

## CLINICO-HISTOPATHOLOGICAL STUDY OF THYROID LESIONS IN A TERTIARY CARE CENTER OVER A PERIOD OF ONE YEAR

Pathivada Urmiladevi<sup>1</sup>, Ponnada Sravani<sup>2</sup>, Bhagyalakshmi Atla<sup>3</sup>, Seeram Satish Kumar<sup>4</sup>, Kamireddy Srikanth Reddy<sup>5</sup>, Latchupatula Lavanya<sup>6</sup>, Mantripragada Vidya Soundarya Lahari<sup>7</sup>

<sup>1</sup>Assistant Professor, Department of Pathology, Andhra Medical College, Visakhapatnam, Andhra Pradesh.

<sup>2</sup>Assistant Professor, Department of Pathology, Andhra Medical College, Visakhapatnam, Andhra Pradesh.

<sup>3</sup>Professor and HOD, Department of Pathology, Andhra Medical College, Visakhapatnam, Andhra Pradesh.

<sup>4</sup>Senior Resident, Department of Pathology, Andhra Medical College, Visakhapatnam, Andhra Pradesh.

<sup>5</sup>Postgraduate, Department of Pathology, Andhra Medical College, Visakhapatnam, Andhra Pradesh.

<sup>6</sup>Postgraduate, Department of Pathology, Andhra Medical College, Visakhapatnam, Andhra Pradesh.

<sup>7</sup>Postgraduate, Department of Pathology, Andhra Medical College, Visakhapatnam, Andhra Pradesh.

### ABSTRACT

#### BACKGROUND

Thyroid nodules are common in clinical practice, occurring globally with wide variation in incidence and histopathological pattern related to age, sex, dietary and environmental factors.

This study was undertaken to describe the spectrum, frequency, age, sex distribution and various histopathological patterns of thyroid lesions.

#### MATERIALS AND METHODS

The present study is a hospital based prospective observational study conducted for a period of one year from January 2017 to December 2017, and was conducted in the Department of Pathology, Andhra Medical College, Visakhapatnam. Tissue samples for H&E sections were fixed in 10% formalin and subjected to routine paraffin embedded processing and stained with Haematoxylin and Eosin. Various histopathological patterns were observed and compared.

#### RESULTS

Out of total 160 cases of thyroid lesions, maximum number of lesions were seen in patients in the age group of 31-40 years (n=49, 30.62%) with male to female ratio of 1: 9.66. Most common clinical symptom was midline neck swelling. Out of 160 cases, 100 cases (62.5%) were diagnosed as non-neoplastic and remaining 60 cases (37.5%) as neoplastic.

#### CONCLUSION

Identification of thyroid malignancy requires proper diagnostic tools, including clinical history, ultrasonography and proper pathological examination. Diagnosis by Histopathological examination is important for the prompt diagnosis and treatment of neoplastic lesions.

#### KEYWORDS

Thyroid, Medullary Carcinoma, Papillary Carcinoma.

**HOW TO CITE THIS ARTICLE:** Urmiladevi P, Sravani P, Bhagyalakshmi A, et al. Clinico-histopathological study of thyroid lesions in a tertiary care center over a period of one year. J. Evid. Based Med. Healthc. 2018; 5(32), 2374-2379. DOI: 10.18410/jebmh/2018/490

#### BACKGROUND

The thyroid gland is unique among endocrine organs in many ways.<sup>1</sup> It is the largest of all endocrine glands and by virtue of its superficial location is the only one, i.e., amenable to direct physical examination and biopsy.<sup>2</sup>

Thyroid cancer is the most frequent endocrine malignancy. Although thyroid nodules are common, differentiated and undifferentiated thyroid carcinomas are relatively rare, constituted 0.5% to 1% of all cancer worldwide.<sup>3</sup>

Most of the nodules are benign, and only 5% are considered to be malignant.<sup>4</sup> precise diagnosis of thyroid nodule is necessary for correct clinical management of patients and to avoid needless surgical interventions. Histological classification of thyroid tumours is essential for further therapy and prognosis.<sup>5</sup>

From a clinical perspective, the possibility of neoplastic disease is of major apprehension in patients who present with thyroid nodules. For most of the thyroid tumours, a diagnosis can be reached by morphologic assessment alone; so, the classification of various histomorphological features

Financial or Other, Competing Interest: None.  
Submission 11-07-2018, Peer Review 19-07-2018,  
Acceptance 27-07-2018, Published 02-08-2018.

Corresponding Author:

Dr. Ponnada Sravani,

Assistant Professor,

Department of Pathology,

Andhra Medical College, Maharanipeta,

Visakhapatnam- 530002, Andhra Pradesh.

E-mail: sravaniponnada@gmail.com

DOI: 10.18410/jebmh/2018/490



is important to classify the lesions into benign and malignant tumours.

This study was undertaken to describe the spectrum, frequency, age, sex distribution and various histopathological patterns of thyroid lesions.

## MATERIALS AND METHODS

### Study Design

The present study is a hospital based prospective observational study for a period of one year from January 2017 to December 2017, conducted in the Department of Pathology, Andhra Medical College, Visakhapatnam.

### Inclusion Criteria

Lobectomy, Hemithyroidectomy, subtotal thyroidectomy and total thyroidectomy specimens received for histopathological examination suspected for neoplastic and non-neoplastic lesions of thyroid.

### Exclusion Criteria

Cases on therapy and recurrent lesions and were excluded from the study.

**Study subjects:** In this study, a total of 160 patients with thyroid swellings were taken. A complete history of the patient pertaining to complaints were obtained. The clinical details were recorded as per the Performa along with ultrasonographic (USG) findings and related investigations were taken into consideration. Fine needle aspiration was done by using non aspiration technique except for cystic lesions. In case of non-diagnostic aspirates the procedure was repeated.

Post operatively, the cases were followed, specimens were collected in 10% formalin in fresh state and allowed to fix for 24 hours.

Detailed gross examination was done and bits were given. Paraffin embedded Haematoxylin and eosin stained sections were obtained and studied under light microscopy. The tumours were classified based on WHO classification of thyroid tumours.

**For statistical analysis:** Data was analysed using Microsoft Excel, chi-square test and P value <0.05 to establish the significance. Statistical package for social sciences (SPSS) software was used.

## RESULTS

In the present study, a total of 160 patients with thyroid swellings were taken for the study for a period of one year from January 2017 to December 2017.

The age of the patients ranged from 10 years to 70 years with a mean age of 37 years. Maximum number of lesions were seen in patients in the age group of 31-40 years (n=49, 30.62%) followed by 21-30 years (n=43, 26.87%) and 41-50 years (n=38, 23.75%). (Table 1)

In the present study, females were mostly commonly affected. It was observed that 145 (90.63%) cases were females and 15 (9.37%) cases were male. (Table 2) Male to female ratio was noted to be 1:9.66.

In the present study, most common clinical symptom was midline neck swelling seen in almost all cases (151 cases - 94.37%) followed by menstrual irregularity (24 cases - 15%) and dyspnoea (2 case - 1.25%).

In the present study, total thyroidectomies were most common, 74 cases-46.25%, followed by hemithyroidectomy specimens which were 66 cases - 41.25. Subtotal thyroidectomies constituted 3 cases - 1.87% and Lobectomies were 17 cases - 10.62%. (Table 3)

In the present study, out of total 160 cases, 100 cases (62.5%) were diagnosed as non-neoplastic and remaining 60 cases (37.5%) as neoplastic.

In the present study, among 100 cases of non-neoplastic lesions, nodular goitre 75 cases (75%) was found to be the most common followed by Adenomatous goitre 11 cases (11%), Hashimoto's thyroiditis 10 cases (10%) (Figure 1, 2). (Table 4)

In the present study, benign tumours were more common than malignant tumours. Out of 60 neoplastic lesions 34 cases (56.67%) were benign tumours and 26 cases (43.33%) were malignant tumours.

In the present study, among 60 cases of neoplastic lesions, follicular adenoma (34 cases - 56.67%) (Figure 3) was found to be the most common followed by papillary carcinoma (20 cases - 33.33%) (Figure 4, 5, 6, 7), medullary carcinoma (3 cases - 5%) (Figure 8, 9, 10) and Anaplastic carcinoma (2 cases - 3.33%) and one case of poorly differentiated carcinoma (1.66%). (Table 5) Ratio of non-neoplastic to neoplastic lesions is 1.66:1.

In the present study, out of 20 cases of papillary carcinoma, classic variant was seen in 14 cases - 70%, followed by follicular variant of papillary carcinoma 3 cases - 15%, micropapillary carcinoma 2 cases - 10% and one case of Encapsulated papillary carcinoma - 5%. (Table 6)

Out of 75 clinically diagnosed cases of multinodular goitre, 60 cases correlated with histopathological diagnosis, and out of 15 deferred cases, 8 cases turned out to be Hashimoto's thyroiditis, 3 cases turned out to be follicular adenoma, 3 cases turned out to be papillary carcinoma, one case was diagnosed as anaplastic carcinoma.

Out of 9 clinically diagnosed cases of solitary nodule thyroid, 3 cases turned out to be papillary carcinoma, 3 cases turned out to be multinodular goitre, two cases of colloid cyst and one case of follicular adenoma.

Out of 5 clinically diagnosed cases of papillary carcinoma, one case of each turned out to be multinodular goitre, Hashimoto's thyroiditis, poorly differentiated carcinoma, medullary carcinoma and anaplastic carcinoma respectively.

## DISCUSSION

In the present study, the age of the patients ranged from 10 years to 70 years with a mean age of 37 years which correlated with study conducted by Sathiyamurthy et al with 36.5 years whereas it was lower compared to Silverman et al and Arvintham et al with mean ages of 44.8 and 46 years respectively.<sup>6,7,8</sup>

In the present study, it was observed that 145 (90.63%) cases were females and 15 (9.37%) cases were male. The female to male ratio found in this study was 9.6:1, which compares favourably with 7:1, 6.2:1, 6:1 and 5.7:1 from studies conducted by Nzegwu et al, Nggada et al, Abdulkareem et al and Adeniji et al respectively.<sup>9,10,11,12</sup> This high prevalence in women is believed to be due to the physiological demands of puberty, menstruation, pregnancy and lactation.<sup>1</sup>

In the present study, total thyroidectomies were most common, 74 cases - 46.25%, followed by hemithyroidectomy specimens which were 66 cases - 41.25%. Chetan VR et al study noted hemi-thyroidectomies that comprised 66% compared to just 10% of hemi-thyroidectomies in Karthik Kathladka et al study.<sup>13,14</sup> In a study by Mattioli FP et al subtotal thyroidectomy was shown to be an adequate surgical intervention for MNG.<sup>15</sup>

A significant number of the cases in this study were non-neoplastic thyroid lesions constituting 62.5% of the cases. This observed preponderance of non-neoplastic lesions is in consonance with findings from Hill et al (60.5%) and Chung et al (84.1%).<sup>16,17</sup>

In the present study, among non-neoplastic lesions, nodular goitre 75 cases (75%) was found to be the most common lesion. This frequency is similar to the frequency recorded in earlier work done by Nzegwu et al (63.2%), Edino et al (68%), and Seleye et al (52.5%).<sup>9,18,19</sup>

In the present study, benign tumours were more common than malignant tumours. Out of 60 neoplastic lesions 34 cases (56.67%) were benign tumours and 26 cases (43.33%) were malignant tumours.

In the present study, among 60 cases of neoplastic lesions, follicular adenoma (34 cases - 56.67%) was found to be the most common. This was similar to studies done by Nzegwu et al and Edino et al.<sup>9,18</sup>

In the present study, malignancy was diagnosed in 26 cases - 16.25% of all the thyroid specimens received in this study. This was similar to the 10.9-14.1% in studies done by Nzegwu et al, Edino et al, and Seleye et al but higher than the 8.1% and 7% reported by Adeniji et al and Abdulkareem et al.<sup>9,18,19,12,11</sup>

The predominant histological type of thyroid carcinoma in this study was papillary carcinoma similar to Nzegwu et al and Seleye et al.<sup>9, 19</sup> This finding is however at variance with studies done by Nggada et al and Edino et al which found follicular carcinoma to be the most common thyroid cancer.<sup>10,18</sup>

Papillary carcinoma represented 12.5% of all the thyroid specimens and 76.92% of the malignant thyroid tumours. This was similar to studies done by Nzegwe et al (56.5%) and Seleye-Fubara et al (54.5%).<sup>9,19</sup>

Medullary carcinomas are relatively uncommon with only 3 cases (1.87%). This relative rarity agrees with findings from Nzegwe et al and Seleye-Fubara et al.<sup>9,19</sup>

In the present study, two cases of anaplastic carcinoma were seen (1.25%) similar to the reports of Nzegwu et al., Ngadda et al. (2008), Abdulkareem et al. and Seleye-Fubara et al.<sup>9,10,11,19</sup>

Following extensive histopathological evaluation of the resected specimens, various morphologic patterns were noted in the thyroid tissue surrounding the tumours. Morphology of peritumoral thyroid was significant in 5 cases: 2 cases had multinodular goiter, and Hashimoto thyroiditis was seen around 3 tumours. In a study by Campos et al of 41 cases of papillary carcinoma showed concurrent Hashimoto thyroiditis (26.8%).<sup>20</sup>

Papillary carcinoma and thyroiditis are both common conditions, the possibility of coincidental coexistence is more likely than an etiologic relationship.<sup>21</sup> Observations such as monoclonal origin of some hyperplastic nodules, occurrence of cytogenetic abnormalities, aneuploidy, and oncogenic mutations indicate that hyperplastic nodules over a long time may become neoplastic.<sup>22</sup>

**CONCLUSION**

Identification of thyroid malignancy requires proper diagnostic tools, including clinical history, ultrasonography and proper pathological examination. Diagnosis by histopathological examination is important for the prompt diagnosis and treatment of neoplastic lesions. This study accentuates the need of periodic assessment in middle aged female patients for early detection of papillary carcinoma. Early diagnosis and excision of lesion will provide relief for the patient and also decreases the problems arising from malignant lesions.

Age Group (years)	No. of Cases	Percentage
10-20	7	4.37%
21-30	43	26.87%
31-40	49	30.62%
41-50	38	23.75%
51-60	17	10.62%
61-70	6	3.75%
Total	160	100

**Table 1. Age Distribution of Thyroid Lesions**

Gender	No. of Cases	Percentage
Male	15	9.37%
Female	145	90.63%
Total	160	100

**Table 2. Sex Distribution of Thyroid Lesions**

Lesion	No. of Cases	Percentage
Colloid goitre	1	1%
Colloid cyst	2	2%
Nodular goitre	75	75%
Adenomatous goitre	11	11%
Hashimoto's thyroiditis	10	10%
Lymphocytic thyroiditis	1	1%
Total	100	100

**Table 3. Non-Neoplastic Lesions of Thyroid**

Lesion	No. of Cases	Percentage
Follicular adenoma	34	56.67%
Papillary carcinoma	20	33.33%
Anaplastic carcinoma	2	3.33%
Medullary carcinoma	3	5%
Poorly differentiated carcinoma	1	1.66%
Total	60	100

**Table 4. Neoplastic Lesions of Thyroid**

Variant	No. of Cases	Percentage
Papillary carcinoma	14	70%
Micropapillary carcinoma	2	10%
Encapsulated papillary carcinoma	1	5%
Follicular variant papillary carcinoma	3	15%
Total	20	100

**Table 5. Variants of Papillary Carcinoma**

Lesion	Lobectomy	Hemi Thyroidectomy	Subtotal Thyroidectomy	Total Thyroidectomy	Total
<b>Non-neoplastic Lesions</b>					
Colloid goitre	-	1	-	-	1
Colloid cyst	-	2	-	-	2
Nodular goitre	6	26	2	41	75
Adenomatous goitre	3	7	-	1	11
Hashimoto's thyroiditis	-	1	-	9	10
Lymphocytic thyroiditis	-	1	-	-	1
<b>Neoplastic Lesions</b>					
Follicular adenoma	5	25	-	4	34
Papillary carcinoma	3	3	-	14	20
Anaplastic carcinoma	-	-	-	2	2
Medullary carcinoma	-	-	-	3	3
Poorly differentiated carcinoma	-	-	1	-	1
Total	17	66	3	74	160
Percentage	10.62%	41.25%	18.75%	46.25%	100

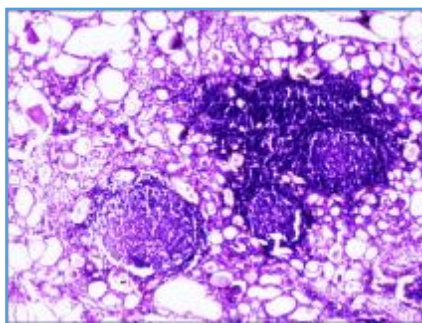
**Table 6. Distribution of Surgeries Performed for Non-neoplastic and Neoplastic Lesions**



**Figure 1. Gross Photograph of Hashimoto's Thyroiditis Cut Surface Appears Pale and Grey Tan**



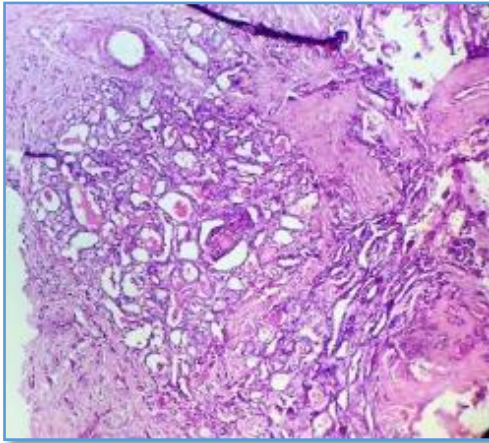
**Figure 3. Gross Photograph of Follicular Adenoma of Thyroid Showing a Solitary, Circumscribed, Capsulated Nodule**



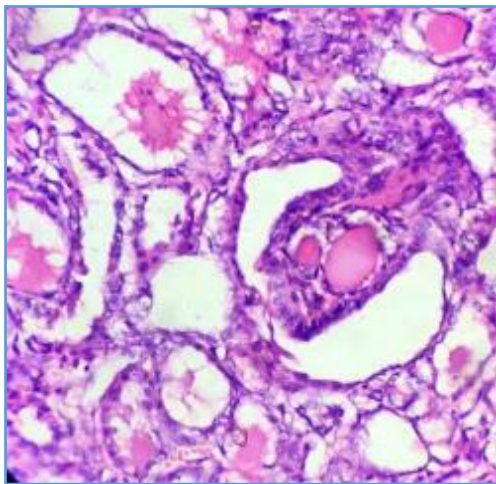
**Figure 2. Photomicrograph of Hashimoto's Thyroiditis with Follicles Lined by Hurthle Cells and Infiltration of Parenchyma by Mononuclear Inflammatory Infiltrates Containing Lymphoid Follicles with Germinal Centre (H&E 100X)**



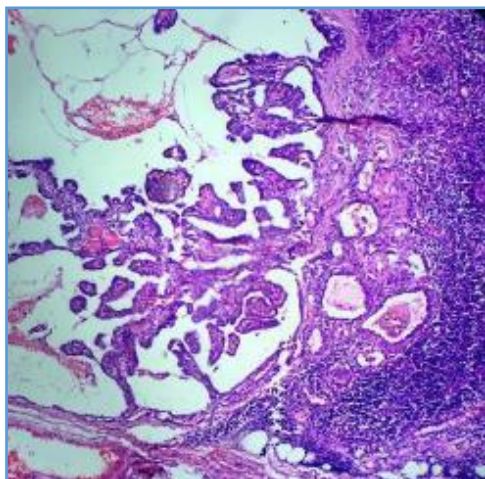
**Figure 4. Gross Photograph of Papillary Carcinoma of Thyroid Showing a Cystic Lesion Replacing the Entire Lobe with Papillary Excrescences**



**Figure 5. Photomicrograph Showing Papillary Carcinoma with Tumour Composed of Branching Papillae with Fibrovascular Stalk Covered by Cuboidal Epithelial Cells. (H&E 40X)**



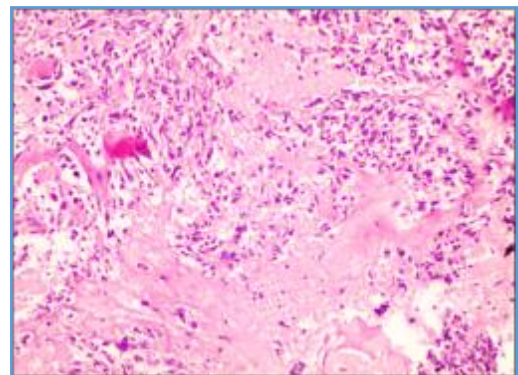
**Figure 6. Photomicrograph Showing Papillary Carcinoma with Tumor Composed of Branching Papillae with Optically Cleared Nuclei with Intra Nuclear Inclusions and Grooves. (H&E 400X)**



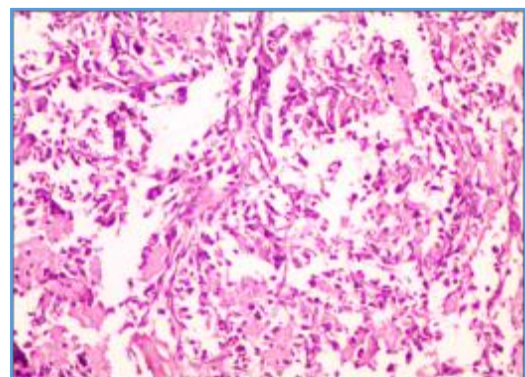
**Figure 7. Photomicrograph Showing Metastatic Deposits of Papillary Carcinoma in Lymph Node. (H&E 40X)**



**Figure 8. Clinical Photographs of Medullary Carcinoma in a 13-Year-Old Boy Who Presented with Dolichocephalic Head, Long Thin Upper and Lower Extremities, Swellings Over Oral Mucosa, Lips, Tongue and Having Bumpy Lips, Bilateral Diffuse Thyroid Swelling.**



**Figure 9. Photomicrograph showing Medullary Carcinoma with Tumour Composed of Spindle Cells in Nests, Trabeculae and Amyloid Deposits (H&E 40X)**



**Figure 10. Photomicrograph showing Medullary Carcinoma with Tumour Composed of Spindle Cells in Nests, Trabeculae and Amyloid Deposits (H&E 400X)**

**REFERENCES**

[1] Maitra, A. The endocrine system. Chap- 24. In: Mitchell R, Kumar V, Abbas A, et al, eds. Robbins and Cotran pathologic basis of disease. 8<sup>th</sup> edn. Philadelphia (PA): Saunders Elsevier 2011:164-165.

- [2] Carcangiu ML, DeLellis RA. Thyroid gland. Chap- 6. In: Damjanov I, James L, eds. *Anderson's pathology*. Vol. 2. 10<sup>th</sup> edn. St. Louis (MO): Mosby 1996:1943-1979.
- [3] Lawrence W, Kaplan BJ. Diagnosis and management of patients with thyroid nodules. *J Surg Oncol* 2002;80(3):157-170.
- [4] Welker MJ, Orlov D. Thyroid nodules. *Am Fam Physician* 2003;67(3):559-566.
- [5] DeLellis RA, Williams ED. Thyroid and parathyroid tumours. Chap- 2. In: DeLellis RA, Lloyd RV, Heitz PU, et al, eds. *World Health Organisation classification of tumours, pathology and genetics, tumours of endocrine organs*. Lyon: IARC Press 2004:49-52.
- [6] Sathiyamurthy K, Patil MS, Mirje M. Fine needle aspiration cytology study of thyroid lesions. *International J Current Res* 2014;6(10):9230-9233.
- [7] Silverman FJ, West RL, Larkin EW, et al. The role of fine needle aspiration biopsy in the rapid diagnosis and management of thyroid neoplasm. *Cancer* 1986;57(6):1164-1170.
- [8] Aravinthan T, Banagala ASK, Gamage KJPK. Use of fine needle aspiration cytology on thyroid lumps. *Galle Med J* 2007;12(1):25-27.
- [9] Nzegwu MA, Njeze GE, Olusina DB, et al. A histological update of thyroid lesions in Enugu, Nigeria: a 5-year retrospective study. *Asian J Exp Biol Sci* 2010;1(2):430-433.
- [10] Nggada HA, Ojo OS, Adelusola KO. A histopathological analysis of thyroid diseases in Ile-ife, Nigeria: a review of 274 cases. *Niger Postgrad Med J* 2008;15(1):47-51.
- [11] Abdulkareem FB, Banjo AA, Elesha SO. Histological review of thyroid lesions: a 13-year retrospective study (1989-2001). *Niger Postgrad Med J* 2005;12(3):210-214.
- [12] Adeniji KA, Anjorin AS, Ogunsulire A. Histological pattern of thyroid diseases in a Nigerian population. *Niger Q J Hosp Med* 1998;8:241-244.
- [13] Rahul Chetan V, Veeresalingam B, Kishore Kumar M, et al. A study on the clinical manifestations and the incidence of benign and malignant tumors in a solitary thyroid nodule. *International Journal of Research in Medical Sciences* 2013;1(4):429-434.
- [14] Sanjeeva KK, Chandra B, Balakrishna MA, et al. Clinico-epidemiological study and treatment outcome of multinodular goiter at a tertiary care hospital. *J Clin Diagn Res* 2015;9(6):PC22-25.
- [15] Mattioli F, Torre G, Borgonovo G, et al. Surgical treatment of multinodular goiter. *Ann Ital Chis* 1996;67(3):341-345.
- [16] Hill AG, Mwangi I, Wanga L. Thyroid disease in a rural Kenyan hospital. *East Afr Med J* 2004;81(12):631-633.
- [17] Chung EB, Rogers N, White JE. Thyroid diseases in Black patients. *J Natl Med Assoc* 1977;69:573-577.
- [18] Edino ST, Mohammed AZ, Ochicha O. Thyroid gland diseases in Kano. *Niger Postgrad Med J* 2004;11(2):103-106.
- [19] Seleye-Fubara D, Numbere N, Etebu EN. Pathology of common diseases of the thyroid gland in Port Harcourt. *Port Hart Med J* 2009;3(3):312-317.
- [20] Campos LA, Picado SM, Guimaraes AV, et al. Thyroid papillary carcinoma associated to Hashimoto's thyroiditis. *Braz J Otorhinolaryngol* 2012;78(6):77-80.
- [21] Baloch, ZW, Livolsi VA. Pathology of thyroid and parathyroid disease. Chap- 13. In: Mills SE, Carter D, Greenson JK, et al, eds. *Sternberg's diagnostic surgical pathology*. Vol. 1. 4<sup>th</sup> edn. Philadelphia: Lippincott Williams and Wilkins 2004:562-569.
- [22] Rosai J. Thyroid gland. Chap- 9. In: Rosai J, ed. *Rosai and Ackerman's surgical pathology*. 10<sup>th</sup> edn. St. Louis (MO): Elsevier 2005:515-568.