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Pathology

Corelation of FNAC with Histopathology in the Diagnosis of Solitary Thyroid Nodule

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Abstract **Original Research Article**

A Solitary thyroid nodule is common entity in thyroid patients, attending endocrine clinic or surgery OPD. The major concern in STN is either cosmetic reasons in young ladies or some pressure symptoms of it. The pathological evaluation is most important as STN has malignant potential in many patients. Aim of our present study is to analyse FNAC and histopathological results and above all assess accuracy of FNAC in diagnosis of solitary thyroid nodule.
Keywords: Fine Needle Aspiration Cytology, Histopathology, Solitary thyroid Nodule.

INTRODUCTION

FNAC is now universally accepted as a quick, cost effective diagnostic technique with minimal complications & investigation of choice in the diagnosis of all most all palpable thyroid lesions. Being cosmetically important, Surgeons prefer FNAC in female thyroid patients in surgical decision making. Solitary thyroid nodule, on clinical examination appears as a single nodule in otherwise normal thyroid gland. The spectrum of thyroid lesions presenting as Solitary Thyroid Nodule ranges from Autoimmune Thyroiditis to Malignant Thyroid Tumors [1]**.** A Solitary thyroid nodule has a high risk of malignancy (10-20%) than multiple palpable nodules of a multinodular goiter (5%) [2]. The present study is prospective one & was carried out to review the data regarding prevalence of Solitary Thyroid Nodule & analyse its distribution with age & sex, and correlating the FNAC findings with Histopathological study.

MATERIALS & METHODS

This study was conducted between July 2017 to June 2019 in the Department of Pathology, MKCG Medical College & Hospital taking all goitrous lesions into consideration and selecting only palpable solitary thyroid nodules for FNAC and further biopsy study. It included 50 cases of Solitary Thyroid nodule, fulfilling all inclusion criteria: Patients of both Sex in all age groups clinically presenting as palpable Solitary Thyroid Nodules. Exclusion criteria of this study being Patients of Multinodular Goitre & Non-thyroidal neck masses. A detailed clinical history was taken, thorough examination of data regarding USG findings (if any) & other investigations was done. FNAC was performed in all cases using 5ml Dispovan and 24 gauge needle with all precautions for adequate material yield & minimum blood contamination. Finally the cytology results were correlated with respective histopathological findings & statistical analysis was performed.

OBSERVATION

Our study evaluated 50 cases of Solitary thyroid nodule and fulfilling the adequate criteria (Inclusion & Exclusion). There were 14 males & 36 females with M:F of 1:2.5. The age of the patients ranged from 25 to70 years with maximum number of patients in 31-40 years age group (36%). FNAC revealed maximum number of cases as Nodular Goitre (16), followed by Benign cystic Nodule (12), Follicular Neoplasm (10), Papillary Carcinoma (10), Medullary Carcinoma (01) & Suspicious for Papillary Carcinoma Thyroid (01). In our Biopsy study, 16 cases were Colloid Nodule, 10 cases were Benign cyst and 1 case of Hashimoto's Thyroiditis in Non-Neoplastic Category Lesions, while Neoplastic Lesions were 8 cases of Follicular Adenoma followed by 12 cases of Papillary

Carcinoma, 3 cases of Medullary Carcinoma, 1 case of Hashimoto's Thyroiditis.

The diagnostic value of FNAC in this study was as follows:

46 cases were True Positive (92%) [% accuracy on FNAC] while 4 cases were False Negative (8%).

Table-1: Distribution of Study Group according to Age & Sex

Age group (yrs)	Male	Female	Total	Percentage (100)
21-30	02	06	08	08
31-40	08	10	18	18
41-50	00	11	11	11
51-60	04	08	12	12
61-above	0	01	01	01
Total	14	36	50	50

Table-2: Prevalence of Solitary Thyroid Nodule

Total No. of thyroid FNAC cases	Number of solitary thyroid nodules
400	50
Percentage	12.5%

The Prevalence of Solitary Thyroid Nodule among all cases of Thyroid FNAC was 12.5% in present study.

Table-3: On break up of Solitary Thyroid Nodule Cases as per FNAC Reports

FNAC Report	No.of cases	Percentage
Nodular Goitre	16	32%
Benign thyroid Cyst	12	24%
Follicular Neoplasm	10	20%
Papillary Carcinoma	10	20%
Medullary carcinoma	01	02%
Suspicious for PCT	01	02%
TOTAL	50	100%

FNAC report shows majority of our cases belonged to Nodular goiter (16 cases-32%), followed by benign thyroid cyst (12 cases -24%) under benign category. Follicular neoplasm and papillary carcinoma constituted 10 cases each i.e 20 % under malignant category, followed by 1 case each of medullary carcinoma (2%) and 1 case suspicious for papillary carcinoma (2%).

Table-4: Histopathological Diagnosis of the study Group

Histopathological diagnosis	No.of cases	percentage
Colloid Goitre	16	32%
Benign thyroid Cyst	10	20%
Hashimoto's thyroiditis	01	02%
Follicular Adenoma	08	16%
Papillary carcinoma	12	24%
Medullary carcinoma	03	06%
TOTAL	50	100%

In our study group colloid goiter (colloid nodule) was the most common histopathological finding (32%) of the cases. Malignant tumours in our study were 15 cases which is 30 % of the study group.

Table-5: Table Showing FNAC and Hisopathological Corelation

Diagnosis	FNAC	Histopathology
Nodular goitre	16	16
Benign thyroid cyst	12	10
Follicular Neoplasm	10	08
Papillary carcinoma	10	12
Medullary carcinoma	01	03
Suspicious for PCT	01	0
Hashimotos thyroiditis	0	01
TOTAL	50	50

12 Cases proved on FNAC as benign thyroid cyst, 2 cases showed discordance on histopathology, with those 2 cases showing features of papillary thyroid carcinoma.

Out of 10 cases of proven follicular neoplasm on FNAC 2 cases showed discordance and was proved as medullary carcinoma on biopsy.

Another case that was suspicious for papillary thyroid carcinoma was confirmed as Hashimotos thyroiditis on biopsy.

Table-6: Accuracy rate of FNAC

Results	True positive	False negative	False positive	Total
No.of cases	46	04	0	50
Percentage	92%	8%	0	100%

Overall accuracy rate of FNAC was 92 % that was achieved in cytological diagnosis of a solitary nodule.

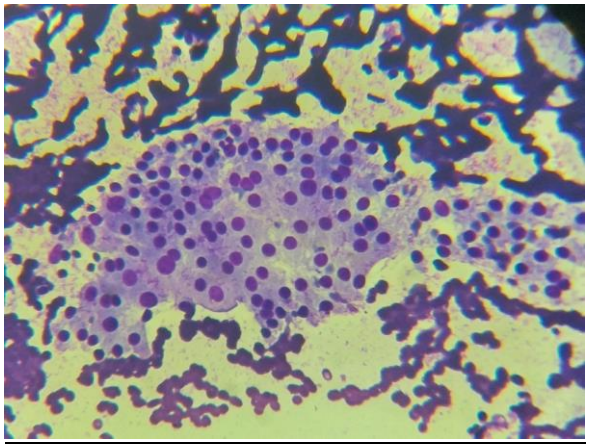

Fig-1: FNAC 100x – Nodular Goitre

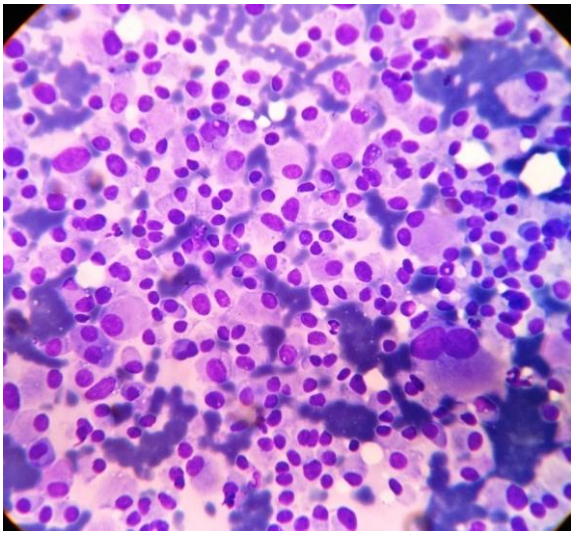

Fig-2: 100x- FNAC- Medullary carcinoma of thyroid Showing Plasmacytoid cells

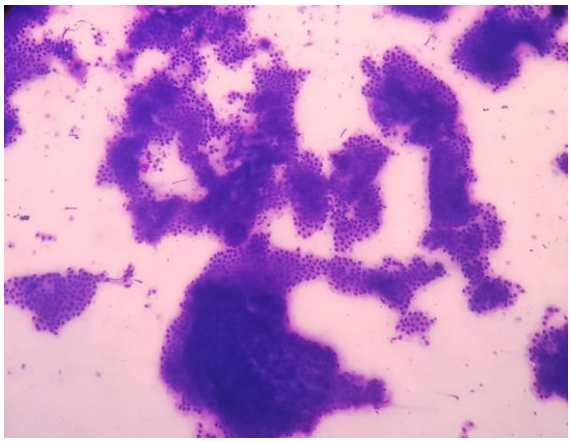

Fig-3(a): FNAC Papillary carcinoma of thyroid

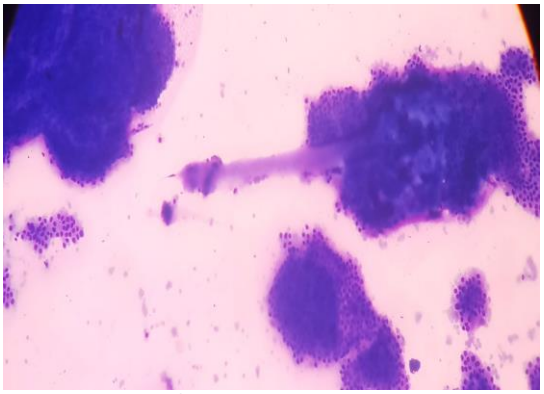

Fig-3(b): Papillary fronds with characteristics chewing gum colloid

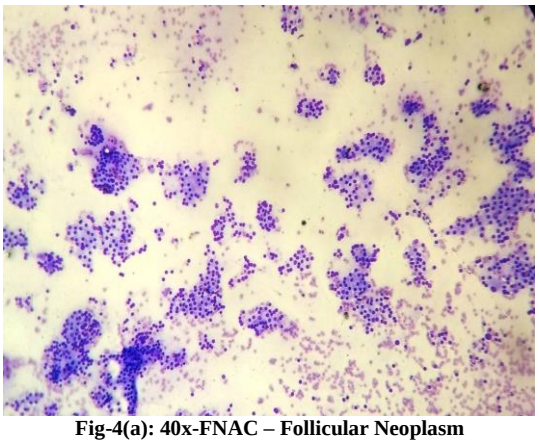

Fig-4(a): 40x-FNAC – Follicular Neoplasm

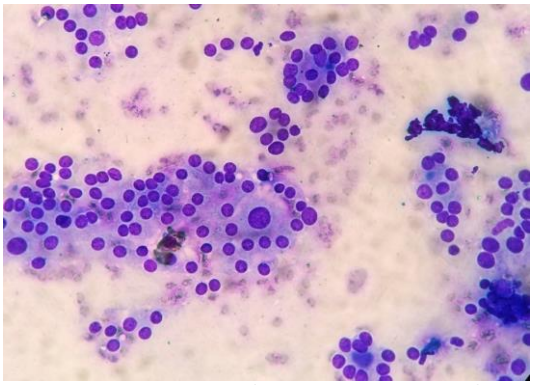

Fig-4(b): 400x- FNAC- Microfollicular arrangement of thyroid follicular cells

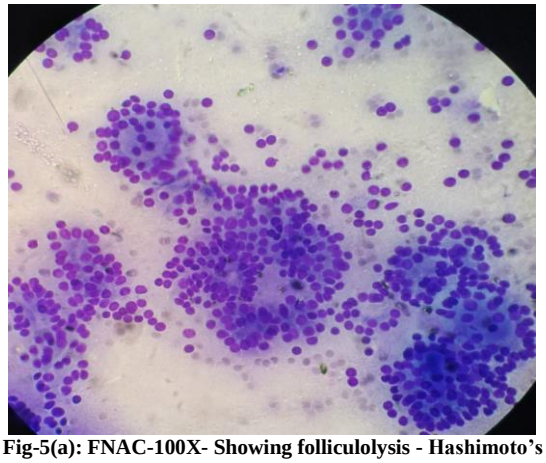

Fig-5(a): FNAC-100X- Showing folliculolysis - Hashimoto's thyroiditis

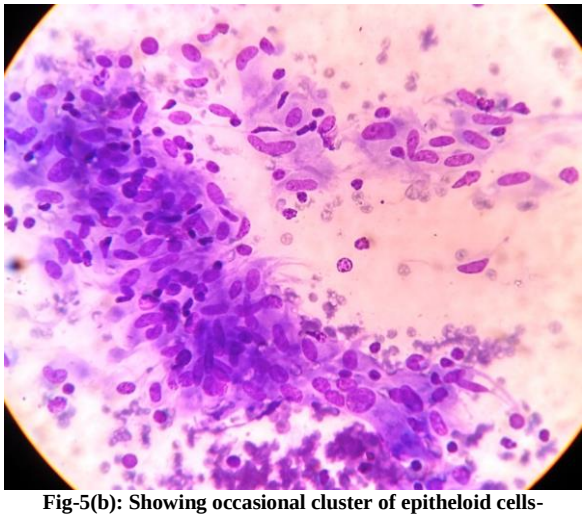

Fig-5(b): Showing occasional cluster of epitheloid cells- Hashimotos thyroiditis

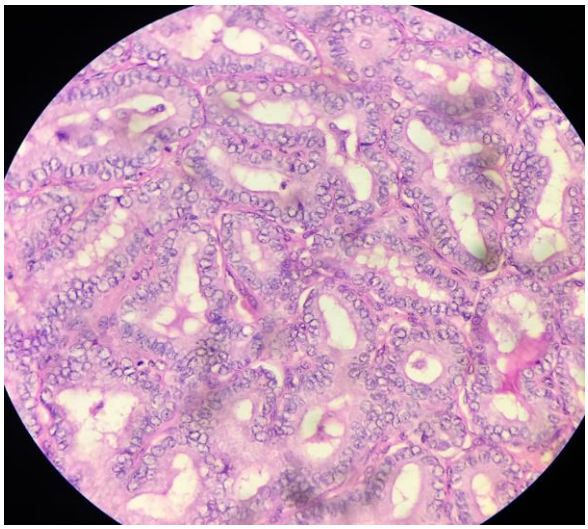

Fig-6: 100X- Histopathology- Showing features of Papillary carcinoma

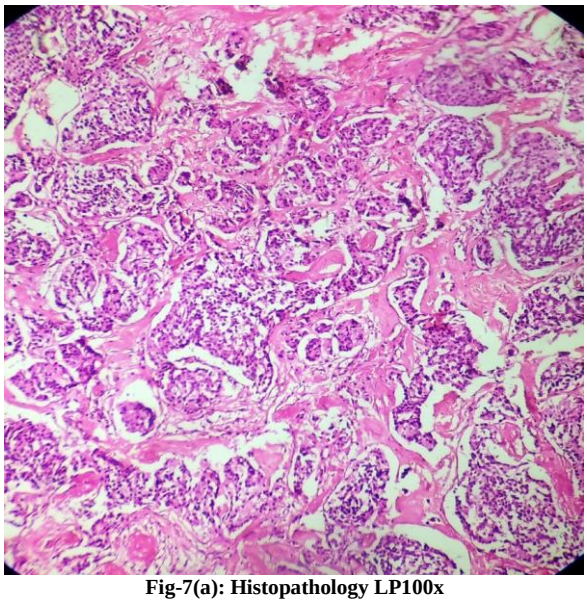

Fig-7(a): Histopathology LP100x

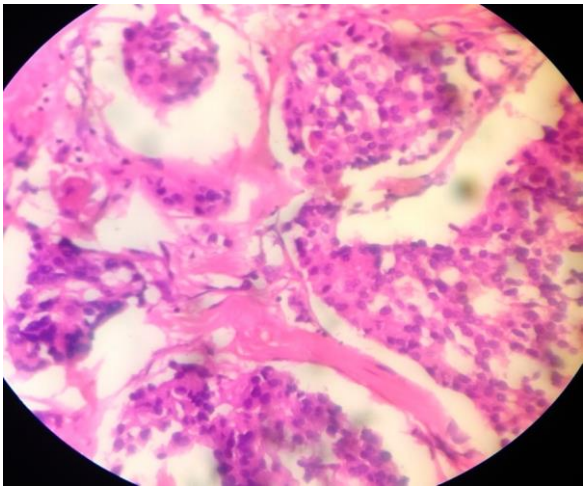

Fig-7(b): Histopathology 400x- Medullary carcinoma thyroid

DISCUSSION

Solitary thyroid nodule represents thyroid pathology in about 12.5 % of cases. Out of 50 patients 14 cases were males and 36 were females, with ratio of males:females being 1:2.5 that was concordant with the studies done by Pandey *et al*., [3] and Khan *et al*., [4]. Youngest patient belonged to the age group of 25 years and oldest was 70 years. Majority of patients belonged to the 4th decade that was similar to the study done by Bhansali SK [5], and Framingham study.

Amongst FNAC reports, 38 cases were non neoplastic (76%) that was nearly similar to studies done by Korah [6] that reported benign lesions to be 69%. Nodular goitre was the most common finding among the benign lesions that constituted (32 % of cases) which was concordant with the studies done by Gupta *et al.*, [7] and Saddique [8]. The next common FNAC finding was benign thyroid cyst in 12 cases (24%) which is at variance from study done by Abu-salem having thyroid cyst 43 cases (8.3%) [9]. The malignant cases were about 12 (24%) which is in cordance with the study done by Gupta et al (26%) and Baloch study (29%) [10].

Among the malignant diseases, papillary carcinoma was the most common entity (10 cases) accounting upto 20 % of cases, which differed from the study conducted by Pai where the number of malignant cases were 15 (23% cases) [11]. On histopathology non neoplastic lesions were (35 cases 70%) and neoplastic lesions (15 cases 30%) while in a study conducted by Mehmood [12] histopathology revealed non neoplastic 79.49 % and neoplastic lesions 20.51%. On histopathology Follicular adenoma was seen in (8 cases - 16%) while in a study done by Tabaqchali [13] Follicular adenoma was seen in 60 patients (25.10%).

In the present study correlation of FNAC reports with final histopathological findings showed four cases that were missed by FNAC – 2 were occult primary carcinoma measuring 1 cm and less than 1 cm

in dimension. This discordance is due to under diagnosis of papillary carcinoma with cystic degeneration. Occult Papillary carcinoma is only a histopathological diagnosis. This result is comparable to Batra *et al.*, [14].

6 out of 8 carcinomas were missed by FNAC. Two cases of follicular neoplasm which has many variants like oncocytic, hurthle cell etc were finally diagnosed as medullary carcinoma.This is in cordance with the study done by Jayram G [15]. Another case that was suspicious of neoplasm but on histopathology was confirmed as hashimotos thyoriditis is similar to the study conducted by Gharib [16].

Overall diagnostic yield of our study by FNAC was 92 % that was similar to sensitivity done by Abu – salem with sensitivity of 93% and Alam [17] reported a sensitivity of 100% (Table-7).

Table-7: Sensitivity of FNAC

Serial no:	Study *et al.*,	Sensitivity %
1	Abu- salem *et al.*,	93
2	Alam *et al*.,	100
3	Korah *et al.*,	88
4	Present Study	92

CONCLUSION

Although thyroid diseases are very common, the incidence of clinically apparent thyroid nodules ranges from 4% to 10% of the population and risk of malignancy ranges from 5 to 10%. FNAC is thus considered as the gold standard for evaluation of solitary thyroid nodules as in our case with an accuracy result of 92%. It is minimally invasive, cost effective diagnostic tool for pre operative diagnostic acessment of patients with thyroid nodule that a helps the surgeons plan the treatment strategy for better management of patients. In a way cytopathologists helps the surgeons to classify the lesions as benign and malignant thus avoiding large number of unnecessary and complicated surgeries.

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