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AN OBSERVATIONAL STUDY OF HISTOPATHOLOGICAL PATTERNS OF THYROID LESIONS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction: Thyroid gland is afflicted by various pathologies ranging from diffuse enlargement (goitre) to nodular lesions, thyroiditis, and malignancies. The incidence of thyroid diseases is increasing in recent years due to goitrogens and changing food habits The objective of this study is to identify the histopathological pattern of thyroid and the frequency of non- neoplastic and neoplastic thyroid lesions with respect to variables like frequency, age, sex distribution and histopathological patterns

Material and method: An Observational study was conducted in Department of Pathology at a tertiary care hospital during a period of 3 years. The specimens included lobectomy, hemi thyroidectomy, subtotal thyroidectomy, near total thyroidectomy and total thyroidectomy. Sample size of the study was 80 cases
Detailed information regarding age, gender, clinical status, relevant investigation like fine needle aspiration cytology (FNAC), thyroid scan, ultrasound reports and operational findings were obtained from histopathology request forms.

Results: There were 71 female (88.75%) and 9 male (11.25%).Male to female ratio was 7.8 to 1 .The age of the patients ranged from 6 to 80 years. The cases were further divided non-neoplastic (48%) and neoplastic(32%).Further neoplastic lesions were divided into benign, borderline and malignant lesions. Most common non-neoplastic lesion was colloid goiter and neoplastic lesion found was papillary carcinoma.

Conclusion: Histopathological evaluation of thyroid lesion is challenging as well as mandatory as diagnosis may vary from non-neoplastic lesions to neoplastic lesions. Thyroid lesion are most commonly seen the women so screening of the women with neck swelling can help in early detection. Periodic evaluation of middle aged and elderly females with colloid goitre for early detection of carcinomatous change.

Key words: Colloid goitre, papillary carcinoma, Thyroid, neoplastic, non-neoplastic

INTRODUCTION

The thyroid gland is the largest of all endocrine organs which plays wide and vital physiological roles in the body(1) and thyroid gland is afflicted by various pathologies ranging from diffuse enlargement (goitre) to nodular lesions, thyroiditis, and malignancies. The incidence of thyroid diseases is increasing in recent years due to goitrogens and changing food habits(2).

The prevalence of thyroid swelling ranges from 4% to 10% in the general adult population and from 0.2% to 1.2% in children (3) In surgical practice, thyroid lesions are common, observed in 4-7% of the population and affect women more commonly than men. Excising all the thyroid lesions is impracticable and associated with risk (4)

The prevalence and pattern of these thyroid diseases in a given community is variable depending on various factors including age, sex, dietary, environmental factors and geographical patterns[5].It is most prevalent in mountainous areas but also occurs in non-mountainous areas remote from sea[6]

A solitary thyroid lesion is defined as a palpable single, clinically detected nodule in the thyroid. They cause more concern because of high probability of malignancy in them, which can range from 5-35% of all solitary thyroid nodules [7] Diffuse thyroid lesions are those that are associated with conditions affecting entire gland such as hyperplasia and thyroiditis. Nodular lesion comprises those disorders that produce a clinical nodule and consists of non-neoplastic hyperplasia as well as benign and malignant tumors [8]

Thyroid carcinoma closely resembles its benign counterpart in physical characteristics, measurable physiological parameters such as serum T3/T4 levels and ultrasonic characteristics. Therefore, the surgical excision of the nodule and its histological examination is the only way to differentiate between the more frequent benign and much less frequent malignant nodules [5].Histological classification of the thyroid lesions especially neoplastic conditions is essential for further therapy and prognosis[9].
The objective of this study is to identify the histopathological pattern of thyroid and the frequency of non- neoplastic and neoplastic thyroid lesions with respect to variables like frequency, age, sex distribution and histopathological patterns

MATERIAL AND METHODS
An Observational study was conducted in Department of Pathology at a tertiary care hospital during a period of 3 years. The specimens included lobectomy, hemi thyroidectomy, subtotal thyroidectomy, near total thyroidectomy and total thyroidectomy. Sample size of the study was 80 cases
Detailed information regarding age, gender, clinical status, relevant investigation like fine needle aspiration cytology (FNAC), thyroid scan, ultrasound reports and operational findings were obtained from histopathology request forms. Gross features of the specimen were noted
The specimens were fixed in formalin, paraffin embedded and 4 microns sections were stained with H and E following the standard protocol.
Histopathological slides were reviewed and were classified into neoplastic and non-neoplastic lesions.

OBSEVATIONS AND RESULTS
There were 71 female (88.75%) and 9 male (11.25%).Male to female ratio was 7.8 to 1 .The age of the patients ranged from 6 to 80 years. The cases were further divided non-neoplastic(48%) and neoplastic(32%).Further neoplastic lesions were divided into benign, borderline and malignant lesions.

AGE WISE	**NEOPLASTIC**	**(%)**	**NON-NEOPLASTIC**	**(%)**	**Total**	**(%)**
1 TO 10	0	0	1	1.25	1	1.25
11 TO 20	2	2.5	7	8.75	9	11.25
21 TO 30	6	7.5	21	26.25	27	33.75
31 TO 40	11	13.75	12	15	23	28.75
41 TO 50	5	6.25	4	5	9	11.25
51 TO 60	2	2.5	3	3.75	5	6.25
61 TO 70	3	3.75	0	0	3	3.75
71 TO 80	3	3.75	0	0	3	3.75
TOTAL	32	40	48	60	80	100

Most of the thyroid lesions were found in the age group 21 to 30 followed by 31 to 40. In 6th decade and 7th decade all the cases were found to be neoplastic.

DIGNOSIS	**HISTOPATHOLOGICAL DIAGNOSIS**	**MALE**	**FEMALE**	**FREQUENCY**	**(%)**
	Cystic colloid goitre	0	1	1	1.25
	Adenomatoid nodule	0	3	3	3.75
	Colloid goitre	0	11	11	13.75
	Diffuse oncocytic hyperplasia with lymphocytic thyroiditis	0	1	1	1.25
	Hashimoto's thyroiditis	0	4	4	5
NON-	MNG with Autoimmune thyroiditis	1	0	1	1

NEOPLASTIC					
	Multinodular goitre	1	9	10	12.25
	Nodular goitre	0	7	7	8.75
	Nodular goitre with cystic degeneration	0	1	1	1.25
	Nodular goitre with thyroiditis	0	1	1	1.25
	Nodular Hashimoto thyroiditis	0	1	1	1.25
	Thyroglossal cyst	4	3	7	7.75

Analysis of non-neoplastic lesion showed a predominance of Colloid goitre(13.75%) followed by Multinodular goitre (12.25%)Seven cases of thyroglossal cyst and One case of diffuse oncocytic hyperplasia with lymphocytic thyroiditis was noted .One case of multinodular goitre with autoimmune thyroiditis was also found.

Most common benign lesion was found to be follicular adenoma followed by hurtle cell adenoma and trabecular adenoma. Among the Borderline cases most common was found to be Non Invasive follicular thyroid neoplasm with Papillary like nuclear features(NIFTP) followed by follicular neoplasm with uncertain malignant potential and cystic nodular goitre with NIFTP.

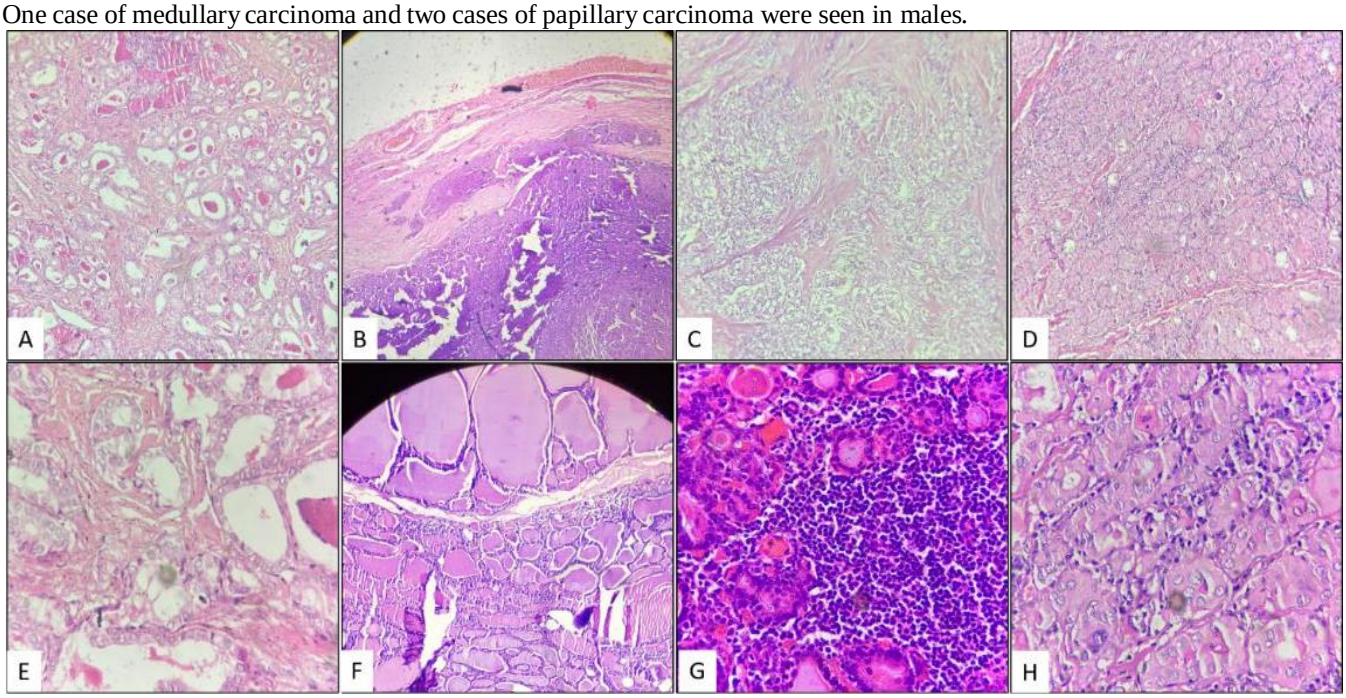
Most common malignant lesion was Papillary carcinoma. Single case of micropapillary carcinoma and Papillary carcinoma was also noted in background of colloid goitre. Other malignant lesion like Medullary carcinoma, follicular carcinoma, Anaplastic carcinoma, thyroid lymphoma and hurtle cell carcinoma were also noted.

One case of Variants of Papillary carcinoma like encapsulated follicular variant of Papillary carcinoma, solid variant, tall cell variant were seen

DIGNOSIS		HISTOPATHOLOGICAL DIAGNOSIS	MALE	FEMALE	FREQUENCY	%
	BENIGN	Follicular adenoma	0	4	4	5
		Hurtle cell adenoma	0	1	1	1.25
		Trabecular adenoma	0	1	1	1.25
	BORDERLINE	cystic nodular goitre with NIFTP	0	1	1	1.25
		follicular neoplasm with uncetain malignant potential	0	1	1	1.25
		NIFTP	0	2	2	2.5
		Anaplastic carcinoma	0	1	1	1.25
	MALIGNANT	Encapsulated FVPTC	0	2	2	2.5
		Follicular carcinoma	0	1	1	1.25
NEOPLASTIC		FVPTC*	0	3	3	3.75
		Hurtle cell carcinoma	0	1	1	1.25
		Medullary carcinoma	1	0	1	1
		Micropapillary carcinoma in colloid goitre	0	1	1	1.25
		Papillary carcinoma	2	6	8	9.5
		Papillary carcinoma -in background of colloid goitre	0	1	1	1.25
		Papillary carcinoma solid variant	0	1	1	1.25
		Tall cell variant -Papillary carcinoma	0	1	1	1.25
		Thyroid -follicular lymphoma	0	1	1	1.25

FVPTC*: Follicular variant of papillary thyroid carcinoma
NIFTP*:Non Invasive follicular neoplasm with papillary like nuclear features

One case of medullary carcinoma and two cases of papillary carcinoma were seen in males.



A)Papillary carcinoma of thyroid (10x) B)Follicular carcinoma showing capsular invasion (10x) C)Medullary carcinoma(10x)D)Hurtle cell carcinoma(10x) E) Papillary carcinoma (40x) F)Colloid Goitre (10x) G) Lymphocytic thyroiditis(40x) H) Hurtle cell carcinoma (40x)

TYPE OF TUMORS	MALE	FEMALE	AGE WISE DISTRIBUTION							
			<10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80
Thyroglossal cyst	4	3	1	4	2	0	0	0	0	0
Colloid goitre	0	11	0	1	8	1	1	0	0	0
Nodular goitre with thyroiditis	0	1	0	1	0	0	0	0	0	0
Adenomatoid nodule	0	3	0	0	3	0	0	0	0	0
Multinodular goitre	1	8	0	0	5	4	0	0	0	0
Nodular goitre	0	7	0	0	2	5	0	0	0	0
Nodular Hashimoto thyroiditis	0	1	0	0	1	0	0	0	0	0
Hashimoto's thyroiditis	0	5	0	0	1	1	3	0	0	0
Nodular goitre with cystic degeneration	0	2	0	0	1	1	0	0	0	0
Cystic colloid goitre	0	1	0	0	0	0	0	1	0	0
Diffuse oncocytic hyperplasia with lymphocytic thyroiditis	0	1	0	0	0	0	0	1	0	0
MNG with autoimmune thyroiditis	1	0	0	0	0	0	0	1	0	0
Follicular adenoma	0	4	0	0	0	3	0	0	0	1
Hurtle cell adenoma	0	1	0	0	1	0	0	0	0	0
Trabecular adenoma	0	1	0	1	0	0	0	0	0	0
Cystic nodular goitre with NIFTP	0	1	0	0	0	1	0	0	0	0
Follicular neoplasm with uncertain malignant potential	0	1	0	0	0	0	1	0	0	0
NIFTP*	0	2	0	0	0	2		0	0	0
Anaplastic carcinoma	0	1	0	0	0	0	0	0	0	1
Encapsulated FVPTC	0	2	0	0	1	0	1	0	0	0
Follicular carcinoma	0	0	0	0	0	0	0	0	0	0
FVPTC	0	3	0	0	1	2	0	0	0	0
Hurtle cell carcinoma	0	1	0	0	0	1	0	0	0	0
Medullary carcinoma	1	0	0	0	0	0	1	0	0	0

Micropapillary carcinoma in background of colloid goitre	0	1	0	0	0	1	0	0	0	0
Papillary carcinoma	2	6	0	0	2	1	1	1	2	1
Papillary carcinoma -in background of colloid goitre	0	1	0	0	0	0	1	0	0	0
Papillary carcinoma solid variant	0	1	0	1	0	0	0	0	0	0
Tall cell variant -Papillary carcinoma	0	1	0	0	0	0	1	0	0	0
Thyroid -follicular lymphoma	0	1	0	0	0	0	0	0	1	0

FVPTC*: Follicular variant of papillary thyroid carcinoma
NIFTP*:Non invasive follicular neoplasm with papillary like nuclear features

DISCUSSION

This study was conducted in the department of Pathology at tertiary care center. For this study, 80 thyroid specimens were studied by detailed history and histopathological examinations.

Both the neoplastic and non-neoplastic diseases of thyroid are common all over the world, with a varying frequency and incidences depending upon iodine deficiency status[10]

Diseases of the thyroid are of great importance as most can be controlled by medical or surgical management[11]
Thyroidectomy, presently, has become a routine procedure as a result of safe anesthesia, antiseptics, fine surgical instruments, developments of new techniques and is offering the chances of cure to many patients[12]

From the study it has been concluded that thyroid lesion has been found more common in females .There were 88.75 % female and 11.25 % male in our study similar to studies of Beigh et al, Ashwini et al , Salama et al, Gupta A et al, Fahim et al and Mandal S, et al[13-18].Female predominance is more in thyroid disorders due to presence of estrogen receptor in the thyroid tissue [19]

In our study patient non neoplastic lesion were 48 % while there were 83.75% non –neoplastic lesion in study of Huzefa ali turkey[20] ,86.5% in sadia alam [21],Among the non –neoplastic lesion colloid goitre and multinodular goitre forms the most common lesion similar to the studies seen in the Dilasma Ghartimagar, Modi and Raheem et al[22-24].

There were also cases of Hashimoto's thyroiditis, multinodular goitre with lymphocytic thyroiditis and nodular lymphocytic thyroiditis showing wide spread lymphocytic infiltration areas of fibrosis along with oxyphilic change.

One case of Diffuse oncocytic hyperplasia with lymphocytic thyroiditis which was reported as category IV(Acc to the Bethesda system for reporting thyroid cytopathology) on FNAC suggesting only oncocytic portion of the lesion was aspirated.

Most of the neoplastic lesions were presented as solitary nodule while non-neoplastic lesion present as diffuse lesion associated clinically with hyperthyroidism, hypothyroidism or euthyroid.

Most common benign lesion found was follicular adenoma followed by hurtle cell adenoma and trabecular adenoma similar to the study of Sheela Km et al[25].

Borderline cases of follicular neoplasm –UMP and NIFTP were also noted. Follicular tumor-UMP showed questionable capsular invasion. NIFTP showed nuclear alteration of papillary carcinoma.

Papillary carcinoma was the most common malignancy noted similar to the studies Sadia alam et al, Gupta A et al[26] , Abdulkader et al[27] Chukudebelu et al[28]. and seen in young adults as well as old age people.

One case of Solid variant of papillary carcinoma was noted in young female. Its occurrence is seen when proliferation predominates the secretion likewise tall cell variant, encapsulated variant and follicular variant of papillary carcinoma was also noted. Medullary carcinoma was noted in one elderly male patient which arise from C (parafollicular) cells.

Micropapillary carcinoma and papillary carcinoma arising in background of colloid goitre was noted

Anaplastic carcinoma, thyroid lymphoma and one case of papillary carcinoma was noted in elderly aged group.

Follicular carcinoma and Hurtle cell carcinoma were noted showing capsular invasion and capsular Invasion.

CONCLUSION

Histopathological evaluation of thyroid lesion is challenging as well as mandatory as diagnosis may vary from non-neoplastic lesions to neoplastic lesions. Main Indication of the surgery is solitary thyroid nodule as most of the malignant lesion present in the form of solitary nodule. Most of the non-neoplastic lesion was colloid goitre while papillary carcinoma was the most common neoplastic lesion. Slightly increase in trend of papillary carcinoma is seen.

Thyroid lesion are most commonly seen the women so screening of the women with neck swelling can help in early detection of malignancy. Periodic evaluation of middle aged and elderly females with colloid goitre for early detection of

carcinomatous change. Elderly male with solitary thyroid lesion have more probability of malignant lesion so physicians must be more cautious while evaluating such lesion.

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