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Spectrum of benign and malignant Thyroid nodules: A single institutional study

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Abstract
Thyroid gland is unique among the organs of endocrine system. Thyroid gland neoplasia constitutes total of 1% of all neoplasias and it has been observed that thyroid neoplasia is on an increase. Present study was a hospital based study to analyse the spectrum of thyroid nodules at a tretiary care centre from north India. On histopathology majority of the cases were benign 56.0% and 44.0% were malignant. The commonest benign lesion seen in thyroid was colloid goitre and among the malignant lesions papillary carcinoma was the most common neoplasm encountered in 78.4% of the patients. Thyroid disease is common in 4th decade of life. Benign lesions are more common in 4th decade of life and malignancy is common in younger age group.

Keywords: Thyroid, colloid goitre, papillary carcinoma, follicular adenoma

Introduction
Thyroid gland is unique among the organs of endocrine system because of its size and superficial location. It weighs approximately 15-20gm. Normal adult thyroid gland is composed of two lobes joined by the isthmus which lies across the trachea anteriorly, below the level of the cricoid cartilage [1]. The thyroid gland is made up of round or oval (20-40) follicles that vary considerably in size with an average diameter of 200 micrometer. They are lined by a single layer of follicular cells whose shape ranges from flattened to low-columnar depending on their degree of activity [2]. The cytoplasm has a pale acidophilic or amphophilic staining quality, the greater the activity of cell, the greater is its amount [3]. The proliferative activity of the follicular cells is related to age, being highest in the pre-natal group and lowest in adults [4].
Thyroid gland neoplasia constitutes total of 1% of all neoplasias and it has been observed that thyroid neoplasia is on an increase. Thyroid nodules can be benign or malignant. The commonest benign lesions being: Adenomatoid nodule, Colloid goitre, Hashimotos thyroiditis and Granulomatous thyroiditis. Papillary carcinoma thyroid (PTC) being the most common type of thyroid malignancy others include Follicular carcinoma, Medullary carcinoma [5].

Material methods
It was a hospital based study and was done in the department of pathology, Sher-i-Kashmir institute of medical science (SKIMS), Srinagar, Jammu and Kashmir. Data of the patients who presented with thyroid nodules from May 2006 to April 2013 was reviewed. The cases of thyroid swellings were searched from records maintained in the department of pathology at SKIMS. The histo-pathological reports of all such cases diagnosed during the above mentioned retrospective study period, were collected.

Inclusion criteria: All patients with thyroid swellings, irrespective of the age who have undergone histo-pathological examination of nodule were include in the study.

Observations
During the study period there were a total of 400 cases of thyroid lesions where histopathology was available. Total of 74 male patients and 326 female patients were seen resulting in male: female ratio of 1:4.4. Females comprised 81.5% and males comprised 18.5% of the total cases.

Maximum number of patients were seen in the age group of 31-40 years (3rd decade) followed by 21-30 years (2nd decade). On histo-pathological examination majority of the cases were benign 224 (56.0%) and 176 (44.0%) were malignant (Table-1). Histopathological spectrum of various thyroid nodules during the study period is given in Table-2. Benign lesions were more common in the age group of 31-40 years where as the malignant lesions were more in the age group of 21-30 years. The commonest benign lesion seen in thyroid was colloid goitre (FIG-1&2) in 55.8% of the patients followed by follicular adenoma in 26.8% of the patients (Table-3) while as among the malignant lesions papillary carcinoma (FIG-3&4) was the most common neoplasm encountered in 78.4% of the patients (Table- 4). In both benign and malignant groups, females outnumbered males with male to female ratio of 1: 5.4 in benign and 1: 3.5 in case of malignant lesions.

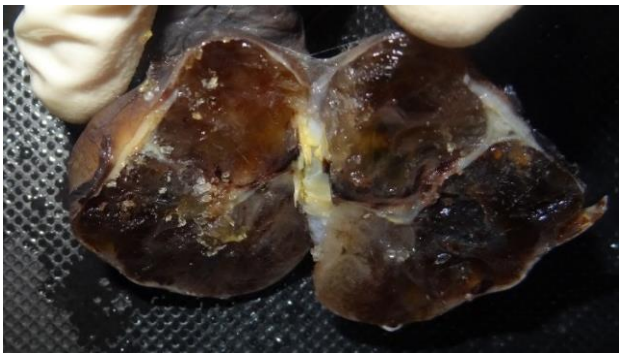

Fig 1: Gross photograph of colloid goitre showing lobe of thyroid gland filled with inssipiated Colloid

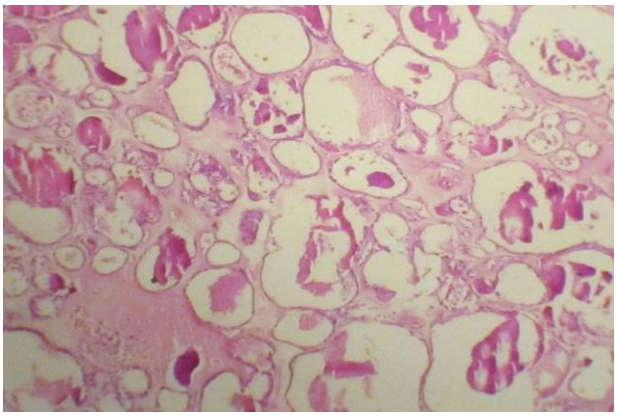

Fig 2: Photomicrograph of colloid goitre showing dilated follicles filled with colloid (H&E).

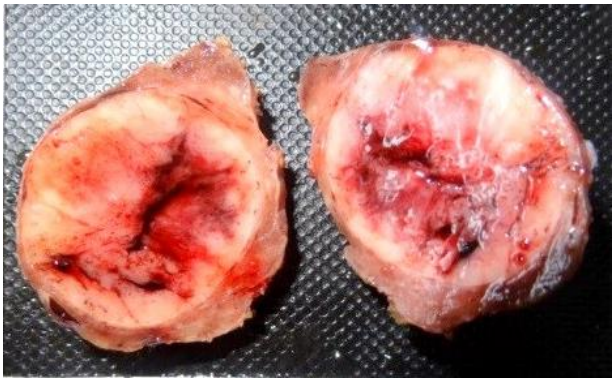

Fig 3: Gross photograph of papillary carcinoma thyroid.

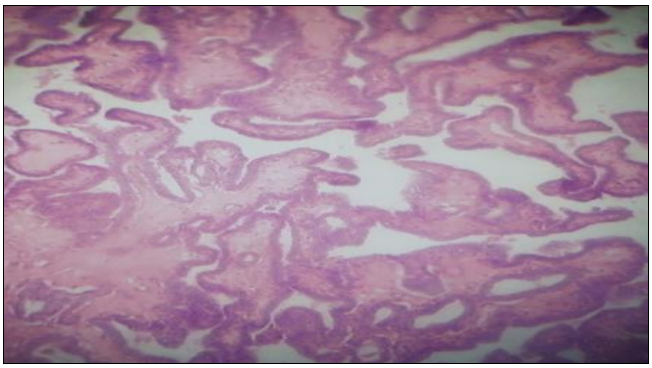

Fig 4: Photomicrograph of a case of papillary carcinoma thyroid showing papillae with fibrovascular core, (H&E)

Table 1: Histo-pathological spectrum of thyroid lesions

Histopathology	No. of cases	Percentage
Benign	224	56.0%
Malignant	176	44.0%
Total	400	100.0%

Table 2: Histopathological spectrum of various thyroid lesions

Histopathology	No. of cases	Percentage
Cavernous hemangioma	1	0.25%
Colloid goitre	125	31.25%
Follicular adenoma	60	15%
Follicular carcinoma	19	4.75%
Hashimotos thyroiditis	14	3.5%
Hurthle cell adenoma	18	4.5%
Hurthle cell carcinoma	10	2.5%
Medullary carcinoma	11	2.75%
NHL (large cell type)	1	0.25%
Papillary carcinoma	140	35%
Simple epithelial cyst	1	0.25%
Total	400	100%

Table 3: Histo-pathological spectrum of benign thyroid lesions

Histopathology	No. of cases	Percent
Cavernous hemangioma	1	0.4%
Colloid goitre	125	55.8%
Follicular adenoma	60	26.8%
Hashimotos thyroiditis	14	6.2%
Hurthle cell adenoma	18	8.0%
Lymphocytic thyroiditis	2	0.9%
Simple epithelial cyst	1	0.4%
Total	224	100%

Table 4: Histo-pathological spectrum of malignant thyroid lesions

Histopathology	Frequency	Percent
Follicular carcinoma	19	10.8%
Hurthle cell carcinoma	10	4.0%
Medullary carcinoma	11	6.2%
NHL (large cell type)	1	0.6%
Papillary carcinoma	140	78.4%
Total	176	100.0%

Discussion

Out of 400 cases 74 (18.5%) were males and 326 (81.5%) were females, with a male female ratio of 1:4.4.The age range was between 11-75 years with youngest being a case of papillary carcinoma thyroid and the oldest patient a female of colloid goitre. The highest number of cases were seen in the age group of 31-40 years (29%) followed by the

age group of 21-30 years (23%). In the study by Hall *et al.* females comprised 84% of the total cases and the age range was 13-92 yrs [6]. Mandekar *et al.* reported a male female ratio of 1:6.1 in their study of 238 cases of various thyroid lesions [7]. Male female ratio in the study conducted by sirpal y on 1123 cases was 1:1.4 with the highest number of cases seen in the 4th decade of life [8]. Maximum number of cases were seen in the 4th decade of life as observed by Sirpal y [8]. The total number of benign lesions were 224 (56%) and malignant were 176 (44%). The ratio of malignant to benign lesions being 1:1.27. In a study conducted by Mitra *et al.* observed malignant to benign ratio of 1:6.69 [9]. In the present study out of 224 benign lesions of thyroid, colloid goitre was the most common lesion (55.8%) followed by follicular adenoma (26.8%). Among the malignant lesions papillary carcinoma was the most common (78.4%) followed by follicular carcinoma (10.8%). Naggada H.A *et al* observed that the most common benign lesion in thyroid was nodular goitre followed by follicular adenoma [10]. Fernandes H *et al.* observed that the commonest lesion encountered in thyroid gland was nodular goitre. And among the malignant neoplasms papillary carcinoma was the most common lesion noted [11]. M Salih Deveci *et al.* reported their experience with 339 cases, the risk of malignancy was higher in patients younger than 40 years than in patients 40 years or more (53% Vs 30%) and was greater in males than in females (41% Vs 33%) [12].

Conclusion

Thyroid disease is common in 4th decade of life. The male female ratio in thyroid lesions is 1:4.4. Benign lesions are more common in 4th decade of life and malignancy is common in younger age group (3rd decade). Colloid goitre is the most common benign lesion of thyroid and papillary carcinoma is the most common malignancy.

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