

Clinicopathological correlation of neoplastic follicular lesions of thyroid

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Abstract

Background: Thyroid may be affected by various disorders like developmental, inflammation, hyperplastic and neoplastic that may present with similar sign and symptoms. Almost any disorder of thyroid can present as a nodule. The aim of this study is to discuss various histopathological types of thyroid neoplasms and to correlate various histomorphological features with respect to Clinical details. **Materials and Methods:** All patients diagnosed on microscopy with neoplastic follicular lesions between the period of January 2018 to December 2019 (Minimum 5 slides per patients will be studied). **Results:** A total of 282 thyroid specimens were received over a period of five years, representing 1.21% of all the cases seen at the pathology department of SMBT Institute of Medical Sciences and Research centre. Neoplastic lesions were found in 204 cases (72.34%) of thyroidectomy specimens and were mainly adenomas and carcinomas. 78.92% cases were found to be females and 21.08% cases were males with a female: male ratio of 3.75:1. Among total of 204 neoplastic lesions, 55 cases were adenomas (26.96% of the neoplastic category) with a female: male ratio of 4.5:1. 43 cases of follicular adenoma and 12 cases of Hurthle cell adenoma were diagnosed accounting for 21.08% and 5.88% respectively of all neoplastic thyroid lesions. **Conclusion:** Thus in conclusion, females accounted for 78.92% of patients with neoplastic thyroid lesions and the incidence peaked at a younger age. Papillary carcinoma was the most frequent thyroid cancer accounting for 85.14% of thyroid cancers and follicular adenoma was the common benign tumor. There appears to be a slightly increased trend of papillary carcinoma diagnosis. The main indication of surgery was a suspicious thyroid nodule.

Key Words: Thyroid, malignancy, histopathology

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INTRODUCTION

Thyroid being an actively functioning gland is subjected to series of disturbances, both physiological and pathological. It may be affected by various disorders like developmental, inflammation, hyperplastic and neoplastic that may present with similar sign and symptoms. Almost

any disorder of thyroid can present as a nodule. The thyroid nodule is common problem faced by the clinicians as they cause apprehension due to their unpredictable behaviour.¹ Prevalence of palpable thyroid nodule in non-iodine deficient area is about 4-7% in general adult population and 0.2 to 1.5 % in children. Now days due common use of USG in clinical practice the incidence of thyroid nodule has rises to 14- 50%. Benign lesions are more common in thyroid and less than 5% are actually malignant. In India the scenario is quite different. India has world's biggest "goitre Belt" in the subhimalayan region and the average prevalence of goitre is around 40%. Though goitre is quite common, cancer of thyroid is comparatively rare constituting less than 1% of cancer.² Both benign and malignant lesions of thyroid commonly present with a nodule. Since most of the thyroid nodules are benign it is essential to identify patients who are likely to be benefited from surgery and

thus avoid essential diagnostic surgery in all cases. This has been attempted on the basis of several diagnostic tools like clinical examination, TSH level, ultrasound, Thyroid scan and FNAC.³ FNAC is a good tool. But it also has got some limitations. Some of the FNAC related problems can be solved by USG guided FNAC which helps in taking sample from more representative area.⁴ Benign nodules can be caused by adenomas, colloid nodules, cysts, infectious nodules, lymphocytic or granulomatous thyroiditis, hyperplastic nodules, and congenital anomalies. Malignant nodules are classified as: Differentiated: a) papillary adeno-carcinoma, and b) follicular adeno-carcinoma, medullary carcinoma, undifferentiated a) small cell, b) giant cell, and c) carcinosarcoma, and miscellaneous - a) lymphoma/sarcoma, b) squamous cell carcinoma, c) fibrosarcoma, d) mucoepithelial carcinoma, and e) metastatic tumors.⁵ The aim of this study is to discuss various histopathological types of thyroid neoplasms, to correlate various histo-morphological features with respect to Clinical details.

MATERIALS AND METHODS

Number of subjects:All patients diagnosed on microscopy with neoplastic follicular lesions between the period of January 2018 to December 2019 (Minimum 5 slides per patients will be studied).

Inclusion criteria:All patients diagnosed on microscopy with neoplastic follicular lesions between the period of January 2018 to December 2019

Exclusion criteria:All other thyroid lesions apart from those mentioned above

Study design:Retrospective observational

Duration of study:2 years

The material for this study consisted of thyroidectomy specimens including lobectomy, partial thyroidectomy, subtotal thyroidectomy and total thyroidectomy. The decision to operate on the patient was based on clinic radiological findings, cytology and other relevant laboratory investigations. Every patient was preoperatively assessed by FNAC. Some of the patients had undergone thyroid scanning and ultra sonography of thyroid gland. Detailed information regarding age, gender, clinical details(hypothyroid, hyperthyroid and euthyroid), relevant investigations like Fine Needle Aspiration Cytology, USG reports, thyroid scan and operative findings were obtained from histopathological report forms. Gross features of the specimen received were recorded. Representative tissue was taken and after processing the tissue, routine staining was carried out with haematoxylin and eosin (H and E) stain. For retrospective study the histopathology slides were retrieved and reviewed. The thyroid diseases were classified on histological grounds into non-neoplastic and neoplastic lesions that were further sub-classified as benign and malignant as per the WHO histological classification of thyroid tumours.

Statistical Analysis:The data was subsequently analyzed and presented in a tabulated form with the help of Microsoft office 2007.

RESULTS

Table 1: Gender distribution as per histologic type

Histologic Type	Gender		Total
	Female	Male	
Follicular Adenoma	34	9	43
Hurthle cell Adenoma	11	1	12
Papillary Ca	102	24	126
Follicular Ca	8	6	14
Medullary Ca	5	3	08
WDT-UMP	1	0	01
Total	161	43	204

Table 2: Age distribution of patients with neoplastic thyroid lesions

Age (in years)	Benign			Malignant		WDT-UMP	Total (%)
	Follicular Adenoma	Hurthle cell Adenoma	Papillary Carcinoma	Follicular Carcinoma	Medullary Carcinoma		
<19	3	2	12	1	-	-	18 (8.82)
20-29	11	3	38	2	2	-	56 (27.45)
30-39	12	2	32	3	2	1	52 (25.49)
40-49	12	4	21	1	3	-	41 (20.10)
50-59	1	1	15	5	1	-	23 (11.27)
60-69	4	-	05	2	-	-	11 (5.39)
70-79	-	-	03	-	-	-	3 (1.47)
Total	43	12	126	14	8	1	204 (100)

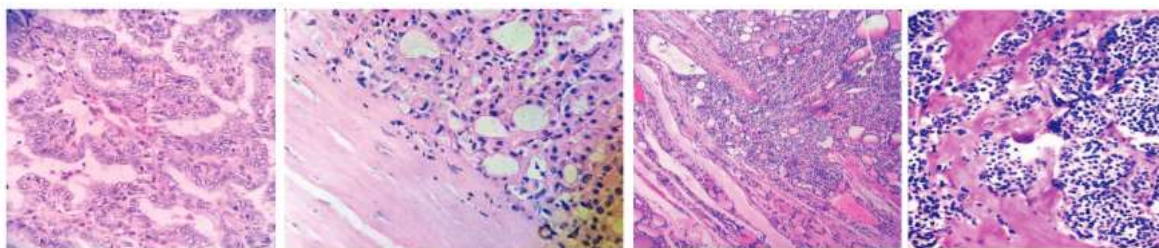


Figure 1

Figure 2

Figure 3

Figure 4

Figure 1: Microscopy of papillary carcinoma thyroid (400x); **Figure 2:** Microscopy of Follicular Adenoma (100x); **Figure 3:** Microscopy of Follicular carcinoma (100x); **Figure 4:** Microscopy of Medullary carcinoma (100x)

A total of 282 thyroid specimens were received over a period of five years, representing 1.21% of all the cases seen at the pathology department of SMBT Institute of Medical Sciences and Research centre Medical College. Neoplastic lesions were found in 204 cases (72.34%) of thyroidectomy specimens and were mainly adenomas and carcinomas. 78.92% cases were found to be females and 21.08% cases were males with a female: male ratio of 3.75:1. Among total of 204 neoplastic lesions, 55 cases were adenomas (26.96% of the neoplastic category) with a female: male ratio of 4.5:1. 43 cases of follicular adenoma and 12 cases of Hurthle cell adenoma were diagnosed accounting for 21.08% and 5.88% respectively of all neoplastic thyroid lesions (Table 1). The age of the studied benign thyroid neoplastic lesions ranged from 9 years to 65 years with a mean age of 38.11 years and the relative peak age of incidence was seen in 40-49 years age group (29.09%). The young age group (≤ 20 years) and the elderly age group above 60 years constituted 9.09% and 7.27% of cases respectively. In this study one patient of 35 years age was diagnosed as having Well-differentiated tumour of uncertain malignant potential (WDT-UMP) as there were suspicious nuclear features seen, with no capsular invasion. Malignant thyroid lesions accounted for 72.55% (n=148) of all neoplastic lesions. The age of the studied malignant thyroid neoplastic cases ranged from 9 years to 74 years with relative peak age of incidence in the age group of 20-29 years followed by 2nd highest peak in 30-39 years age group. The female-male ratio for malignant thyroid lesion was 3.5:1 (Table 2). Papillary carcinoma was the commonest malignant tumour in this study seen in 85.14% (n=126) of all malignant lesions. Of these cases, 24 (19.04%) were males and 102 (80.95%) were females with a female: male ratio 4.25:1. Most of the patients (n=38; 30.16%) were between 20-29 years of age. 14 cases of follicular carcinoma and 08 cases of medullary carcinoma were encountered in this study, comprising of 09.45% and 05.40% of all malignant neoplasms respectively. No case of anaplastic carcinoma was seen in our study.

DISCUSSION

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.⁶ This study was conducted in the department of Pathology, SMBT Institute of Medical Sciences and Research centre with an aim of discussing the various types of thyroid neoplasm and their clinical correlation. For this study, 282 thyroid specimens were studied by detailed history and histopathological examinations. In our study thyroidectomy specimens constituted 1.21% of all the surgical pathology specimens received in our department.⁷ Abdulla *et al.* (2006) also found that thyroid specimens constituted 1.5% of all histopathology specimens in their study. Historically thyroid diseases have been found to have a female preponderance owing to the presence of estrogens receptors in the thyroid tissue. There were 78.92% female cases and 21.08% male cases in our study with a female: male ratio of 3.75:1. Similar results have been found in the studies conducted by Ashwini *et al.* (2014), Gupta A *et al.* (2016), Salama *et al.* (2009), Fahim *et al.* (2012) and Mandal S, *et al.*⁸ In our study the age of patients ranged from 9-65 years in benign neoplasms with a mean age of 38.11 years and 9-74 years in malignant neoplasms with mean of 40.2 years. Similar results were found by a study conducted by Darwish *et al.* (2006), where the age range was 21-82 years in malignant lesions and 20-69 in adenomas.⁹ In the study conducted by Singh P *et al.* (2000), of 108 cases age range was 12-80 years, mean age was 47 years. Similar results were found by Fahim *et al.* (2012) and Veyseller *et al.* (2009). The peak age of incidence in our study was 40-49 years age group for benign neoplasms and 20-29 years age group for malignant neoplasms which is in accordance with the study of Gupta A *et al.* (2016) who found 21-40 years age group as the peak age for thyroid diseases. Islam *et al.* (2009), showed the majority of the patients were within 21-40 years of age.⁹ In our study, malignant lesions predominated over benign adenomas within the neoplastic category. Our findings in this regard are similar to the study of Abdulkaderet *et al.*

(2014) who reported 81 neoplastic cases, among which 88.8% were malignant. Papillary carcinoma was the most common malignant thyroid lesion and constituted 85.14% of the malignant lesions in our study. This observation was in accordance with the study of Chukudebelu *et al.* (2012), Abdulkader *et al.* (2014) and Gupta A *et al.* (2016). Our results are consistent with the international remote and recent data regarding the pattern and frequency of neoplastic diseases of thyroid, including the predominance of papillary carcinoma. Our finding regarding increased trend of papillary carcinoma diagnosis among malignant thyroid tumours is also consistent with that of Yang *et al.* (2013), Yildiz *et al.* (2014) and Amphlett *et al.* (2013). Follicular adenoma was the commonest benign thyroid neoplasms in our study accounting for 78.18% of benign neoplasms which is in accordance with Ariyibi *et al.* (2013) who found 89.5% cases to be follicular adenomas.¹⁰

CONCLUSION

Thus in conclusion, females accounted for 78.92% of patients with neoplastic thyroid lesions and the incidence peaked at a younger age. Papillary carcinoma was the most frequent thyroid cancer accounting for 85.14% of thyroid cancers and follicular adenoma was the common benign tumour. There appears to be a slightly increased trend of papillary carcinoma diagnosis. Further detailed study of cellular features of papillary thyroid carcinoma is needed. Application of newer classification system of Follicular variant of papillary thyroid carcinoma is needed to minimize the surgical interventions for indolent thyroid nodules.

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