

## Thyroid Lesions with Various Patterns – A Histopathological Study in A Tertiary Care Centre

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**Introduction:** Thyroid gland is unique among endocrine glands in many ways. Histopathological examination plays a major role in making a correct & accurate diagnosis of various lesions of thyroid, which has a profound impact on the further management of the patient.

**Aims and objectives :**To study the histopathological spectrum of various lesions of thyroid in patients presenting to a tertiary care center

**Materials and methods:** The present study is a retrospective study conducted in the Department of pathology, Dr.Shankarrao Chavan government medical college Nanded between January 2018 to June 2019. A total of 360 samples were included in the study.

**Results :** Our study revealed female preponderance of thyroid with predominant age group being 30-39 years . The most common non neoplastic and neo plastic thyroid disorder on HPE at our center was noted to be colloid goiter(61.4%) and Follicular adenoma(68.25%) followed by papillary carcinoma thyroid(17.46%).

**Conclusion :** In our setting we also have found out that the preponderance of Neoplastic lesion is much higher in comparison with Non-Neoplastic lesion , so it puts every surgeon and the pathologist on guard , not to neglect even the simplest of thyroid swelling ,early assessment and appropriate intervention will be the key.

**Keywords:** Colloid goitre,Follicular adenoma,Non – neoplastic,Neoplastic lesions

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### I. Introduction:

Thyroid gland is unique among endocrine glands in many ways. It is the largest of all endocrine glands, and because of its superficial location, it is amenable to direct physical examination, fine needle aspiration and surgical biopsy. It is one of the most sensitive endocrine gland of the body.

Thyroid gland is one of the most important organs, which plays wide physiological roles in the body. The hormones released from thyroid gland affect all body organs and keep the homeostasis and the body integrity<sup>1</sup>. According to various studies, it has been estimated that about 42 million people in India suffer from thyroid diseases. Thyroid diseases are different from other diseases in terms of their ease of diagnosis, accessibility of medical treatment, and the relative visibility that even a small swelling of the thyroid offers to the treating physician<sup>2</sup>

Thyroid gland is unique among the endocrine glands in that it can be affected by a wide spectrum of diseases ranging from functional and immunologically mediated enlargements to the neoplastic lesions. Thyroid diseases are amongst the commonly encountered disorders in any hospital.

In India, thyroid diseases are endemic in many parts of Goa, Gujarat, Kerala, and the Himalayan region.

Thyroid lesions are common among the general population and often represent a large proportion of endocrine referrals. The understanding of these diseases is greatly facilitated by understanding of normal thyroid anatomy and physiology. The incidence of various thyroid disorders shows a striking variation both on national and regional basis. The incidence shows a marked variation when endemic and non-endemic areas are compared<sup>3</sup>.

The diagnostic dilemma of the cytologist occurs in lesions of thyroid which are diagnosed as atypical or suspicious of malignancy in 15-30% cases<sup>4</sup>. Conclusively surgical biopsy supplemented by clinical data and radiological findings remains the most conventional method of diagnosis under present setting, where recent ancillary techniques are not available. Benign thyroid tumors are common, and although cancers are relatively rare, they represent the most common malignancies of the endocrine system. Thyroid tumors accounts for approximately 1% of all malignancies of the endocrine system. From a clinical standpoint, the possibility of neoplastic disease is of major concern in patients who present with thyroid nodules. The World Health Organisation published its second edition on the histological classification of thyroid tumors in 2004. Classification of thyroid tumors is essential for further therapy and prognosis<sup>5</sup>.

Even after 100 years, thyroid gland has been the subject of intense research and considerable attention due to the vast array of developmental, inflammatory, hyperplastic, immunologic and neoplastic disorders which are exceedingly common in clinical practice<sup>6</sup>

With improving awareness thyroid diseases are being increasingly diagnosed making them one of the most common non-communicable disease and most common endocrine disorder worldwide<sup>7</sup>. Histopathological examination plays a major role in making a correct & accurate diagnosis of various lesions of thyroid, which has a profound impact on the further management of the patient<sup>8</sup>.

Thyroid gland lesions appear to be common in and around our location, so the classification of various histopathological types of tumor is important to categorize the lesion into non neoplastic and neoplastic lesions of thyroid.

The present study is intended to study the various histomorphological changes of non neoplastic and neoplastic lesions in the medical college.

## **II. Aims and objectives:**

To study the histopathological spectrum of various lesions of thyroid in patients presenting to a tertiary care center.

## **III. Methodology:**

The present study is a retrospective study. The material for the present study included the thyroid specimens received at the Department of pathology, Dr. Shankar Rao Chavan government medical college Nanded between January 2018 to June 2019.

### **Study Tools:**

After obtaining clearance from the institutional ethics committee, the tissue specimen collected after thyroid surgery was fixed in 10% formalin. The tissues were processed routinely as per protocol, embedded in paraffin, cut to a thickness of 3-5 micron and stained by Haematoxylin and Eosin (H&E) stain.

The histopathology reports slides and paraffin blocks were obtained from the archives. Histopathological examination was done by a Pathologist and was classified into

Neoplastic and non-Neoplastic lesions. The thyroid neoplasm's were classified According to WHO classification

### **Sample size :**

All the samples obtained during the prescribed study period were included in the study. A total of 360 samples were included and the categorization of the same was done as neoplastic and non Neoplastic lesions.

### **Statistical analysis:**

The master chart of the collected data was prepared in Excel Sheet. The data was analyzed using statistical software Epi info 07 software and was Presented in the form of tables, figures, graphs and diagrams wherever necessary.

## **IV. Results:**

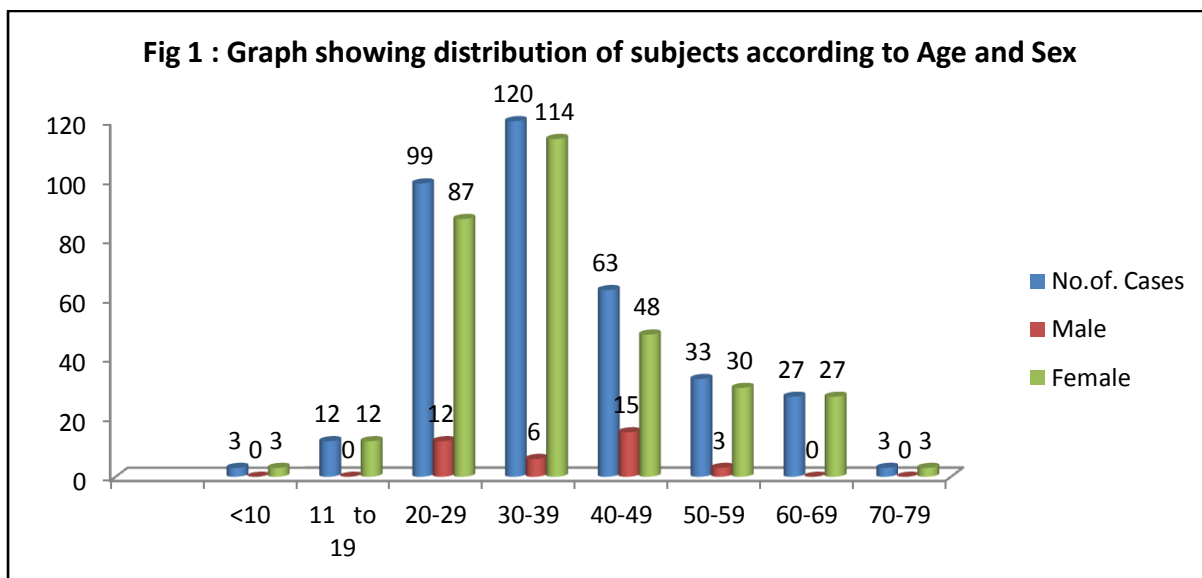
The present study was a retrospective study conducted in a medical college. Total of 360 thyroid specimens were included in the study. Our study revealed female preponderance of thyroid disorders with the predominant age group being 30-39 years, followed by 20-29 years.

Out of the 360 specimens studied 47.5% of them were non-neoplastic, the rest 52.5% were Neoplastic, (both Benign and Malignant) in nature.

**Table 1 : showing distribution of subjects according to Age and Sex**

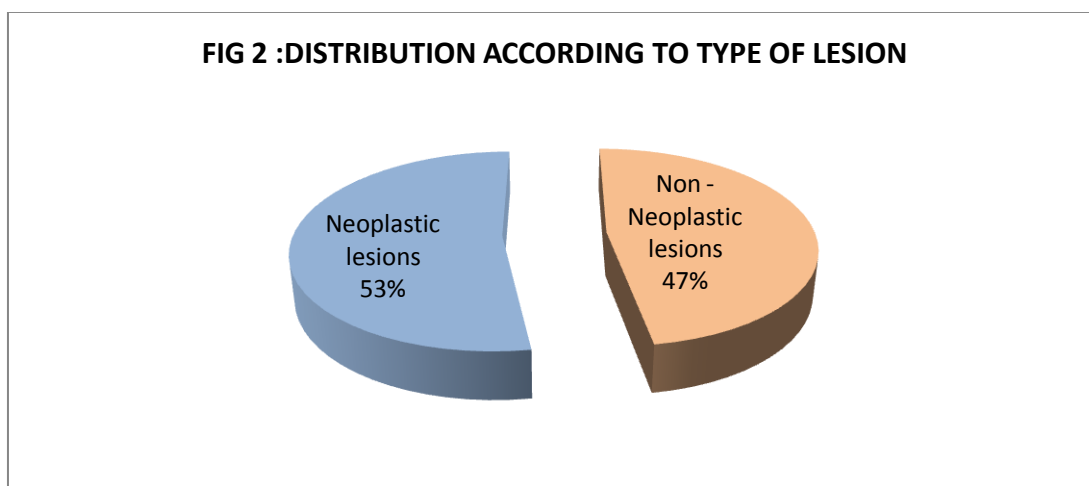
Sr. No	Age	No. of. Cases	Male	Female
1	<10	3	-	3
2	10-19	12	-	12
3	20-29	99	12	87
4	30-39	120	6	114
5	40-49	63	15	48
6	50-59	33	3	30
7	60-69	27	-	27

8	70-79	3	-	3
	Total	360	36(10%)	324(90%)



**Table 2: showing distribution of subjects according to Nature of Lesion**

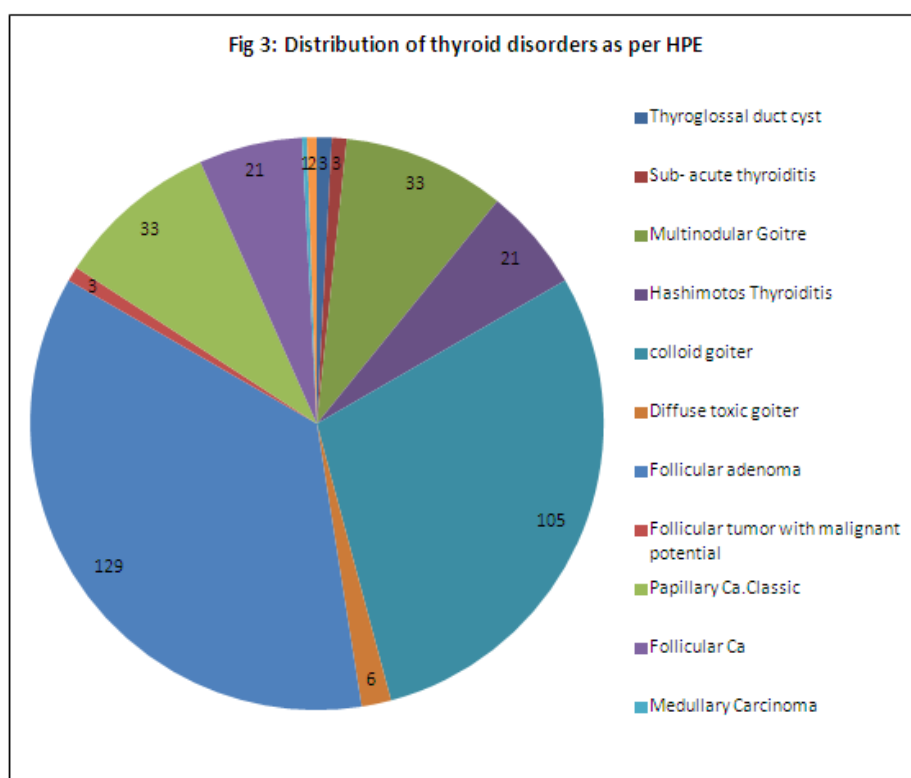
Sr. No	Morphologic type	No. of. Cases	%
1	Non - Neoplastic lesions	171	47.5
2	Neoplastic lesions	189	52.5



The most common non neoplastic thyroid disorder on HPE at our center was noted to be colloid goiter(61.4%) followed by Multinodular goiter (19.9%) and Hashimotos Thyroiditis(12.3%) . The most common neoplastic lesion Beningn was Follicular Adenoma(68.25%) . The most common neoplastic malignant disease was Papillary carcinoma of the Thyroid(17.46%) followed by Follicular Carcinoma (11.11%).

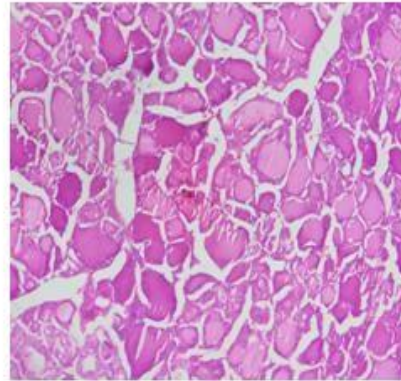
**Table 3: Showing distribution of types of thyroid lesions according to age group and sex as per HPE .**

SL.No	Age in years	<10		10-19		20-29		30-39		40-49		50-59		60-69		70-79		TOTAL
		M	F	M	F	M	F	M	F	M	F	M	F	M	F			
1	Thyroglossal duct cyst	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
2	Sub- acute thyroiditis	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	3
3	Multinodular Goitre	-	-	-	-	-	3	-	9	3	6	-	9	-	3	-	-	33
4	Hashimotos Thyroiditis	-	-	-	-	3	6	-	6	-	3	-	-	-	3	-	-	21
5	colloid goiter	-	-	-	6	3	18	-	33	3	24	-	12	-	6	-	-	105
6	Diffuse toxic goiter	-	-	-	-	-	3	-	3	-	-	-	-	-	-	-	-	6
7	Follicular adenoma	-	-	-	6	9	36	-	33	6	18	-	9	-	9	-	3	129
8	Follicular tumor with malignant potential	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	3
9	Papillary Ca.Classic	-	-	-	-	-	6	3	9	3	-	3	6	-	3	-	-	33
10	Follicular Ca	-	-	-	3	-	3	3	12	-	-	-	-	-	-	-	-	21
11	Medullary Carcinoma	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
12	Anaplastic Carcinoma	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2
	TOTAL	-	3	-	15	18	78	6	108	15	51	3	33	-	27	-	3	360

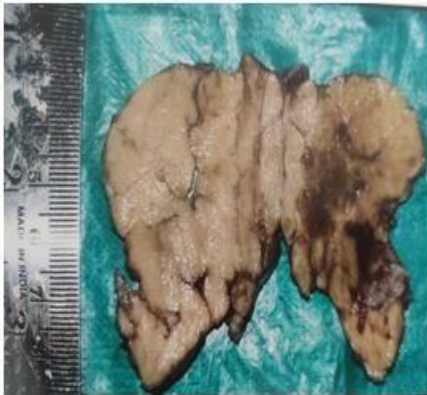




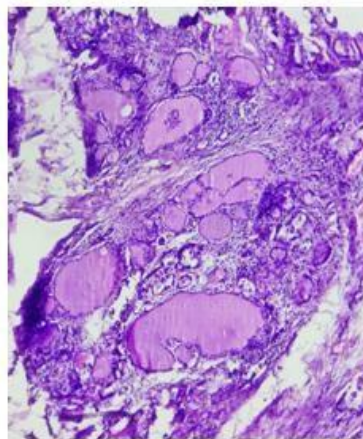
Pic-1: Gross specimen of Colloid goiter .On C/S - (Brownish fluid – colloid present )



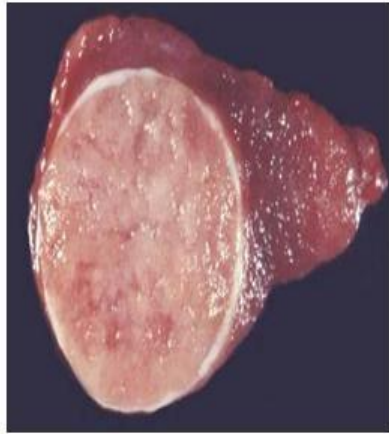
Pic-2: Microscopic appearance of Colloid goiter showing thyroid follicles of varying sizes containing abundant colloid . H & E stain (10X)



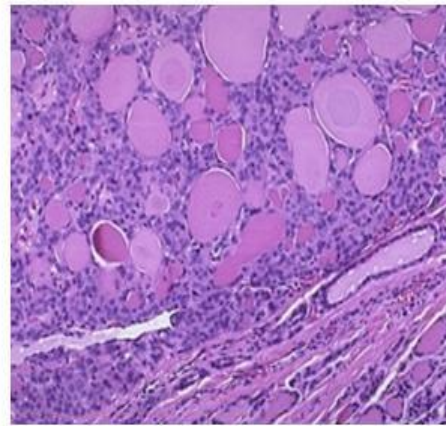
Pic-3: Gross specimen of Hashimoto's thyroiditis .On C/S – tan yellow appearance attributed to abundant lymphoid tissue



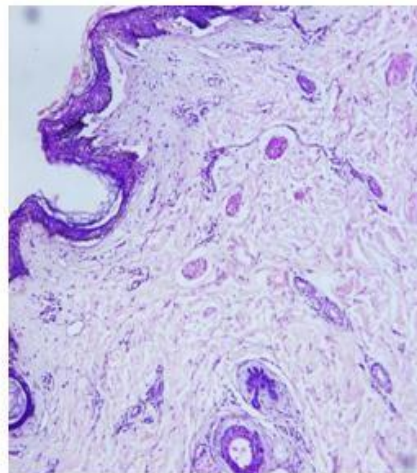
Pic-4: Microscopic appearance of Hashimoto's thyroiditis showing dense lymphoplasmacytic infiltration. H & E stain (10X)



Pic-5 : Gross specimen of Follicular Adenoma. On C/S – well encapsulated tan brown circumscribed nodule



Pic-6 : Microscopic appearance of Follicular Adenoma showing encapsulated tumor mass with microfollicular pattern of growth. H & E stain (40X)

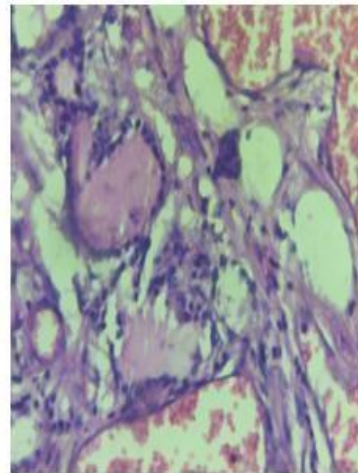


Pic-7 : Microscopic appearance of Thyroglossal cyst. H & E stain (40X)





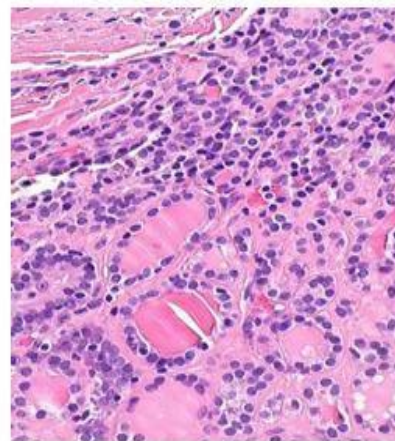
Pic-8 : Gross specimen of Multi Nodular goiter showing asymmetrically enlarged gland with multi nodularity



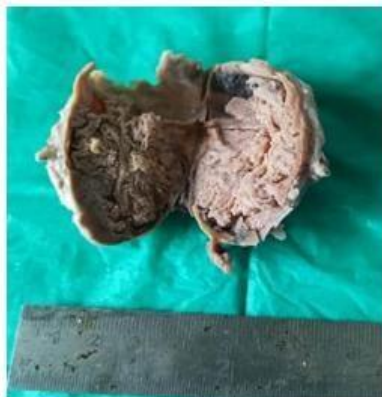
Pic-9 : Microscopic appearance of Multinodular goiter showing variably sized colloid filled follicles with areas of hemorrhages. H & E stain (40X)



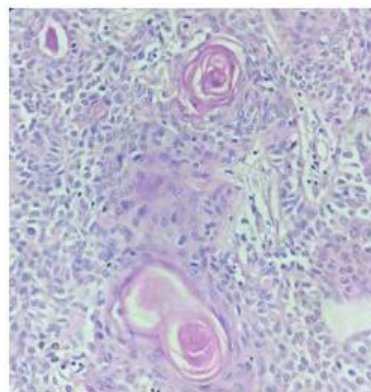
Pic-10 : Gross specimen of Follicular Carcinoma. On C/S - showing capsular invasion with areas of hemorrhage and necrosis



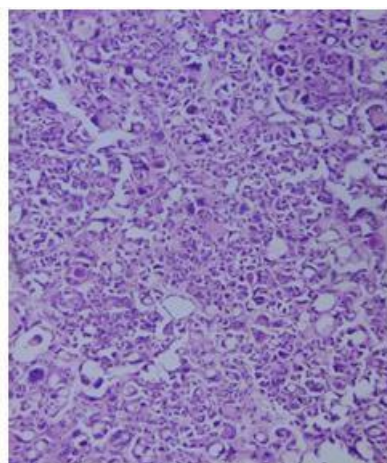
Pic-11 : Microscopic appearance of Follicular Carcinoma showing capsular invasion. H & E stain (40X)



Pic-12 : Gross specimen of Papillary thyroid carcinoma .On C/S – infiltrative mass with ill defined borders and sclerosis with papillary excrescences



Pic-13 : Microscopic appearance of Papillary thyroid carcinoma showing psammoma bodies H& E stain (40X)



Pic-14 : Microscopic appearance of Medullay carcinoma thyroid showing acellular homogenous eosinophilic amyloid material .H & E stain (10X)

### V. Discussion:

**Table: 4 PEAK AGE INCIDENCE OF THYROID LESIONS**

Study	Age incidence in years	%	males	females
Ramesh VL et al <sup>9</sup> (n=120)	30-39	33.3%	10%	90%
Ijomone EA et al <sup>10</sup> (n=163)	30-39	34.6%	9%	91%
Shrestha D et al <sup>11</sup> (n=100)	30-39	50%	-	-
<b>Present study(n=211)</b>	<b>30-39</b>	<b>33.33%</b>	<b>10%</b>	<b>90%</b>

A study done by Ramesh VL et<sup>9</sup> al found majority of thyroid lesions were in the fourth decade with forty cases (n=40, 33.3%). Thyroid enlargements were most common in the age group between 30-39 years; however, increased incidences

were also noted in third and fifth decade of life in their study.

Ijomone EA et al<sup>10</sup> studied the highest incidence of thyroid lesions in the age group between 30-39 years (n=46, 34.6%). The study done by Shrestha D et al<sup>11</sup> however reported higher incidence of 50% in a similar age group between 30-39 years (n=50, 50%) .



The preponderance of thyroid disorders among the female sex in our study is similar to the other study findings quoted in the table 4.

**Table 5: Non-neoplastic and neoplastic lesions of thyroid**

Study	Non neoplastic	Neoplastic
Salama SI et al <sup>13</sup>	58.5%	41.5%
Bharathidhasan I et al <sup>14</sup>	64.3%	35.7%
Albasri A et al <sup>15</sup>	72.3%	27.7%
Pradeep kumar NS et al <sup>12</sup>	49.4%	50.6%
<b>Present study</b>	<b>47.5%</b>	<b>52.5%</b>

The incidence of Neoplastic thyroid disorders were higher in comparison with the Non neoplastic lesions. Similar findings were noted in studies done by Pradeep Kumar NS et al<sup>12</sup>. However, in the studies conducted by Salama SI et al<sup>13</sup>, Bharathidhasan I et al<sup>14</sup> and Al Basri A et al<sup>15</sup> showed higher incidence of non neoplastic thyroid disorders.

**Table 6: Non-neoplastic lesions of thyroid**

STUDY	MULTINODULAR GOITER	HASHIMOTOS THYROIDITIS	COLLOID GOITER	THYROGLOSSAL CYST
Hussain N et al <sup>16</sup> (n=473)	86.2%	5.5%	3.1%	3.5%
Ramesh VL et al <sup>9</sup> (n=57)	61.4%	19.3%	12.28 %	1.75%
Martin AN et al <sup>17</sup> (n=114)	63.1%	2.6%	27.3%	2.6%
Bharathidhasan I et Al <sup>14</sup> (n=266)	25.3%	11.4%	36.8%	7.3%
<b>Present study (n=171)</b>	<b>19.29%</b>	<b>12.3%</b>	<b>61.4%</b>	<b>1.75%</b>

Among the Non neoplastic Thyroid disorders, the incidence of colloid goiter was 61.4% in our study and is similar to the study findings conducted by Bharathidhasan I et al<sup>14</sup>. However the incidence of the Multinodular goiter was more among the studies conducted by Hussain N et al<sup>16</sup> Ramesh VL et al<sup>9</sup> and Martin AN et al<sup>17</sup>. The incidence of the thyroglossal cyst was similar to the study findings by Ramesh VL et al<sup>9</sup> and Martin AN et al<sup>17</sup>.

**Table 6: Neoplastic lesions of thyroid**

Neoplastic lesions	Woolner et al <sup>18</sup>	Burn & Taylor <sup>19</sup>	Salama SI et al <sup>13</sup>	Bharathidhasan I et al <sup>14</sup>	Present study
	n=885	n=152	n=351	n=113	n=189
Follicular adenoma	-	-	26.7%	23.6%	<b>68.25</b>
Papillary carcinoma	61.1%	28.5%	59.7%	63.5%	<b>17.46%</b>
Follicular carcinoma	17.7%	28.5%	3.7%	10.8%	<b>11.11%</b>
Anaplastic carcinoma	14.7%	-	1.9%	0.7%	<b>1.05%</b>
Medullary carcinoma	6.5%	-	3.7%	0.7%	<b>0.53%</b>

The incidence of papillary carcinoma of thyroid (17.46%) followed by follicular carcinoma thyroid (11.11%) anaplastic carcinoma (1.05%) and Medullary carcinoma thyroid (0.53%). Our study findings were consistent with the study findings conducted by Woolner et al<sup>18</sup>, Salama SI et al<sup>13</sup> and Bharathidhasan I et al<sup>14</sup>.

## VI. Conclusion:

Thyroid disorders are commonly encountered endocrine diseases. Although non-invasive techniques like aspiration cytology provide a diagnosis in most, the ultimate answer often rests with histopathological examination of thyroidectomies. Appropriate categorization of neoplasms according to international guidelines, like World Health Organization, is mandatory not only for diagnostic accuracy, but also to follow a uniform reporting pattern and to rightly convey the microscopic findings to the treating clinician. In our setting we also

have found out that the preponderance of Neoplastic lesion is much higher in comparison with Non-Neoplastic lesion , so it puts every surgeon and the pathologist on guard , not to neglect even the simplest of thyroid swelling ,early assessment and appropriate intervention will be the key.

#### References:

- [1]. Mousavi SJ, Mikaili P, Mehdioghli R. Demographic and histopathological study of the thyroidopathies led to thyroid surgeries in Urmia Imam Hospital, North western Iran. *Annals Biol Res* 2011;2(5):38-43.
- [2]. Unnikrishnan AG, Menon UV. Thyroid disorders in India: An epidemiological perspective. *Indian J Endocr Metab* 2011;15(2):78-81.
- [3]. McHenry CR, Raeburn C, Strickland T, Marty JJ. The utility of routine frozen section examination for intraoperative diagnosis of thyroid cancer. *Am J Surg* 1996; **172**:658-661
- [4]. McHenry CR, Raeburn C, Strickland T, Marty JJ. The utility of routine frozen section examination for intraoperative diagnosis of thyroid cancer. *Am J Surg* 1996; **172**:658-661
- [5]. DeLellis RA, Williams ED. Thyroid and Parathyroid Tumours.Chapter 2. In: World Health Organisation Classification of Tumours, Pathology and Genetics, Tumours of Endocrine Organs. DeLellis RA, Lloyd RV, Heitz PU,Eng C. Eds. IARC Press: Lyon; 2004: 49-52
- [6]. Chandanwale S, Singh N, Kumar H, Pradhan P, Gore C, Rajpal M. Clinicopathological correlation of thyroid nodules. *Int J Pharm Biomed Sci* 2012; 3(3): 97-102
- [7]. Elizabeth Joseph, Anju Varghese, Celine T.M., Anna M, Usha P. A study on the histopathological pattern of thyroid lesions in a tertiary care hospital. *International journal of research in medical sciences*. 4(12), 2016, 5252-5255
- [8]. Vinay Kumar, Abul Abbas, Jon Aster. Robbins and Cotran, Pathologic Basis of Disease: South Asia Edition, Elsevier India 2014; 2(chapter 24).
- [9]. Ramesh VL, Sunitha S, Rupnarayan R, Murthy CN. Patterns of Thyroid Lesions: A Histomorphological Study. *Global Journal of Medical research:Microbiology and Pathology* 2014;14(6):29-34
- [10]. Ijomone EA, Duduyemi BM, Udoye E, Nwosu SO. Histopathological review of thyroid diseases in Southern Nigeria-A ten- year retrospective study. *Journal of Medicine and Medical Sciences* 2014;5(6):127-132
- [11]. Shrestha D, Shrestha S. The Incidence of Thyroid Carcinoma in Multinodular Goiter: A Retrospective Study. *Journal of College of Medical Sciences-Nepal* 2014; 10(4):18-21
- [12]. Pradeepkumar NS, Singh R, Joseph NM. Emerging trends in Thyroid diseases inTsunami Hit Coastal Areas of Puducherry and Cuddalore, India *Journal of Evolution of Medical and Dental Sciences* 2012; 1(5):857-863
- [13]. Salama SI, Abdullah LS, Al-Qahtani MH, Al Maghrabi JA.Histopathological Pattern of Thyroid Lesions in Western Region of Saudi Arabia.*The New Egyptian Journal of Medicine* 2009; 40(6): 580-585
- [14]. Bharathidhasan I, Goneppanavar M, Dhaka RS. Changing Trends in the Incidence of Thyroid Lesions in Coastal Regions of South India. *International Journal of Health Sciences and Research* 2015; 5( 6):134-141.
- [15]. Albasri A, Sawaf Z, Hussainy AS, Alhujaily A. Histopathological Patterns of Thyroid Disease in Al-Madinah Region of Saudi Arabia. *Asian Pac J Cancer Prev* 2014; 15 (14):5565-5570
- [16]. Hussain N, Anwar M, Nadia N, Ali Z. Pattern of Surgically treated Thyroid Disease in Karachi. *Biomedica* 2005;21:18-20
- [17]. Martin AN, Ezume ER, Njeze GE, Olusina DB, Ugochukwu AI. A Histological Update of Thyroid Lesions in Enugu,Nigeria:A 5 year Retrospective Study. *Asian Journal Experimental Biological Sciences* 2010;2:430-433
- [18]. Woolner LB,Beahrs OH,Black BM,McKonahey WM,Keating FR. classification and prognosis of thyroid carcinoma. *Am J Surg* 1961; 102:354-386
- [19]. Burn JI,Taylor SF. Natural history of thyroid carcinoma-A study of 152 treated patients. *Brit Med J* 1962; 1218-1223.

- [20]. WoolnerLB,BeahrsOH,BlackBM,McKonaheyWM,Keating FR. classification and prognosis of thyroid carcinoma. Am J Surg 1961; 102:354-386
- [21]. Burn JI,Taylor SF. Natural history of thyroid carcinoma-A study of 152 treated patients. Brit Med J 1962; 1218-1223.