

The results of different thyroid nodules (74), the no of cases of true positive is 60 and false positive is 4. The true negatives are 14 and false negatives are 5 with a sensitivity of the test being 92.3% and specificity of 77.7%. PPV 93.75% and NPV of 73.6%.

4. Discussion and Conclusion

Thyroid nodules are commonly seen in women, most of the thyroid swellings are benign and only around 5% are malignant. Male to female ratio for different thyroid swellings range from 1: 11 (adenoma of thyroid) to 1: 10 (multinodular goitre). Peak age incidence for multinodular goitre, adenoma of thyroid and hashimotos thyroiditis is around 30 - 39 yrs, whereas for thyroglossal cyst it is 0 - 9 yrs. The common type of presentation of thyroid swelling is multinodular goitre followed by adenoma of thyroid. Papillary carcinoma of thyroid is seen with peak age incidence of 10 - 59 yrs whereas follicular carcinoma is seen around 60 - 69 yrs. The incidence of neck swellings of thyroid is 59.2%. Among thyroid neck swellings benign swellings were 70 contributing to 94.59% and malignant swellings were 4 contributing to 5.40% of the total malignant nodules. Incidence of malignancy is 3.2% of the total neck swellings. FNAC is inexpensive and is performed on outpatient basis and has very few complications like absence of tumor implants along the needle tract. Percentage of inadequate specimen in FNAC ranges from 0 - 25%. The sensitivity of FNAC in our study being 92.30% and specificity of 77.7%.

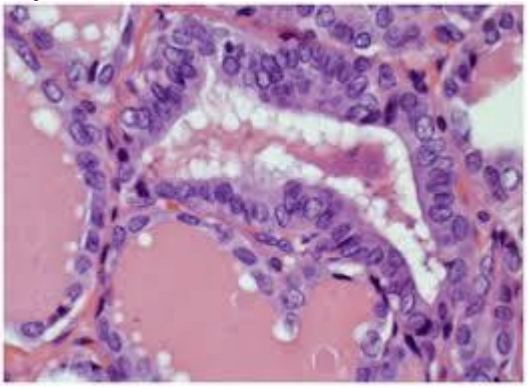

Figure 2: Histopathology of Papillary Carcinoma of Thyroid

Among the thyroid nodules upto 20% of nodules that are surgically resected contain malignancy. Some people of thyroid carcinoma die of delayed diagnosis, false negative FNAC and inadequate surgery. Thyroid surgeries carry certain risks. Hence accurate screening tests are needed to select the nodules that require surgery. Very few diagnostic tests differentiate benign and malignant thyroid swellings. Ultrasound of thyroid can detect solid from cystic lesions but all cystic lesions are not benign. Thyroid isotope scan using technetium 99, detect hot or cold nodule. Hot nodules are functioning and usually benign but cold nodules are non - functioning and around 20% may be malignant. Thallium scans also give high false positive results and carries high radiation burden and should be used only for follow up after thyroid malignancy. It is a useful procedure for the detection of type of thyroid nodule, whether it requires surgery, whether it is malignant and the type of surgery needed.

Continuous research in the field of immunohistochemistry is proving a game changer in the early detection of neoplasms. TTF - 1 for follicular cells, Markers directed at papillary carcinoma and include cytokeratin 19,, S - 100 protein, HBME - 1, galectin 3, Ret oncoprotein. The findings are generally promising although some studies demonstrated inconclusive or conflicting results. Immunoexpression is a supplementary test in the diagnosis of thyroid malignancies, it does not however replace the conventional histopathological examination. It helps in the management of patients with thyroid nodules by reducing unnecessary surgical resection of benign nodules although much research is required in this area.

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