

A Hospital Based Observational Assessment of Thyroid Swelling and its Management: Clinicopathological StudyTripti Kumari¹, Abhishek Kumar², Salil Kumar Sharmav³¹Senior Resident, Department of ENT, Government Medical College and Hospital, Bettiah, Bihar, India²Senior Resident, Department of ENT, Government Medical College and Hospital, Bettiah, Bihar, India³Associate Professor and HOD, Department of ENT, Government Medical College and Hospital, Bettiah, Bihar, India

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Conflict of interest: Nil

Abstract**Aim:** The aim of the present study was to assess the relative occurrence of various pathological conditions presenting as thyroid swelling and the clinicopathological examination of swelling.**Material & methods:** A prospective hospital-based study carried out on 1200 cases of thyroid swelling attending the Department of ENT, Bihar, India having adequate diagnostic and treatment facilities during the period of one year**Results:** In this study of 200 subjects, maximum patients were in the age group of 31 to 40 years (32%), followed by 41 to 50 years (25%). The youngest patient in our study was 12 years while oldest was 72 years. Mean age of presentation was 40.82 years. 80 (80%) subjects were females while 20 (20%) subjects were male. All cases presented with swelling in front of neck (100%). Associated complaints were 6 (6%) subjects of bulky thyroid swelling complained of difficulty in swallowing, 6 (3%) subjects complained pain in neck, 2 (1%) subject presented with cervical lymphadenopathy and 2 (1%) subjects with hoarseness of voice. Most of the thyroid swellings were firm in consistency 92 (46%) followed by nodular 40 (20%), cystic consistency in 24 (12%) cases and soft consistency in 20 (10%) cases. Hard swellings accounted for 24 (12%) cases, most of which turned out to be malignant. On USG, Colloid nodule was found in 31 (31%) cases, followed by Multinodular goitre which was 27 (27%) cases, neoplastic etiology found in 23 (23%) cases, solitary thyroid nodule found in 12 (12%) cases and colloid cyst in 07 (7%) cases. FNAC findings were colloid goitre (61%), nodular goitre (19%), follicular neoplasm (10%), papillary carcinoma (9%) and medullary carcinoma (01%).**Conclusion:** FNAC is an easy, rapid, reliable, cost-effective, minimally invasive and readily repeatable technique for diagnosis of thyroid swellings. The common false negative diagnosis is seen in follicular pattern cases, cystic papillary thyroid carcinoma (PTC) and papillary microcarcinoma.**Keywords:** Thyroid swelling, Thyroidectomy, Papillary carcinoma, FNAC, Thyroid HPE.

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Introduction

Thyroid is the largest of all endocrine glands and the only one which is amenable to direct physical examination because of its superficial location. [1] After diabetes mellitus, the thyroid gland is the most common gland to cause endocrine disorder. Disorders of the thyroid gland are the most common endocrine disease particularly in countries where iodine intake through diet is low. Normally thyroid gland is not palpable. [2] Thyroid disease is the most common endocrine disorder. Thyroid swelling is a problem of extensive magnitude all over the world. In India about 170 million people suffer from thyroid disease. [3]

Disorders of thyroid gland present with either an alteration of hormone secretion or as enlargement

(increase size) of the thyroid gland. Thyroid enlargement is the most common sign that are indicated for thyroid disease, it may be diffuse or generalized or localized which again classified as toxic or nontoxic. Lesions of thyroid are predominantly confined to female in the ratio 5:1 to male and this has been attributed to variation of thyroid hormones during female reproductive function and physiological event such as puberty, pregnancy and lactation. Typical problems related to thyroid disorder are fatigue, weight gain, depression, lethargy, dry skin, cold or heat intolerance, change in menstrual cycle, muscle cramps. Thyroid enlargement may be present in both hypothyroidism or hyperthyroidism. [2] Most

common cause of thyroid swelling is deficiency of iodine. [4]

The swelling of thyroid gland is the superficial and easily assessable to direct physical examination. Thyroid is troubled by various developmental, inflammatory and neoplastic disorders. [5] Thyroid swelling can be benign or malignant. Thyroid disease include hyperthyroidism, hypothyroidism, nodular abnormalities like diffuse goitre, multinodular goitre and tumors which include thyroid adenoma, papillary carcinoma, follicular carcinoma, medullary carcinoma etc. [6]

Diagnostic modalities for thyroid swellings include detailed history, clinical examination, blood test, radiological findings, surgical interventions and microscopic examination. Blood test includes Thyroid function test (TFT) serum T3, T4, TSH level and calcitonin level in case of medullary carcinoma of thyroid. [6] The main stay of diagnosis of nodular. Thyroid swelling is by means of clinical, fine needle aspiration cytology, sonological, and histopathological examination. Fine needle aspiration cytology (FNAC) is considered as the important investigation in diagnosis of thyroid swellings. FNAC is the first line investigation for patient with thyroid swelling along with ultrasound, thyroid function test, thyroid scan and level of antibodies are done subsequently with an aim to select who require surgery and those that can be managed conservatively. FNAC plays crucial role in diagnosing neoplastic conditions, inflammatory and infective conditions. The Bethesda system which is widely accepted was framed for reporting thyroid cytopathology. [7] Various other modalities like Elastography, and MR diffusion are also very helpful in the diagnosis of thyroid swelling for further management. [6] This study was intended to study the relative occurrence of various pathological conditions presenting as thyroid swelling and the clinicopathological and radiological examination of swelling.

Material & Methods

A prospective hospital-based study carried out on 1200 cases of thyroid swelling attending the Department of ENT, G.M.C.H, Bettiah, Bihar, India having adequate diagnostic and treatment facilities during the period of one year

Inclusion Criteria: Patients with thyroid swelling, who are fit to undergo thyroid surgery, and willing to give consent to participate in the study.

Exclusion Criteria: Patients with thyroiditis on FNAC, patients with pubertal thyroid enlargement, hypothyroid or hyperthyroid patients, and patients unfit for surgery due to medical reasons.

Methodology

The principle investigator thoroughly examined all cases at the ENT department by taking a detailed history, general examination along with a system based otorhinolaryngological assessment. After clinical assessment, thyroid status was determined by estimation of T3, T4, TSH. FNAC, USG NECK was done. Complete hematological investigations were done. 100 patients of thyroid swelling were evaluated and the main outcome measures were the clinicopathology and sonological correlates. All the subjects were explained about the purpose of the study and were ensured that the information collected from them would be kept confidential and would be used only for academic purpose. Then written informed consent was taken from each subject. Other non-invasive procedure like X-ray chest PA view and soft tissue X-ray neck lateral view was taken to see any calcification or deviation of trachea and retrosternal extension. Preoperative indirect laryngoscopy or 70-degree endoscopy was done in all cases. During operation all operative findings were recorded meticulously and carefully, including macroscopic finding, visualization and isolation of parathyroid glands and recurrent laryngeal nerve, status of draining lymph nodes. All specimens were sent for histopathological study for a confirmed diagnosis. In the postoperative period all the patients were examined for any postoperative complications of immediate and delayed in nature and routinely before discharge, indirect laryngoscopy was done to see the vocal cord movement and their position. The patients were followed up on OPD basis for histopathological report.

Statistical Analysis: Kappa statistics was used to find Significant agreement between FNAC and postop HPE to determine benign and malignant lesions. $k < 0.05$ was considered as statistically significant. Statistical software, STATA version 14.0 was used for data analysis.

Results

Table 1: Age and gender distribution

Age distribution (years)	No. of subjects	%
10-20	6	3
21-30	44	44
31-40	64	32
41-50	50	25
51-60	20	10
61-70	14	7

>71	2	1
Total	200	100
Gender		
Male	40	20
Female	160	80

In this study of 200 subjects, maximum patients were in the age group of 31 to 40 years (32%), followed by 41 to 50 years (25%). The youngest patient in our study was 12 years while oldest was 72 years. Mean age of presentation was 40.82 years. 80 (80%) subjects were females while 20 (20%) subjects were male.

Table 2: Complaints and Thyroid swellings

Complaints	N	%
Swelling of neck	200	100
Associated complaints		
Bulky thyroid swelling complained of difficulty in swallowing	12	6
Pain in neck	6	3
Cervical lymphadenopathy	2	1
Hoarseness of voice	2	1
Thyroid swellings		
Firm consistency	92	46
Nodular	40	20
Cystic consistency	24	12
Soft consistency	20	10
Hard swellings	24	12

All cases presented with swelling in front of neck (100%). Associated complaints were 6 (6%) subjects of bulky thyroid swelling complained of difficulty in swallowing, 6 (3%) subjects complained pain in neck, 2 (1%) subject presented with cervical lymphadenopathy and 2 (1%) subjects

with hoarseness of voice. Most of the thyroid swellings were firm in consistency 92 (46%) followed by nodular 40 (20%), cystic consistency in 24 (12%) cases and soft consistency in 20 (10%) cases. Hard swellings accounted for 24 (12%) cases, most of which turned out to be malignant.

Table 3: Cytodiagnosis and its correlation with histopathological diagnosis of various thyroid lesions

FNAC	No. of cases	Histopathological diagnosis		Statistical remarks
Nonneoplastic lesion				
		Colloid goitre	88	TN
		Nodular goitre	12	TN
Colloid goitre and with cystic changes	122	Thyroiditis	14	TN
		Follicular carcinoma	2	FN
		Papillary carcinoma	6	FN
		Nodular goitre	28	TN
		Thyroiditis	2	TN
Nodular goitre	38	Follicular carcinoma	2	FN
		Papillary carcinoma	6	FN
Total	160			
Neoplastic lesion				
		Follicular carcinoma	10	
Follicular neoplasm	20	Follicular adenoma	8	
		Nodular goitre	2	
		Papillary carcinoma	18	TP
Positive for malignant cells	20	Medullary carcinoma	2	TP
Total	40			

On USG, Colloid nodule was found in 31 (31%) cases, followed by Multinodular goitre which was 27 (27%) cases, neoplastic etiology found in 23 (23%) cases, solitary thyroid nodule found in 12 (12%) cases and colloid cyst in 07 (7%) cases. FNAC findings were colloid goitre (61%), nodular goitre (19%), follicular neoplasm (10%), papillary carcinoma (9%) and medullary carcinoma (01%).

Table 4: Sensitivity, specificity values of FNAC

Sensitivity	56.64%
Specificity	100%
Positive predictive value	100%
Negative predictive value	92%

The sensitivity, specificity, positive predictive value, and negative predictive value of FNAC for diagnosis of thyroid swellings were 56.64%, 100%, 100% and 92%, respectively.

Discussion

The primary concern is the biologic behavior of benignancy versus malignancy in a swelling so that the operative approach can be aptly modified. Thyroid swelling is by means of clinical, fine needle aspiration cytology, sonological, and histopathological examination. [8] Fine needle aspiration cytology (FNAC) is considered as the important investigation in diagnosis of thyroid swellings, however it has some limitations related to some aspects, mainly overlapping cytological features between benign and malignant follicular neoplasm, in detection of some papillary carcinomas because of associated thyroid pathology owing to low yield of cells and loss of histological architecture. [9,10] Invasive fungal sinusitis is subdivided into acute and chronic invasive fungal sinusitis. Some authors further subdivided chronic invasive sinusitis to granulomatous & non-granulomatous invasive sinusitis. [11,12] Many severe complications like nasal deformity, visual loss, cavernous sinus thrombosis, cranial invasion, death, etc. can be found in invasive fungal sinusitis. The incidence of morbidity and mortality of invasive fungal rhinosinusitis ranged from 20 to 80%. [13]

In this study of 200 subjects, maximum patients were in the age group of 31 to 40 years (32%), followed by 41 to 50 years (25%). The youngest patient in our study was 12 years while oldest was 72 years. Mean age of presentation was 40.82 years. 80 (80%) subjects were females while 20 (20%) subjects were male. Rios et al showed that 89% were females, while Godara et al, showed that 90% were females. [14,15] All cases presented with swelling in front of neck (100%). Associated complaints were 6 (6%) subjects of bulky thyroid swelling complained of difficulty in swallowing, 6 (3%) subjects complained pain in neck, 2 (1%) subject presented with cervical lymphadenopathy and 2 (1%) subjects with hoarseness of voice. Most of the thyroid swellings were firm in consistency 92 (46%) followed by nodular 40 (20%), cystic consistency in 24 (12%) cases and soft consistency in 20 (10%) cases. Hard swellings accounted for 24 (12%) cases, most of which turned out to be malignant. In 503 thyroid cases of Rao KM et al 75% firm, 5.3% cystic, 14.4% soft and 5.3% were

hard in consistency. [16] In present study, FNAC showed 80% non-neoplastic and 20% neoplastic lesions which was almost similar to Shafiqul et al study which showed 78% neoplastic lesions. [17]

On USG, Colloid nodule was found in 31 (31%) cases, followed by Multinodular goitre which was 27 (27%) cases, neoplastic etiology found in 23 (23%) cases, solitary thyroid nodule found in 12 (12%) cases and colloid cyst in 07 (7%) cases. FNAC findings were colloid goitre (61%), nodular goitre (19%), follicular neoplasm (10%), papillary carcinoma (9%) and medullary carcinoma (01%). Papillary carcinoma was the most common malignant thyroid lesion in most of the studies. This was in cordance with the present study. Studies have shown that papillary carcinoma can occur at any age and rarely has been diagnosed as a congenital tumour. It is to be stressed that in most of the cases of papillary carcinoma diagnosed by FNAC were papillary carcinoma on histopathological examination also. [8,10]

The sensitivity, specificity, positive predictive value, and negative predictive value of FNAC for diagnosis of thyroid swellings were 56.64%, 100%, 100% and 92%, respectively. According to the study conducted by Thaiyalnayakis et al [18], the sensitivity, specificity, positive predictive value and negative predictive value of TIRAD was 37.5%, 75%, 11.54% and 93.24% respectively. Among 50 patients, the cytological and histopathological diagnosis was found to be different in 7 patients. Out of which benign diagnosis on cytology was converted to malignant in 6 (12%) patients and 1 (2%) patient, malignant cytology was converted to benign on histopathology. In a study done by Gupta et al [19] including 25 patients, benign cytological diagnosis was converted to malignant in 3 (66.7%) patients on final histopathological examination.

Conclusion

Females have greater preponderance for thyroid disease. USG can diagnose multi nodularity and intra thyroid lesion in better way than any other radiological modality. FNAC is simple, safe and cost-effective modality in pre-operative investigation of thyroid swellings with good sensitivity, high specificity and diagnostic accuracy to differentiate between benign and malignant lesion. Malignant cases diagnosed on FNAC underwent total thyroidectomy at primary surgery, thereby obviating the need of revision surgery. Misdiagnosis was more with follicular neoplasms

compared to other lesions. The scope and limitations of FNAC should be fully realized, especially in the interpretation of follicular neoplasms.

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