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Research Article

A CLINICOPATHOLOGICAL STUDY OF THYROID SWELLINGS

***Venkates T.K.[1], Vighnesh V.V.[1], Subramanian C.S.[1], Ashok Swaminathan G.[2] and Vishwanathan[4]**
[1]Department of General Surgery, Rajah Muthiah Medical College, Chidambaram Tamil Nadu
[4]Department of Plastic Surgery, Rajah Muthiah Medical College, Chidambaram Tamil Nadu
**Author for Correspondence*

ABSTRACT
The normal thyroid gland is impalpable. The term goiter (Latin, guttur=the throat) is used to describe generalized enlargement of the thyroid gland. Biosynthetic defects, iodine deficiency, autoimmune disease, nodular disease can each lead to goiter, though by different mechanisms. Graves' disease and hashimoto's thyroiditis are also associated with goiter. In addition, various forms of thyroid cancer are relatively common and amenable to detection by physical examination. The management of goiter depends on the aetiology, the detection of thyroid enlargement and physical examination should prompt further evaluation to identify its cause. More sensitive methods of detection such as ct, thyroid ultrasound and pathological studies reveal thyroid nodules in >20% of glands. Most authorities still rely on physical examination to detect thyroid nodules, reserving ultrasound for monitoring nodule size or as an aid in thyroid biopsy. Otherwise, FNA biopsy should be the first step in the evaluation of a thyroid nodule. The aim of the study is to analyze the clinical presentation of thyroid swellings & to study the role of FNAC in the diagnosis and assess the sensitivity and specificity of FNAC towards thyroid swellings. This is a prospective study of patients admitted with thyroid swellings over a period of 3 years in Rajah Muthiah Medical College Hospital, Annamalai Nagar. Exclusion criteria: patients not undergoing thyroid surgery were excluded from the study. Results **o**f the 87 patients who underwent thyroid surgeries, 82 were female and five were female and five were male, with a striking female preponderance. The average of age of female patients is 36.24 years. The average age of male patients is 43.2 years. The common symptom was swellings, some had pain. Some had mild pressure effects. One secondary toxicosis patient had her symptom under control due medications. No patient presented with neck nodes or secondary metastasis of these 87 patients 24 presented with diffuse goiter, 45 presented with solitary nodular goiter, 18 presented with multinodular goiter. In our study sensitivity of FNAC is 80% & specificity is 98%. The clinical presentations of benign thyroid swellings have varied benign pathological diagnosis. FNAC in our study has high specificity. Hence malignant lesions are diagnosed fairly accurately. However, its sensitivity is relatively low. Interpretation of negative result has to be made with caution to reduce the false negative rate. The procedure has a central role in the management of thyroid nodules and should be used as the initial diagnostic test.

***Keywords*:** *Thyroid Swellings, FNAC, Histopathological Examination*

INTRODUCTION
The normal thyroid gland is impalpable. The term goiter (Latin, guttur=the throat) is used to describe generalized enlargement of the thyroid gland. It is a ductless gland. Biosynthetic defects, iodine deficiency, autoimmune disease, nodular disease can each lead to goiter, though by different mechanisms. Graves' disease and hashimoto's thyroiditis are also associated with goiter. In addition, various forms of thyroid cancer are relatively common and amenable to detection by physical examination. The management of goiter depends on the aetiology, the detection of thyroid enlargement physical examination should prompt further evaluation to identify its cause. More sensitive methods of detection such as ct, thyroid ultrasound and pathological studies reveal thyroid nodules in >20% of glands. Most authorities still rely on physical examination to detect thyroid nodules, reserving ultrasound for monitoring nodule size or as an aid in thyroid biopsy. Otherwise, FNA biopsy should be the first step in the evaluation of a thyroid nodule. FNA has a good sensitivity and specificity. The technique is particularly good for detecting PTC. The distinction of benign and malignant follicular lesion is often not

possible using cytology alone.in this study much emphasis is placed on the clinical presentation of thyroid swellings and the role of pathological investigations in the management of thyroid swellings.
Treatment modalities of thyroid swellings depend on the clinical presentation and pathological evaluation of thyroid swellings.
The main aim of the study is

- To analyze the clinical presentation of thyroid swellings
- To study the role of FNAC in the diagnosis and assess the sensitivity and specicity of FNAC towards thyroid swelling.

MATERIALS AND METHODS

Methods

This is a prospective study of patients admitted with thyroid swellings over a period of 3 years in Rajah Muthiah Medical College Hospital, Annamalai Nagar.
Exclusion criteria: patients not undergoing thyroid surgery were excluded from the study.
Patients were admitted according to their chronological numbers of hospital admission. Prior institutional ethical committee clearance was obtained.
The methods of study consist of detail history taking, clinical examination, routine laboratory investigation, relevant special investigations in some cases.
All patients underwent FNA with or without ultrasonogram guidance after getting informed consent from the patient and cytological diagnosis was made according to "the national cancer institute thyroid fine needle state of science conference – Bethesda conference classification".
All the patients were explained about their diagnosis and a written informed consent was obtained from each patient. Total thyroidectomy and hemi thyroidectomy were performed according to type of thyroid swelling. All the patients were operated under general anaesthesia in the supine and rose's position by the same surgical team. Dissection was carried out with the help of a diathermy knife and scissors. Absolute haemostasis was maintained in the dissection bed in all the patients. All thyroid specimens were sent for histopathological examination.
The sensitivity, specificity, positive predictive value, negative predictive value, yield of cancer of FNAC were assessed by comparing cytological diagnosis with histopathological examination.

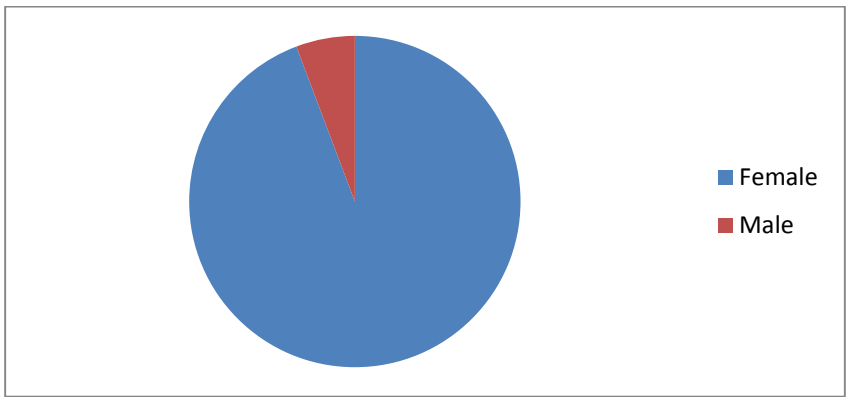
RESULTS AND DISCUSSION

Results

This is a study of eighty seven patients during the period over a period of three years in the Rajah Muthiah Medical College Hospital Annamalai University who underwent thyroid surgeries.

Patients

Of the eighty seven patients who underwent thyroid surgeries, eighty two were female and five were female and five were male, with a striking female preponderance.

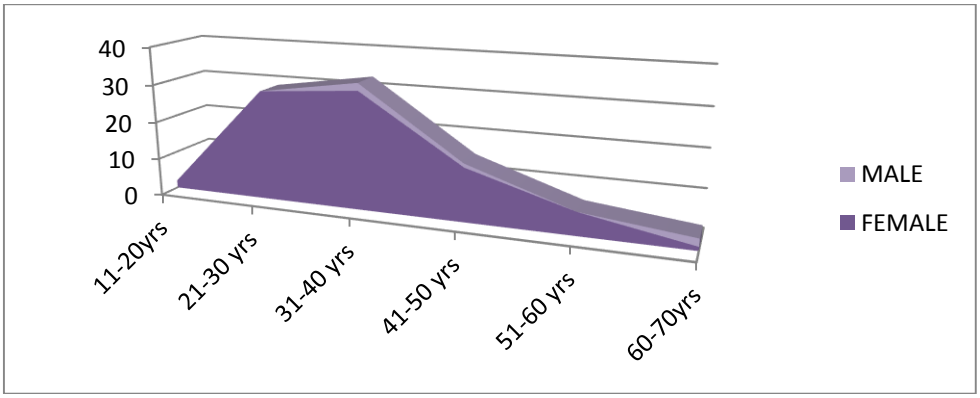


Age

- The average age of the patients is 36.65 years.
- The average of age of female patients is 36.24 years.
- the average age of male patients is 43.2 years.
- The minimum age is 17 years
- The maximum age is 70 years

Age presentation in our study is as follow:

Age in years	Female	Male	Total
11-20	2	0	2
21-30	29	0	29
31-40	31	2	33
41-50	14	1	14
51-60	6	0	6
61-70	1	2	3
Total	82	5	87



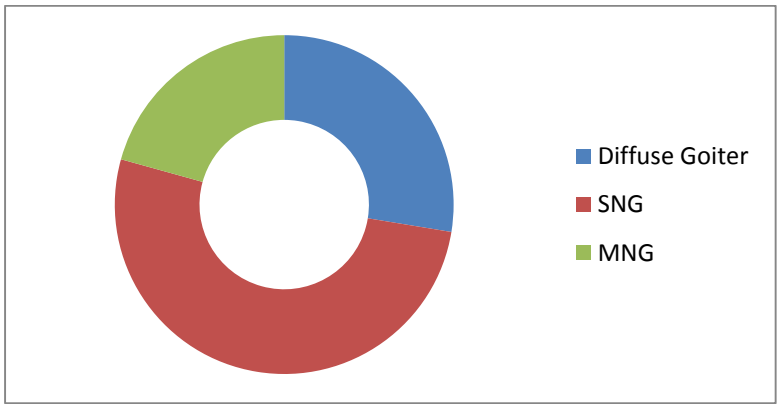
Presentation

The common symptom was swelling. Some had pain. Some had mild pressure effects. One secondary toxicosis patient had her symptom under control due medications.

No patient presented with neck nodes or secondary metastasis.

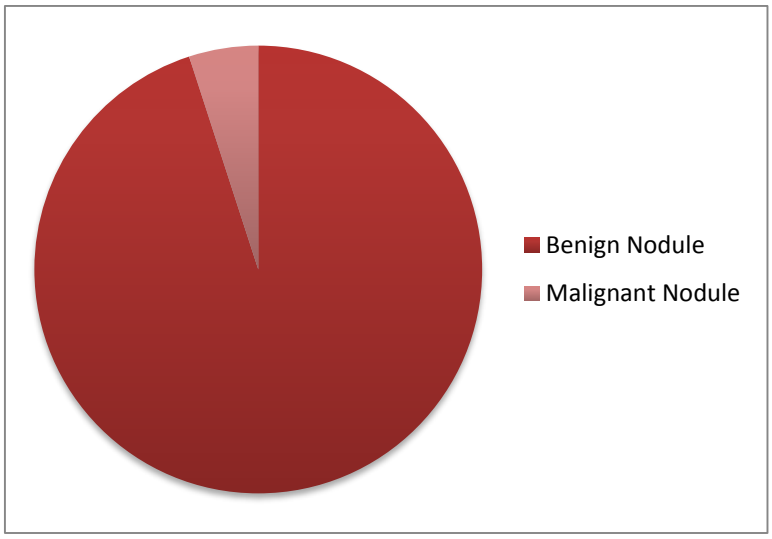
The clinical presentations are as follows:

Type	Diffuse goiter	Sng	Mng
No	24	45	18



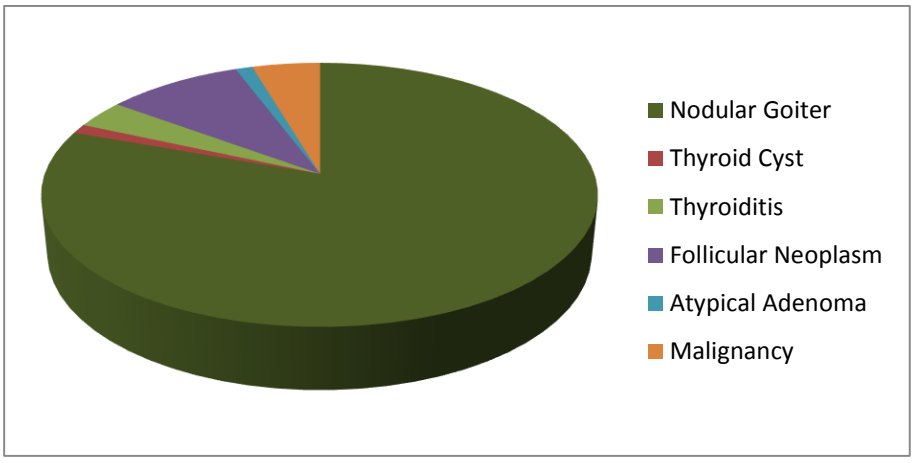
Ultrasonogram

Usg	Benign nodule	Malignant nodule	Total
No	83	4	87
%	95	5	100



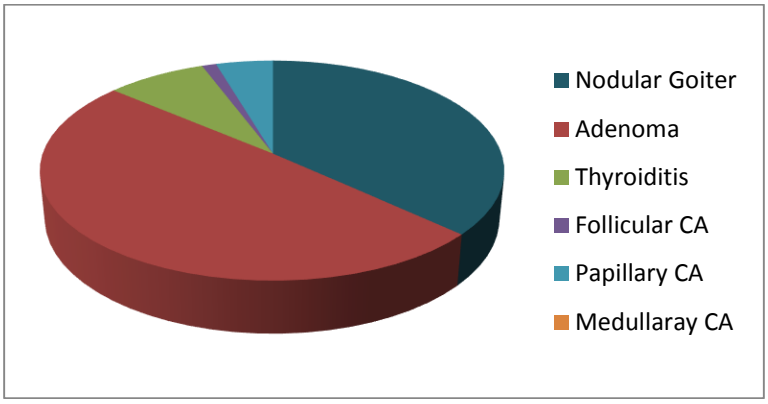
The FNAC Results Are As Follows:

FNAC	Nodular goiter	Thyroid cyst	Thyroiditis	Follicular neoplasm	Atypical adenoma	Malignancy	Total
No	70	1	3	8	1	4	87
%	81	1	3	9	1	5	100



Biopsy

Biopsy	Nodular goitre	Adenoma	Thyroiditis	Follicular ca	Papillary ca	Medullary ca	Total
No	32	43	7	1	4	0	87
%	37	50	8	1	4	0	100



Cytodiagnosis

Cytodiagnosis is based on the "the national cancer institute thyroid fine needle state of science conference – Bethesda conference classification".

It is divided into three main subcategories

- Benign: nodular goitre, hashimotos thyroiditis, subacute thyroiditis, cyst, and colloid nodule
- Suspicious/indeterminate lesion: follicular neoplasm, follicular atypia of undetermined significance (flus), hurthle cell neoplasm, suspicious for malignancy
- Malignancy: papillary carcinoma, follicular carcinoma, medullarycarcinoma, anaplastic carcinoma.

Patients with a "benign" cytodiagnosis do not have malignancy and may have a normal thyroid, a colloid nodule, lymphocytic thyroiditis, subacute thyroiditis, or other benign conditions.

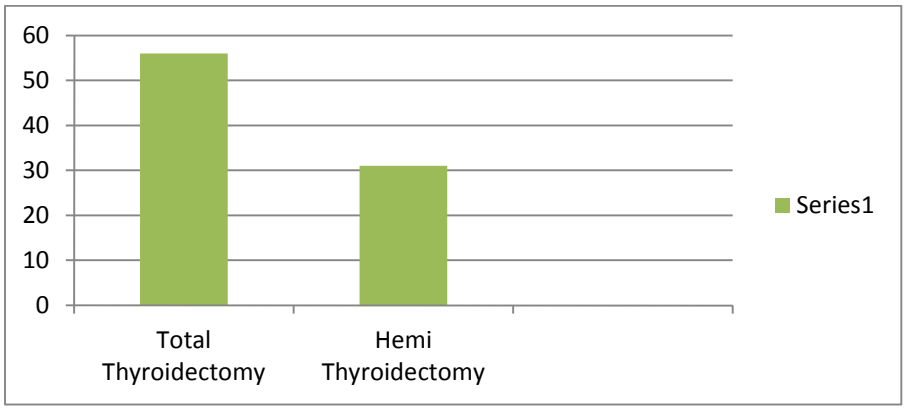
Patients with a suspicious (indeterminate) cytodiagnosis have specimens showing hypercellularity and a pattern suggestive of follicular- or hurthlecell neoplasms or atypical features suggestive of, but not diagnostic for, malignancy.

Patients with a malignant cytodiagnosis have cytologic findings indicating the presence of malignant cells consistent with primary or metastatic thyroid carcinoma.

As per the above criteria, our study shows:

Type	No	Percentage
Benign	74	85
Malignant	4	5
Suspicious	9	10
Total	87	100

The 9 patients in suspicious category includes 7 follicular neoplasm: 1 atypical adenoma; 1 hyperplastic goiter.



Yield of Cancer

Defined as the ratio of the total number of patients with carcinoma to the total number of cases operated.

False negative diagnosis:

Defined as percentage of patients with benign cytologic findings who are confirmed to have malignant lesions of thyroid.

False positive diagnosis:

Defined as percentage of patients with malignant fine needle aspirates who are found to have benign lesions at surgery.

$$\text{Sensitivity} = \frac{\text{true positive}}{\text{True positive + false negative}}$$

$$\text{Specificity} = \frac{\text{true negative}}{\text{True negative + false positive}}$$

Sensitivity & specificity results depend on the suspicious category. If suspicious lesions are positive, then sensitivity increases & specificity decreases and vice versa.

Our study shows:

- One patient with papillary ca on FNAC had follicular lesion as her biopsy report- one false positive
- One patient with atypical adenoma had papillary ca as her biopsy report – one false negative

Our study values are:

Diagnosis	True positive	False positive	False negative	True negative
No	4	1	1	81

Applying these values, the results are:

Sensitivity: 80%
Specificity: 98.78%
False negative%: 20%
False positive%: i 2%
Yield: 5.7%

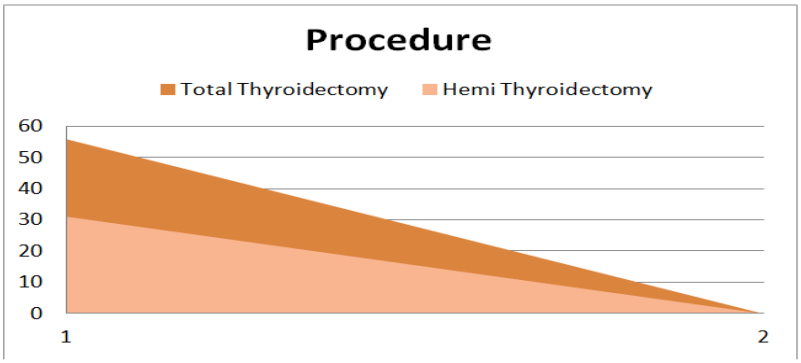
The types of surgeries are as follows:

Hemi thyroidectomy
Total thyroidectomy

Maximum number of patients underwent total thyroidectomy

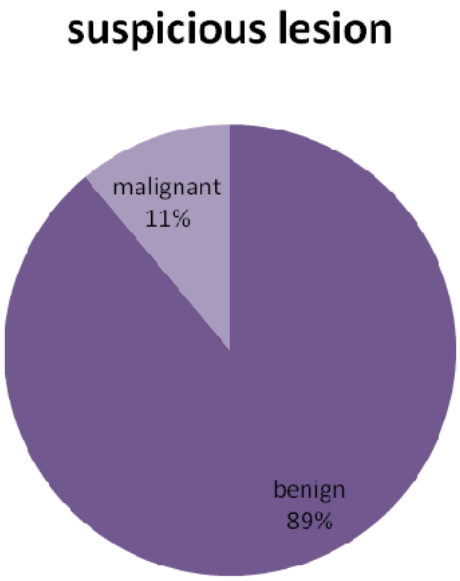
The values of these procedures are as follows:

Type	No
Total thyroidectomy	56
Hemi thyroidectomy	31
Total	87



Percentage of Malignancy in Suspicious Lesions

Type	Number	Percentage
Benign	8	89
Malignant	1	11
Total	9	100



Discussion

Management guidelines for patients with thyroid nodules and differentiated thyroid cancer recommend FNAC as the procedure choice in the evaluation of thyroid nodules.

Sylvia reported that the follicular lesion which belongs to suspicious category needs clinico pathological correlation for management. John *et al.*, (1987) reported a sensitivity rate of 92%. Regina and Hossein (2005) reported that management of patients with nodules "suspicious for follicular neoplasm" is difficult, since only 15% to 20% of such lesions have been shown to be malignant. Study result is 11%.

Cheung *et al.*, (2007) has high specificity and positive predictive values thyroid cancer. He gives comparison of certain series:

Serial	No	Malignant %	Suspicious	Fp %	Fn %	Sensitivity %	Specificity %	Ppv %	Npv %
Gharib *et al.*, 1993	3144	32	10	3	5	83	92	83	92
Cheung *et al.*, 1997	662	25	22	8	10	65	98	92	95
Ogawa *et al.*, 2001	226	67	16	1	13	76	73	85	60
Sclabas *et al.*, 2003	240	43	42	4	4	71	98	96	82
Morgan *et al.*, 2003	253	93	29	26	46	55	74	70	67
Our study	87	5	9	1	20	80	99	80	99

On comparing the clinical presentation with final diagnosis, there are major differences. Although the carcinoma cases have high specificity, the benign lesions show some variability.
18 cases presented with MNG have their final diagnosis as follows: 7 adenoma; 6 colloid goiter; 3 thyroiditis; and only 2 nodular goitre
Other variations noted are 3 goiter cases have their final diagnosis as adenoma. 6 adenoma cases have their final diagnosis as goiter.
3 Thyroiditis cases have their final diagnosis as goiter.

Conclusion

The clinical presentation of benign thyroid swellings has varied benign pathological diagnosis.
The commonest presentation is solitary nodule and the commonest pathological finding is adenoma of the malignant pathological findings, one follicular carcinoma is detected and the predominant carcinoma is papillary carcinoma.
FNAC in our study has high specificity. Hence malignant lesions are diagnosed fairly accurately.
However, its sensitivity is relatively low. Interpretation of negative result has to be made with caution to reduce the false negative rate.
Hence fine-needle aspiration biopsy is safe, accurate, and cost-effective. The procedure has a central role in the management of thyroid nodules and should be used as the initial diagnostic test.

REFERENCES

Sylvia L Asa (No Year). The History and Histology of Follicular Lesions of Thyroid, Department of pathology, University of Toronto. Available: http://www.papsociety.org/guidelines/companion16h2.pdf
John Boey (1987). Investigations for Thyroid-A Critical assessment. *Journal of the Hong Kong Medical Association* **39**(1).
Gharib H (2006(. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the diagnosis and management of thyroid nodules. *Endocrine Practice* **12**(1).
Cheung YS *et al.*, (2007). Fine-needle aspiration cytology of thyroid nodules—how well are we doing? *Hong Kong Medical Journal* **13** 12-5.
Finn Noe Bennedbæk and Laszlo Hegedu S (2000). Management of the solitary thyroid nodule. *The Journal of Clinical Endocrinology & Metabolism* **85(**7) 2493-2498.
Gomez *et al.*, (2009). Inadequate fine needle aspiration biopsy samples: Pathologists versus other specialists. *CytoJournal* **6** 9.
Hossein Gharib and John R Goellner (1993). Fine-Needle Aspiration Biopsy of the Thyroid: An Appraisal. *Annals of Internal Medicine* **118** 282-289.
Irena Tabain *et al.*, (2004). USG guided FNAC in thyroid nodule. *Acta Clinica Croatica* **43** 21-6.
Jeyaram *et al.*, (2007). Fine needle aspiration in Hashimoto's thyroiditis. *Journal of Cytology* **24**(3) 119-24.
Keh-Chuan LOH, Francis S Greenspan, Fang Dong, Theodore R Miller and Peter PB Yeo (1999). Influence of Lymphocytic Thyroiditis on the Prognostic Outcome of Patients with Papillary Thyroid Carcinoma. *Journal of Clinical Endocrinology and Metabolism* **84**(2) 458-63.
Cooper DS (2006). Management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid* **16**(2) 109-42.
Peng Y and Wang HH (2008). A meta-analysis of comparing fine-needle aspiration and frozen section for evaluating thyroid nodules. *Diagnostic Cytopathology* **36** 916-20.
Regina Castro M, and Hossein Gharib (2005). Continuing Controversies in the Management of Thyroid Nodules. *Annals of Internal Medicine* **142** 926-931.
Thomas WEG (1998). Thyroid swelling-a protocol for management. *Journal of the Royal Society of Medicine* **91**(Suppl. 33) 21-27.