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Study of Thyroidectomy Specimens in a Tertiary Care Hospital

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ABSTRACT

The present study was a two year cross sectional study of histopathology of total 59 thyroidectomy specimens, and their correlation with clinical details, radiological findings and thyroid function tests. Hemithyroidectomy was the most commonly performed surgery i.e. in 32/59 cases (54.24%). Among 32 hemithyroidectomy specimens, 22 (68.75%) were right sided. In this study, Nodular Colloid Goiter was the most common histopathological diagnosis (28/59, 47.46%). Ultrasonography (USG) examination was performed in 55 (93.22%) cases out of total 59 cases. Out of these 55 cases, maximum number of cases 26 (47.27%) were reported as colloid goiter /MNG on USG. Malignant neoplasm was reported in 11 (20.0%) cases. Out of 55 cases, USG findings and histopathological diagnosis showed correlation in 49 (89.09%) cases.

Keywords: Thyroidectomy, Hemithyroidectomy, Nodular goiter, Histological classification, Lymphocytic thyroiditis, Follicular adenoma

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INTRODUCTION

The thyroid gland consists of two butterfly shaped lateral endocrinal lobes, which are connected by relatively thin isthmus, in its anterior aspect of the root. The thyroid makes several hormones, for example thyroxine (T4), thyroid (T3), and calcitonin. A category of specific endocrinological diseases is identified in thyroid disorders (Fujii et al. 2014; Kakudo et al. 2018). Based on various variables the frequency and prevalence of such thyroid disorders in the defined population vary. Not only in mountain regions, but also in non-mountainous regions distant from the sea, this is most common (Lam, 2017).

From a clinical viewpoint, a potential malignant neoplasm is therefore a major concern in the adult with the thyroid nodule (Arul & Masilamani 2015). Various clinical criteria give evidence for thyroid nodule nature, such as single nodules, seem to be more prone to be neoplastic than multiple nodules, nodules are much more inclined to be neoplastic in younger and also in male patients (Mustafa et al. 2014).

Carcinoma of thyroid has strong similarities as regards physical attributes of benign tumours, measurable physiological constraints such as serum levels T3 / T4 and ultrasonics (Agrawal et al., 2015; Barile et al., 2018).

Person rehabilitation has improved the significance of histopathological results. Histopathological analysis plays a significant role in the true and accurate detection of different thyroid abnormalities which have a profound influence on the patient's future management (Coelho et al., 2018). For proper diagnosis as well as treatments, histopathological classifier is crucial for Thyroid tumors.

RESEARCH OBJECTIVES

a) To study histopathology of thyroidectomy specimens and correlate it with clinical profile.

b) To study various lesions encountered in thyroidectomy specimens on histopathology.

c) To correlate histopathological lesions with various biochemical parameters viz. Thyroid function tests.

d) To correlate histopathological findings with clinical details and radiological studies viz. Ultrasonography.

LITERATURE REVIEW

According to Lam (2017) if any of the following risk factors like young male, prior history of head and neck radiation, family history of multiple endocrine neoplasia syndrome type IIA or IIB, fixed nodule, rapidly enlarging mass, vocal cord paralysis (although large benign goiters may also be associated with such paralysis) and cervical lymphadenopathy (although this may be present in some cases of Hashimoto's thyroiditis), are present, the pathologist must be vigilant as there are increased chances of the nodule being malignant.

MATERIALS AND METHOD

Data

The present study is a two year cross sectional study, carried out in the Department of Pathology in our institute. This includes all thyroidectomy specimens received in histopathology section of the Department of Pathology for two years.

Inclusion criteria

All thyroidectomy specimens received in the histopathology section from June 2016 to May 2018 were included. Exclusion criteria: There is no exclusion criterion in this study.

A detailed clinical history of symptoms and signs such as neck swelling, lymphadenopathy, dysphagia, dyspnea, hoarseness of voice and other complaints were taken and noted. Review of the reports of ultrasonography, thyroid function test and fine needle aspiration was done.

Grossing Technique of thyroid

The specimens were received in containers containing 10% formalin solutions following scrutiny of the patient details and identity, in the department.

The specimen was cut into parallel longitudinal slices of around 5 mm thickness each, examined for gross characteristics and kept for fixation in 10% formalin for 10 12 hours.

For papillary carcinoma, entire thyroid gland and line of resection (surgical margin) was taken. For grossly invasive carcinoma other than papillary carcinoma, sections of tumor, normal gland and line of resection was taken.

In case of encapsulated lesions, adequate representation from tumour capsule – thyroid interface was given.

CAP (College of American Pathologist) protocols were followed for reporting the thyroid carcinoma specimens. Mandatory features to report under CAP protocol are:

- Procedure
- Tumour focality
- Tumour size and site,
- Histologic type,
- Margins, Lymphatic invasion, Angioinvasion, Extra thyroidal extensions;
- Count of lymph nodes involved and examined,
- Size of largest of the metastatic deposits, Extranodal invasion;
- pTNM

Figure 1 shows photographs of External surface and cut section of gross specimen of follicular adenoma. Figure 2 represents grossing technique followed for thyroidectomy specimens

Figure 1: Photographs of External surface and cut section of gross specimen of follicular adenoma. Cut section showing well-circumscribed homogenous nodule and partly normal Thyroid gland.

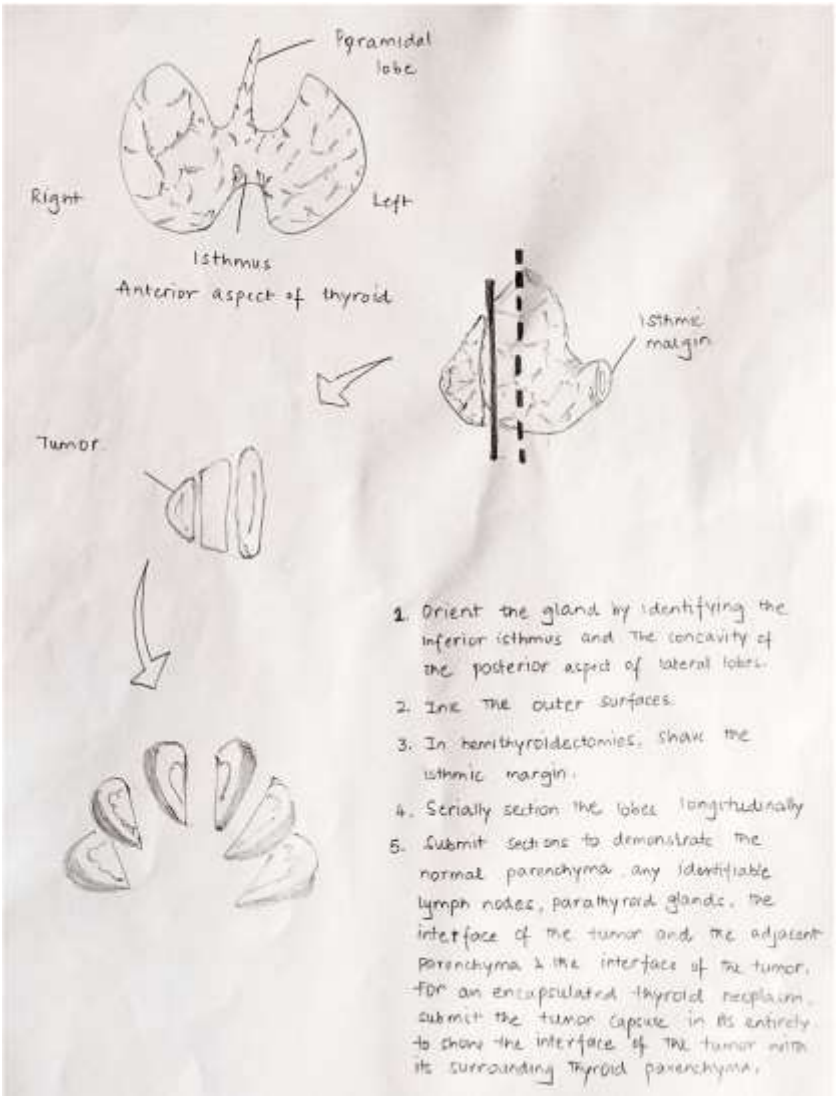

Figure 2: Grossing technique followed for thyroidectomy specimens

RESULTS

During the study period of two years, total of 59 thyroidectomy specimens were received in the histopathology section of Department of Pathology in tertiary care hospital. Figure 3 shows types of lesions found.

Of these, Hemithyroidectomy specimens were maximum and accounted for 32 out of 59 cases (54.24%). Out of 32 hemithyroidectomies, 22 (68.75%) were right sided and 10 (31.25%) were left sided. The remaining specimens were of total thyroidectomy, subtotal thyroidectomy and lobectomy noted in 12 cases (20.34%), 09 cases (15.25%) and 6 cases (10.17%) respectively (see Table 1 and Table 2).

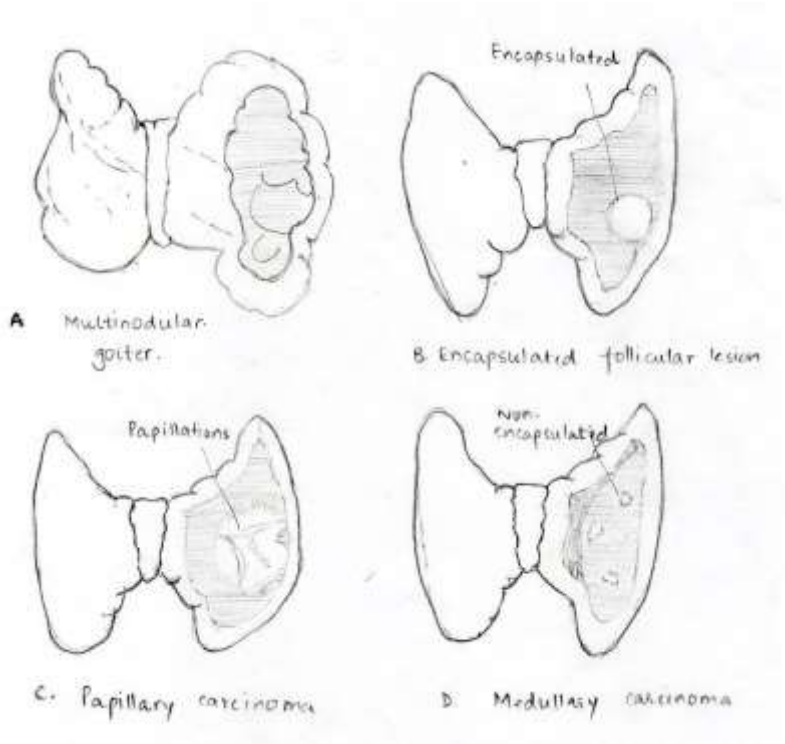

Figure 3: Various lesions found

Table 1: Thyroidectomy specimens distributed according to type of surgery

Type of surgery	Right sided	Left sided	Total (%)
Lobectomy	04	02	06 (10.17%)
Hemithyroidectomy	22	10	32 (54.24%)
Subtotal thyroidectomy	-	-	09 (15.25%)
Total thyroidectomy	-	-	12 (20.34%)
Total	-	-	59 (100%)

Table 2: Clinical features in thyroidectomy cases

Clinical features	Number of cases	%age
Neck swelling	59	100 %
Cervical lymphadenopathy	04	6.78%
Dyspnea	03	5.08%
Dysphagia	02	3.39%
Hoarseness of voice	01	1.69 %
Swelling over parietal region of skull	01	1.69%
Fatigue, weight gain, cold sensitivity	03	5.08%
Weight loss, heat intolerance	01	1.69%

The commonest symptom was neck swelling seen in all (59/59,100%) cases studied followed by cervical lymphadenopathy in 4 out of 59 cases i.e. 6.78%. Out of 4 cases of cervical lymphadenopathy, metastasis of papillary carcinoma was seen in 3/4 (75%) and one was a case of non-Hodgkin lymphoma (Table 2).

Complaint of hoarseness of voice was present in only 1 case which was of follicular carcinoma of thyroid and swelling in the parietal region of skull was presentation of metastasis in skull of an occult follicular carcinoma of thyroid.

Table 3: Clinical Diagnosis at the presentation of patients with palpable thyroid lesions

Clinical diagnosis	Number of cases	Percentage(%)

Solitary thyroid nodule	26	44.07
Nodular colloid goiter	22	37.30
Colloid Goiter with cystic change	1	1.69
Thyroiditis	3	5.08
Thyroid Malignancy	7	11.86
Total	59	100

Solitary thyroid nodule was the most common clinical diagnosis in 26/59 (44.07%) cases followed by nodular colloid goiter in 22/59 (37.30%) cases. Clinically, Thyroid Malignancy was suspected in 07/59 (11.86%) cases in the present study (Table 3 and Table 4).

Table 4: Spectrum of histopathological diagnosis given in all the thyroidectomy samples studied

Histopathology diagnosis	Number of cases	Percentage (%)
Nodular Colloid Goiter	28	47.46
Lymphocytic Thyroiditis	01	1.69
Hashimoto's Thyroiditis	04	6.78
Follicular Adenoma	13	22.05
Hurthle Cell Adenoma	01	1.69
Papillary Carcinoma	05	8.47
Follicular Carcinoma	04	6.78
Medullary Carcinoma	01	1.69
Non-Hodgkin's Lymphoma	02	3.39
Total	59	100

Nodular Colloid Goiter was the most common (28/59, 47.46%) histopathological diagnosis followed by Follicular Adenoma (13/59,22.05%). There were 12 /59 (20.34%) patients of malignant neoplasms of thyroid.

Cases that showed Non-neoplastic lesions constituted 33/59 cases (55.93%) and Neoplastic lesions constituted 26/59 (44.10%) cases (see Figure 4). Benign neoplasms accounted for 14/59 cases (23.73%) of all cases studied. Malignant lesions accounted for 12/59 cases (20.34%).

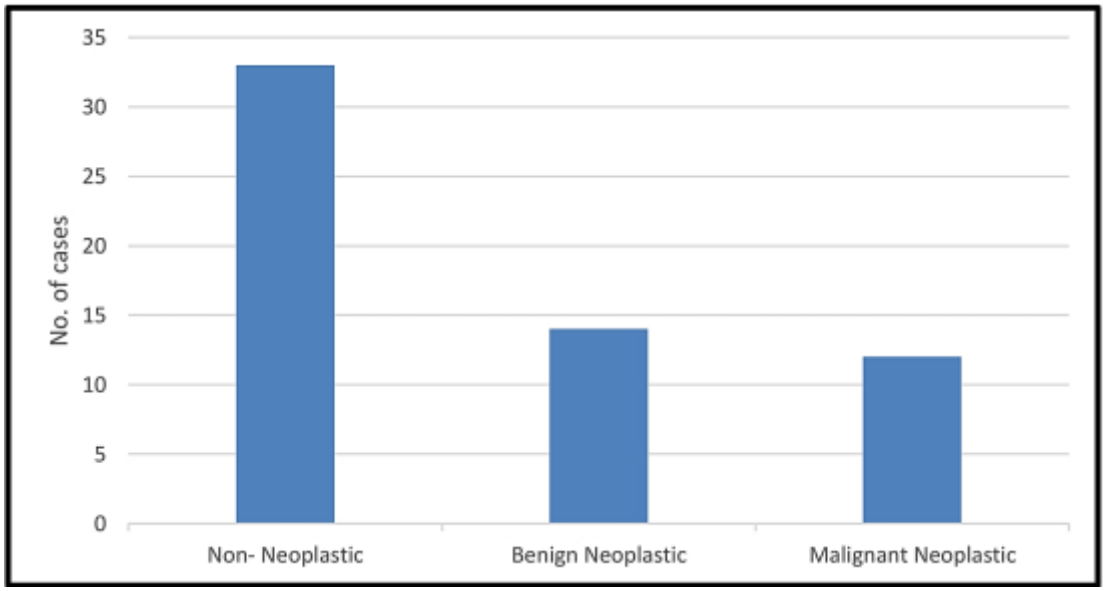

Figure 4: Distribution of Non-neoplastic and neoplastic thyroid lesions

There were 14 cases of benign neoplasms out of 59 thyroidectomies. Predominantly seen was Follicular Adenoma 13/14 (92.86%) cases with female preponderance 12/13 (92.31%) cases. Maximum were from 31-40 years of age group.

Table 5: Gender and age distribution of total cases

Age(years)	11-20		21-30		31-40		41-50		51-60		61-70		71-80		Total		Total Cases
Histologic Type	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Nodular Goiter	0	0	0	2	2	5	2	6	1	5	0	5	0	0	5	23	28

Hashimoto's thyroiditis	0	0	0	0	1	2	0	1	0	0	0	0	0	0	1	03	04
Lymphocytic thyroiditis	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	01	01
Follicular Adenoma	0	1	0	4	0	5	1	2	0	0	0	0	0	0	1	12	13
Hurthle cell adenoma	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
Papillary Ca.	0	0	0	0	0	2	0	1	2	0	0	0	0	0	2	3	5
Follicular Ca.	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	4	4
Medullary Ca.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
Non-Hodgkin's Lymphoma	0	0	0	0	0	0	0	1	0	0	0		0	1	0	2	2

Among 4 cases of Follicular Carcinoma, all 4 of them (100%) were female patients and 2 cases belonged to 51-60 years and remaining 2 belonged to 41-50 years (Table 5). Out of 2 cases of Non –Hodgkin's Lymphoma, both were female patients, one was aged 43 yrs and the other 74 yrs. Only one male patient aged 65 years was reported having medullary carcinoma thyroid in this study.

DISCUSSION

Diffuse, asymmetric thyroid enlargement was seen in 28/59 (47.46%) cases, whereas 15/59 (25.42%) specimens were well defined, encapsulated and had solitary nodular surface. Out of total 59 cases, External surface of 2 (3.39%) thyroidectomy specimens showed infiltration into the surrounding tissue and 1 (1.69%) thyroid lesion was well circumscribed but non-capsulated.

On Gross, Largest thyroidectomy specimen measured 10.8 x 6.5 x 4.3 cm which was diagnosed as follicular carcinoma microscopically. On gross, smallest thyroidectomy specimen which was removed by hemithyroidectomy procedure, measured 5 x 3 x 1.8 cm and weighed 28 grams which was diagnosed as nodular colloid goiter microscopically.

Among 26 cases provisionally diagnosed as solitary thyroid nodule on clinical examination, 10/26 (38.46%) cases were reported as nodular colloid goiter which was most common non-neoplastic lesion in present study. In present study, among solitary thyroid nodule, 9/26 (34.61%) cases were diagnosed as follicular adenoma, 3/26 (11.54%) cases as papillary carcinoma, 2/26 (7.70%) cases as follicular carcinoma, 1/26 (3.84%) case of Hashimoto's thyroiditis and 1/26 (3.84%) case as Hurthle cell adenoma on histopathological examination (Table 6).

Table 6: Distribution of cases according to USG findings

USG results	Cases	%-age
Colloid goiter/MNG	26	47.27
Cystic nodule	01	1. 82
Thyroiditis	05	9.10
Solitary Adenoma	12	21.81
Malignant neoplasm	11	20.0
Total	55	100

Ultrasonography (USG) findings were available in 55 (93.22%) cases out of total 59 cases. Out of these 55 cases, maximum number of cases 26 (47.27%) were reported as colloid goiter/MNG on USG. Malignant neoplasm was reported in 11 (20.0%) cases.

Furthermore, positive correlation was seen between USG and histopathological diagnosis in 49 (89.09%) cases out of 54 cases.

Comparison of type of surgical procedure with other studies

In the present study, Hemithyroidectomy (54.24%) was the most common type of surgery performed which was concordant with the studies done by Choudhary et al (2019) and Dhanaram B et al. (2017). Table 7 represents comparison of various studies based on peak age.

Table 7: Comparison of peak age in this study with other studies

Authors	Year of study	Peak age (Years)
Modi et al. [12]	2018	21-40
Solomon et al. [13]	2015	30-39
Cameselle et al. [14]	2017	21-40
Halbhavi SN et al. [15]	2018	31-40
Present study	-	31-40

CONCLUSION

A two year cross sectional study was performed to study histopathological findings in thyroidectomy specimens at our institute.

The outcomes of the study revealed that variety of thyroid lesions are observed in thyroidectomy specimens. Most common lesion observed was nodular colloid goiter followed by follicular adenoma. Among all, papillary carcinoma was

the most frequently seen thyroid malignancy. Thyroid lesions are more common in females, solitary thyroid nodule occurring in a male requires a thorough evaluation as chances of harboring malignancy are higher in males.

Hence each and every thyroidectomy specimen must be sent for histopathological examination and studied meticulously, as some unusual findings bearing implications on treatment and prognosis may be seen, regardless of the reason for which thyroidectomy is performed.

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