FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) OF THYROID LESIONS- OUR EXPERIENCE

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ABSTRACT

BACKGROUND

Lesions of thyroid are the common finding in the general practice. With the availability of thyroid function tests widely, awareness about thyroid diseases increased in general population, fine needle aspiration cytology became the standard for investigating thyroid lesions along with ultrasound examination and serum thyroid function assays. Fine needle aspiration cytology is cost effective and more specific investigation for palpable thyroid lesions when compared to ultrasound examination. Though ultrasound-guided fine needle aspiration is more sensitive, but availability and economic burden makes FNAC a widely used investigation. Our study is retrospective analysis of cytology findings of 148 cases of thyroid lesions who referred to our department between March 2016 to February 2017.

MATERIALS AND METHODS

Fine needle aspiration of palpable thyroid lesion patients referred from various other departments from March 2016 to February 2017. Alcohol fixed slides were stained with haematoxylin eosin stain and also with PAP stain.

RESULTS

Our study finds that solitary nodule of thyroid were most common lesions referred for FNAC in our institute. 22.29% of cases were neoplastic lesions and 77.71% were non-neoplastic lesions. 28.57% (n=24) of solitary nodules was diagnosed as neoplastic lesions with 14.2% (n=12) were diagnosed as papillary carcinoma.

CONCLUSION

Our study emphasised on investigating solitary nodules of thyroid with FNAC leads to identification of malignant and potentially malignant lesions with better predictive value and recommends the FNAC as a mandatory investigating tool to detect early malignancy and potentially malignant lesions.

KEYWORDS

FNAC, Thyroid Lesions, Solitary Nodules, Papillary Carcinoma.

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BACKGROUND

Lesions of thyroid are the common finding in the general practice. With the availability of thyroid function tests widely, awareness about thyroid diseases increased in general population, fine needle aspiration cytology became the standard for investigating thyroid lesions along with ultrasound examination and serum thyroid function assays. Fine needle aspiration cytology is cost effective and more specific investigation for palpable thyroid lesions when compared to ultrasound examination. Though ultrasound-guided fine needle aspiration is more sensitive, but availability and economic burden makes FNAC a widely used investigation.

AIM AND OBJECTIVES- Retrospective analysis of fine needle aspiration cases of thyroid lesions of patients referred to our department between March 2016 to February 2017 and to analyse the data of cases based on clinical presentation and cytology diagnosis.

MATERIALS AND METHODS

Retrospective analysis of all the reports of patients with thyroid lesions who attended our department between March 2016 to February 2017 for Fine Needle Aspiration (FNA) cytology. Our institute adopts FNAC as first line of investigation in palpable lesions and solitary nodules of thyroid.

Inclusion and Exclusion Criteria

All the patients with thyroid lesions were included in the study irrespective of age group and gender. Ultrasound-guided FNA slides were excluded from the study. Ultrasound findings, if available were noted at the time of FNA.

FNA was performed by a pathologist without any radiology guidance. Slides were fixed in isopropyl alcohol and were stained with haematoxylin and eosin. PAP stain was performed for few cases.

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RESULTS

We have performed a total of 148 FNAs between March 2016 to February 2017. Out of 148 patients, 18.24% (n=27) were males and 81.76% (n=121) were females with F:M ratio is 4.48:1. 36.48% (n=54) belong to the age group of 31-40 years with 50 females and 4 males constitute the commonest age group in our study (Table 1).

Age Groups	Male	Female	Total	Percentage
1-10	1	0	1	0.06%
11-20	3	6	9	6.08%
21-30	6	20	26	17.56%
31-40	4	50	54	36.48%
41-50	8	26	34	22.97%
51-60	4	10	14	9.45%
61-70	1	9	10	6.75%
Total	**27 (18.24%)**	**121 (81.76%)**	**148**	

Table 1. Age Group and Gender Distribution of Thyroid Lesions

All the patients were divided into three groups based on the clinical presentation of thyroid lesions as diffuse smooth swelling of thyroid nodular goitre and solitary nodules of thyroid. Out of 148 patients with thyroid lesions, 56.7% (n=84) were referred for solitary nodules, 21.62% (n=32) were referred for nodular goitre and 21.62% (n=32) were referred for diffuse smooth swelling of thyroid.

Bethesda Categories	Cytology Diagnosis	Diffuse Swelling	Nodular Goitre	Solitary Nodules	Percentage
Nondiagnostic	Only colloid	0	0	8	5.4%
Benign	Nodular goitre	5	15	17	25%
	Adenomatoid goitre	6	6	16	18.91%
	Colloid nodule	0	1	18	12.83%
	Hashimoto's thyroiditis	21	1	0	14.86%
	Subacute thyroiditis	0	0	1	0.6%
AUS/FLUS	AUS/FLUS	0	0	0	0%
Follicular neoplasm	Follicular neoplasm	0	0	11	7.43%
	Hurthle cell neoplasm	0	0	1	0.6%
SFM	SFM	0	2	0	1.35%
Malignancy	Papillary carcinoma	0	6	12	12.16%
	Medullary carcinoma	0	1	0	0.6%
Total		**32**	**32**	**84**	

Table 2. Cytology Diagnosis Vs. Clinical Presentation of Thyroid Lesions AUS/FLUS - Atypia of Undetermined Significance/Follicular Lesions of Undetermined Significance; SFM - Suspicious for Malignancy

22.29% (n=33) of cases were neoplastic lesions and 77.71% (n=115) were non-neoplastic lesions. Neoplastic lesions constitute follicular neoplasms, lesions suspicious for malignancy and malignancy cases. Non-neoplastic lesions constitute benign lesions and lesions, which showed only colloid.

Solitary nodule of thyroid constitute 84 cases in our study. Out of 84 cases, 18 cases was diagnosed as colloid nodules, 17 cases was diagnosed as nodular goitres, 16 cases was diagnosed as adenomatoid goitre, 12 cases of papillary carcinoma and 12 cases as follicular neoplasm. 8 cases show only colloid.

Total 19 patients were reported as having malignancy with 18 patients had papillary carcinoma and one patient had medullary carcinoma. 12 out of 18 cases of papillary carcinoma were presented as solitary nodules clinically and 6 cases of papillary carcinoma of thyroid were presented as nodular lesions of thyroid. A case of medullary carcinoma was presented as nodular lesion in a postoperative known case of medullary carcinoma. 12 patients were diagnosed as follicular neoplasm/suspicious for a follicular neoplasm were presented clinically as solitary nodule. Two patients were diagnosed as lesions suspicious for malignancy with features of papillary carcinoma was presented clinically as nodular goitres.

Bethesda Categories	Cytology Diagnosis	Males	Females	Total	Percentage
Nondiagnostic	Only colloid	4	4	8	5.4%
Benign	Nodular goitre	6	31	37	25%
	Adenomatoid goitre	4	24	28	18.91%
	Colloid nodule	0	19	19	12.83%
	Hashimoto's thyroiditis	2	20	22	14.86%
	Subacute thyroiditis	1	0	1	0.6%
AUS/FLUS	AUS/FLUS	0	0	0	0%

Follicular neoplasm	Follicular neoplasm	0	11	11	7.43%
	Hurthle cell neoplasm		1	1	0.6%
SFM	SFM	0	2	2	1.35%
Malignancy	Papillary carcinoma	9	9	18	12.16%
	Medullary carcinoma	1	0	1	0.6%
Total		**27**	**121**	**148**	

Table 3. Cytology Diagnosis Vs. Gender Distribution AUS/FLUS - Atypia of Undetermined Significance/Follicular Lesions of Undetermined Significance; SFM- Suspicious for Malignancy

According to The Bethesda System for Reporting Thyroid Cytopathology,[1] our results (Table 1, 2) show 72.2% (n=107) constitute benign thyroid lesions with majority of the lesions are nodular goitres (25%), followed by adenomatoid goitres, Hashimoto's thyroiditis, colloid nodules, etc. (Table 1). 5.4% (n=8) cases yield only colloid without cellular content. 8.1% (n=12) cases constitute follicular neoplasm with one case showed features of Hurtle cell neoplasm. 1.35% (n=2) cases showed features of follicular nodule with prominent nuclear grooves and absence of nuclear inclusions and was categorised as suspicious for malignancy. 12.16% (n=18) cases showed features of papillary carcinoma constituting papillary configuration with central fibrovascular core, intranuclear cytoplasmic inclusions and nuclear groves. A single case of medullary carcinoma thyroid was diagnosed in our study.

DISCUSSION

Our study showed female patients are more common than males as was seen in studies done by other groups. Most common age group (Table 1) is 4th decade (31-40 years), similar to studies done by M.P. Singh and Anand Saxena,[2] whereas Junu Devi and Niami Aziz[3] study showed 5th decade and Srivastava CS and Saxena A.[4] study showed 6th decade.

Patients of solitary nodules were frequently investigated for the nature of lesion in our study. 56.7% (n=84) of cases were solitary nodules and 14.2% (n=12) solitary nodules were diagnosed as having papillary carcinoma, another 14.2% (n=12 cases) were diagnosed as follicular neoplasm, which are having 15-30% risk of malignancy. Our study shows 12.83% cases were malignant lesions and neoplastic lesions (including follicular neoplasm and suspicious of malignancy) constitute 22.2% (n=33) and non-neoplastic lesions constitute 77.7% (n=115). Most common malignancy is papillary carcinoma of thyroid in our study and also in other Indian studies.

Percentage of neoplastic lesions and malignancy is high in our study when compared to other Indian studies[3,4,5,6,7,8] and slightly lower when compared to study done by M.P. Singh et al.[2] 56.7% of cases in our study were solitary nodules, which might be the cause for high percentage of neoplastic lesions.

CONCLUSION

Our study finds that solitary nodule of thyroid were most common clinical lesion referred for FNAC of thyroid in our institute. 28.57% (n=24) of solitary nodules was diagnosed as neoplastic lesions with 14.2% (n=12) were diagnosed as papillary carcinoma. Our study and other expertise[7,9] 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. Our study emphasised on investigating solitary nodules of thyroid with FNAC leads to identification of malignant and potentially malignant lesions with better predictive value and recommends the FNAC as a mandatory investigating tool to detect early malignancy and potentially malignant lesions in solitary nodules. Statistically relevant data can be created by further studying solitary nodules based on ultrasound findings of size, presence of calcifications, duration of lesion and age of the patients.

Figure 1. Papillary Carcinoma Presented as Solitary Nodule of Thyroid

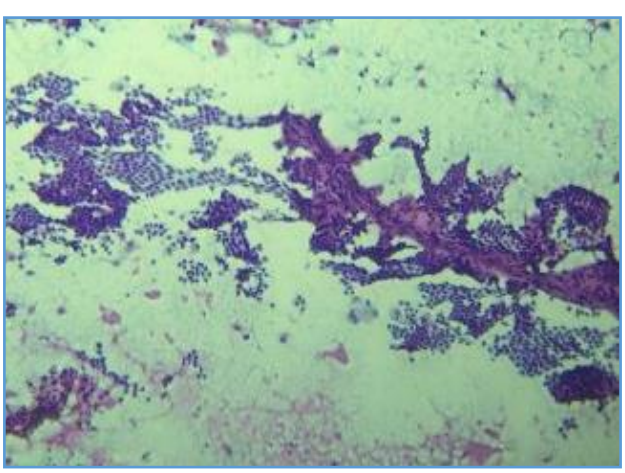

Figure 2. Papillary Fronds with Central Fibrovascular Core (PAP Stain)

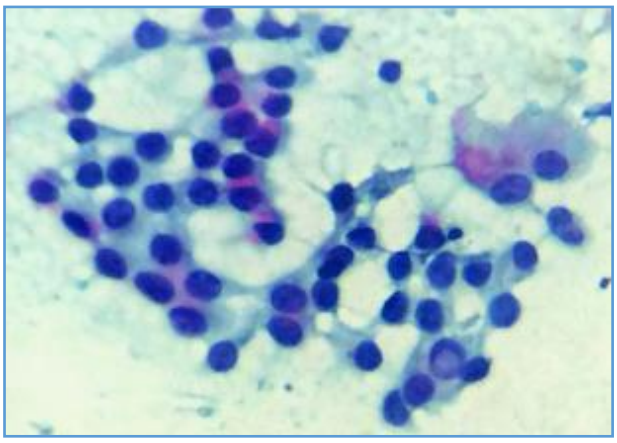

Figure 3. Intranuclear Cytoplasmic Inclusion (PAP Stain)

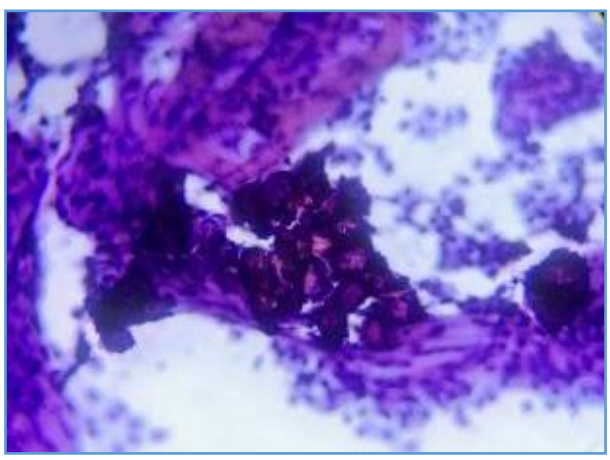

Figure 4. Psammoma Bodies in Papillary Carcinoma (PAP Stain)

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