Original Research Article

Clinicopathological spectrum of operated thyroid lesions in a tertiary care centre : a cross sectional study

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Abstract

Background: Thyroid diseases are one of the most common endocrine disorders affecting the general population worldwide.They comprise a spectrum of entities causing systemic disease (Grave's disease) or a localised abnormality in the thyroid gland such as nodular enlargement (goitre) or a tumour mass.The prevalence and pattern of these disorders depend on various factors including sex, age, ethnic and geographical patterns.**Aim:** To study the clinicopathological spectrum of thyroid lesions and the treatment outcome among the operated cases of thyroid. Variables in the spectrum includes age and sex distribution, mode of presentation, pre-operative thyroid function, evaluation by ultrasound, FNAC and final histopathology, postoperative complications and duration of hospital stay.**Materials and Methods:**This was a cross sectional study which included all patients who underwent surgery for thyroid pathologies in the department of general surgery, at our teaching hospital from January 2016 to December 2017.150 patients were included in the study. Patients who underwent thyroid surgery but whose records were not complete for thyroid function tests, USG findings and FNA findings were excluded from the study. **Results:**The highest incidences (38.6%) of thyroid lesionswere found in age group of 46-60 years with female predominance (87.3%). Out of total 150 cases, 30 were malignant and 120 were benign lesions. Thyroid function test was carried out for all cases and out of them 84 were euthyroid. Most common clinical symptom was swelling in the neck which was present in all cases. Multinodular goitre was the most common radiological finding seen in 76.7% cases. Benign follicular nodule was the most common diagnosis in FNAC (80%).The most common surgery performed was Total thyroidectomy (71%).Papillary carcinoma was the most common malignant lesion in this study (29 cases) and it was associated with MNG in 55% of cases. The incidence of clinical hypocalcemia was 10.6% and RLN injury was 5%.The mean duration of hospital stay was 4 days.**Conclusions:** Multinodulargoitre was found to be the most common thyroid lesion in this study. Thyroid diseases showed definite female predominance, with most of them occurring in an age group of 36 - 60 years. Papillary carcinoma was the most common malignant lesion in this study.In our study USG neck showed a moderate agreement with final histopathology compared to FNAC in diagnosing malignant lesions preoperatively. USG guided FNAC may improve the diagnostic accuracy. Combined approach based on history, clinical examination, FNAC and ultrasound is required to make an accurate diagnosis.

Keywords: Thyroid swelling, Multi nodular goitre, Papillary carcinoma, Thyroidectomy.

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Introduction

Thyroid lesions are fairly common worldwide and are commonly encountered in clinical practice [1]. The problem in clinical practice is to distinguish reliably the few malignant tumors from the many harmless nodules so that a definitive preoperative tissue diagnosis of the malignancy allows planning of appropriate surgery and relevant patient counselling. The prevalence of thyroid swelling ranges from 4% to 10% in the general adult population and from 0.2% to 1.2% in children [2]. They constitute only 0.7% of all cancers in female and 0.2% in males. The majority of clinically diagnosed thyroid swelling are non-neoplastic; only 5% to 30% are malignant and require surgical intervention [3]. Thyroid lesions may be developmental, inflammatory, hyper plastic and neoplastic [4]. In India the incidence of thyroid cancer is on the rise. The Indian Council of Medical Research established the National Cancer Registry Program (NCRP) which has collected the data of more than 3, 00,000 cancer patients between the periods 1984 and 1993. Six centres involved in this study were at Mumbai, Delhi, Thiruvananthapuram, Dibrugarh, Chandigarh, and Chennai.Among them, Thiruvananthapuram had the highest relative frequency of cases of thyroid cancer among all cancer cases enrolled in the hospital registry [5]. In Kerala, the incidence of thyroid diseases, especially thyroid cancer is on the rise. There are some studies linking thyroid malignancies to background radiation in southern Kerala [6]. This necessitates proper guidelines for management of the disease. Preoperative Ultrasonography (USG) with special mention of TIRADS scoring and FNAC is essential to identify thyroid lesions that are malignant.India being a developed country, there is a lack of resource in health sector and lack of health awareness. The presentation is diverse. The clinical evaluation of the patient in such scenario is of utmost importance. Accurate diagnosis of thyroid nodule is necessary for appropriate clinical management of patients and to avoid unnecessary surgical interventions. Current study evaluates the clinicopathological spectrum of operated thyroid lesions and the treatment outcome in a tertiary care centre, conducted over a period of 24 months.

Materials and methods

150 patients who had thyroid surgery in our department from January 2016 to December 2017 were included.In this cross sectional study we aimed to study the age and sex distribution along with the mode of presentation of the thyroid lesions,pre-operative thyroid function, evaluation by ultrasound, FNAC and final histopathology, postoperative complications and duration of hospital stay. A comparison of preoperative FNAC, ultrasound of thyroid and final histopathology was also done. Incidence of malignancy was also studied. Evaluation of post-operative complications were done namely incidence of RLN injury, evaluation of biochemical and clinical hypocalcemia. Patients who underwent surgery but where the records were incomplete were excluded from the study.

SPSS version 18 was employed for statistical analysis. The Chi-square test was employed for testing statistical significance of association between two discrete variables (P = 0.05).

Results

Table 1: Age wise distribution of thyroid cases

Age group(years)	Number of cases	Percentage (%)
<25	3	2.0
25-35	18	12.0
36- 45	48	32.0
46-60	58	38.7
>60	23	15.3
Total	150	100.0

Table 2: Sex wise distribution of thyroid cases

Gender	Number of cases	Percentage (%)
Female	131	87.3
Male	19	12.7
Total	150	100.0

Table 3: Thyroid function (preoperative)

Thyroid function	Number of cases	Percentage (%)
Euthyroid	84	56.0
Hyperthyroid	26	17.3
Hypothyroid	40	26.7
Total	150	100.0

Table 4: USG Diagnosis

USG	Number of cases	Percentage (%)
MNG	115	76.7
MNG with Thyroiditis	16	10.6
STN	9	6.0
Suspicious for malignancy	9	6.0
MNG + thyroglossal cyst	1	0.6
Total	150	100.0

MNG-multi nodular goitre; STN- solitary thyroid nodule

Table 5: FNAC diagnosis

FNAC	Number of cases	Percentage (%)
AUS	4	2.7
Benign Follicular Nodule	120	80.0
Benign follicular nodule with thyroiditis	14	9.3
Follicular Neoplasm	2	1.3
Papillary Carcinoma	10	6.7
Total	**150**	**100.0**

AUS- atypia of unknown significance

Table 6: Surgical Procedure

Procedure	N	%
Total Thyroidectomy	**107**	**71**
Hemi Thyroidectomy	**18**	**12**
Near Total Thyroidectomy	**20**	**13**
Sub Total Thyroidectomy	**2**	**1.9**
Total Thyroidectomy + Functional lymphnode dissection	**1**	**0.7**
Total Thyroidectomy + Thyroglossal cyst excision	**1**	**0.7**
Total thyroidectomy with median sternotomy	**1**	**0.7**

Table 7: Histological diagnosis

HPE	Number of cases	Percentage (%)
Benign nodular Colloid Goitre	78	52
Nodular Colloid Goitre with thyroiditis	38	25
Papillary Carcinoma	29	19.3
Hurthle cell carcinoma	1	0.7
Follicular Adenoma	4	3
Total	150	100

Table 8: Comparison of FNAC diagnosis with Histopathological diagnosis

		Histopathological diagnosis				
FNAC	**Follicular Adenoma**	**Nodular colloid Goitre with thyroiditis**	**Benign nodular colloid Goitre**	**Papillary carcinoma**	**Hurthle cell carcinoma**	**Total**
AUS	2	0	0	2	0	**4**
Benign	0	38	78	16	0	**134**
Follicular	0	0	0	1	1	**2**

Neoplasm						
Malignancy	0	0	0	10	0	**10**
				Total		**150**

Table 9: Variants of Papillary carcinoma

Variant	Number	%
Follicular	10	34.4
Oncocytic	4	13.7
Microcarcinoma	8	27.5
Classical	2	6.8
Unavailable	**5**	17.2
Total	**29**	100

Table 10: Comparison of USG diagnosis with histopathological diagnosis

	Histopathological diagnosis					
USG diagnosis	**Follicular Adenoma**	**Nodular Colloid Goitre with thyroiditis**	**Benign nodular colloid goitre**	**Papillary carcinoma**	**Hurthle cell carcinoma**	**Total**
MNG	3	31	65	16	0	115
MNG with Thyoriditis	0	3	7	7	0	17
STN	0	3	5	1	0	9
Suspicious for malignancy	1	1	1	5	1	9
Total						**150**

Table 11: Association of Biochemical hypocalcemia with Clinical hypocalcemia

	Clinical hypocalcemia		Total
Biochemical hypocalcemia	**Yes**	**No**	
Yes	**16 (21)**	**61 (79)**	**77(100)**
No	**0**	**73 (100)**	**73 (100)**

Table 12: Age wise distribution of thyroid lesions

Age group (yrs)	Follicular Adenoma	Nodular Colloid Goitre with thyroiditis	Nodular Colloid Goitre	Papillary carcinoma	Hurthle cell carcinoma	Total
<25	0	1	2	0	0	3
25-35	0	4	10	4	0	18
36- 45	2	13	21	12	0	48
46-60	2	15	32	8	1	58
>60	0	5	13	5	0	23

Females were found to be more affected by thyroid diseases (87.3%) in our study (Table 1). Most common age group affected by thyroid diseases was 46-60 years (38.7%) followed by 36 to 45 years (32%) (Table 2). Nonneoplastic diseases were more common than neoplastic ones in all age groups with multinodular goitre being the most common presentation among the 150 cases (87.3%). Papillary carcinoma was most commonly found in 36-45 years group.

Neck swelling was the chief complaint in all patients and a few had symptoms of toxicity and some presented with hypothyroid symptoms as well. Thyroid profile was assessed in all patients and 40 was found to be hypothyroid, 26 hyperthyroid and 84 was found to be in euthyroidstatus(Table 3).

The most common thyroid disease diagnosed sonologically was multinodular goitre (76.7%).Thyroiditis was diagnosed sonologically in 10.6% of patients (Table 4).Benign follicular nodule was the most common diagnosis in FNAC (80%).Papillary carcinoma was the most common malignant lesion identified by FNAC (6.7%).2.7% of patients were found to have AUS (atypia of unknown significance)in FNAC (Table 5).

The most common surgery performed was Total thyroidectomy (71%) followed by Near total thyroidectomy (13%).(Table 6).

On histopathological examination of the specimens, papillary carcinoma was the most common malignancy seen (29 cases). Hurthle cell carcinoma was seen in 1 specimen. Most of the specimens (52%) showed benign nodular colloid goitre and associated thyroiditis in another 25% (Table 7).

On comparing FNAC with final histological diagnosis, FNAC could identify 10 cases of malignancy out of 30 malignant cases in final histology. Two cases were reported as follicular neoplasm which turned out to be Hurthle cell carcinoma and papillary carcinoma in final histology.(Table 8).

Out of 29 cases of Papillary carcinoma, follicular variant (34.4%) was the most common histological subtype seen (Table 9).

On comparing USG diagnosis with final histology, 9 cases were reported as 'suspicious for malignancy' out of which 6 turned out to be malignant in final histology (Table 10).

Biochemical hypocalcaemia was seen in 77 patients postoperatively but only 16 patients (10.6%) developed clinical hypocalcaemia. The association was statistically significant. (P value <0.05)(Table 11).

The incidence of recurrent laryngeal nerve (RLN) injury was 5% among the 150 operated cases.The mean duration of hospital stay was 4 days.

Discussion

Thyroid lesions are one of the most common endocrine problems and usually present with enlargement of the thyroid gland or sometimes pain.According to WHO, 7% of the world population is suffering from clinically apparent goitre. Majority of these patients are from developing countries where the disease is attributed to iodine deficiency [7].Thyroid enlargement may be in the form of multinodular, solitary or diffuse goitre. Thyroid diseases are generally more prevalent in females [8].Thyroid diseases are very common in the community. They are among the commonest elective surgeries done by general surgeons. Despite this there is not much literature from India on the patterns of presentation, treatment modalities and outcomes of thyroid disorders. The recent interest in endoscopic thyroidectomy is again bringing the surgical treatment of thyroid diseases into the limelight. We present statistics on patients who underwent surgery for thyroid diseases in our hospital.

We took out data on patients who underwent thyroid surgery in our hospital from January 2016 to December 2017. All patients who underwent surgery for thyroid disease, both benign and malignant were included. Majority of the patients were admitted for four or five days. However, during the period of study, the hospital was also catering to government provided insurance patients. Under this scheme, the package days for a thyroidectomy surgery was five days and patients had to be admitted for five days after surgery even if they were fit for discharge the next day.

All patients were evaluated preoperatively by thyroid function tests, ultrasound of neck and FNAC of the thyroid nodules, apart from the routine preoperative workup. Clinical diagnosis and USG diagnosis were correlating in almost all benign cases and in a few malignant cases who presented with a hard nodule and in one case who had clinically enlarged level III nodes. Benign follicular nodule was the most common FNAC diagnosis.Out of 4 patients with atypia on FNAC, two were benign and two had malignancy on thyroidectomy. None of the patients had USG guided FNAC. However with increasing incidence of smaller nodules being picked up on routine USG, it may be possible to better the yield of FNAC if done under USG guidance Indications for surgery in benign goitre in our group were large size, cosmetic reasons, patient apprehension about malignancy and pressure effects. TIRADS scoring was not a routine feature of USG reporting in our institution during the period under study. The most common surgery performed was Total thyroidectomy (107). All patients had pre-operative video laryngoscopy for vocal cord assessment. The operating time varied from 90 minutes to 150 minutes. The blood loss was minimal and no patient required transfusion during or after surgery. All cases were closed with a suction drain, which was removed on the day after surgery. Only in around 10 patients, the drain was maintained for more than a day. Only one patient required re-exploration in the immediate postoperative period. This patient was found to have around 200 ml of blood in the drain within an hour of extubation and

was reexplored. The bleeding was found to be from the pretracheal vessels. The method of control of the vascular pedicles was by ligation using absorbable (polyglactin) or non-absorbable (silk) sutures, by use of bipolar diathermy or Ligasure (Covidien). The method of vascular control did not have any correlation with the amount or nature of drain fluid on the day after surgery. Thyroglossal cyst excision was done in one patient along with total thyroidectomy and one patient required functional neck dissection in view of enlarged lateral neck nodes associated with papillary carcinoma. Median sternotomy was done for a case with retrosternal extension.

77 of the patients had biochemical hypocalcemia when checked on the day after surgery. Serum Calcium was checked at 24hours and 48hours.16 patients(10.6%) had clinical symptoms of hypocalcemia ranging from circumoral numbness to tingling and numbness of the hands and feet. Clinical hypocalcemia was seen in patients who underwent total thyroidectomy. There was variation in the pattern of use of calcium supplements after surgery in patients with biochemical hypocalcemia without any clinical symptoms. Most of the patients received oral calcium supplements for a period ranging from 10 to 14 days and could be weaned off the same without any adverse problems. 4(2.6%) of these 150 patients had persistent hypocalcemia requiring calcium supplementation with activated vitamin D even one year after surgery. These patients are likely to be permanently hypocalcemic. However, biopsy reports of the thyroid specimen of these patients did not comment on the presence of parathyroid tissue along with the thyroid tissue. In a few patients where the histopathology report mentioned the presence of parathyroid tissue, it was limited to only one gland. Serum levels of calcium, phosphorus and albumin were checked in the postoperative visit to OPD. Hypocalcaemia is a common complication after thyroid surgery. It usually occurs in first days after surgery and it can be symptomatic or asymptomatic. The frequency of transient hypoparathyroidism after thyroid surgery is between 6.9 and 49%[9,10,11].Few observational studies had noted up to 50% of transient and 4% permanent hypocalcaemia after thyroidectomy[12]. Inferior parathyroid glands are at risk of inadvertent removal or vascular damage during clearance of para-tracheal and pre-tracheal nodes in the central neck[13]. American Thyroid Association had revised the recommendation for central compartment dissection and suggested prophylactic dissection in selected cases only[14].In our group,the incidence of transient hypoparathyroidism was 8% and persistent hypoparathyroidism was 2.6% which was comparable with other studies.Postoperative recurrent laryngeal nerve (RLN) injuries can be transient or permanent. Permanent RLN injuries are documented in 0.5% to 5% of the patients, whereas transient injuries are observed between 1% and 30% according to various studies. [15,16] Transient injuriesusually recovers between 4 and 6 weeks to complete recovery. Nonfunctions or dysfunctions lasting more than 1 year are considered permanent.Recurrent laryngeal nerve was identified in all our cases during the procedure. In our study,the incidence of RLN injury was 5%,which was transient and all patients recovered in 4 weeks' time. Patients with recurrent laryngeal nerve injury had voice change after surgery and RLN injury was confirmed by post-operative video laryngoscopy. All patients had unilateral injury. There was no patient with bilateral injury during the study period. No patient presented with stridor because of RLN injury during the study period. One patient had superior laryngeal nerve injury (aspiration symptoms) in addition to RLN injury.

There were 30 cases of malignancy among the study group. Papillary carcinoma was the commonest differentiated tumour(19.3%). There was one patient with Hurthle cell carcinoma. Follicular variant was seen in 10 patients, oncocytic in 4, classical in 2 and microcarcinoma in 8 patients. In the remaining patients, the variant of papillary carcinoma could not be identified due to inadequate record keeping.15 patients with papillary carcinoma had undergone radioactive iodine ablation postoperatively.Papillary thyroid carcinoma (PTC) is the most common type of malignant thyroid tumour constituting more than 70% of thyroid malignancies [17]. There has been an increasing incidence of PTC worldwide for the past few decades. In our study, PTC was found in both MNG and STN specimens.Previous studies showed association between multi nodular goitre and papillary thyroid carcinoma [18] and our study showed a similar percentage of association(55%) between them.Where FNAC did not pick up malignancy and the final histopathology showed papillary carcinoma, the lesions were usually small and low grade and treatment did not alter. One patient developed DVT in the postoperative period, on evaluation was found to have protein S deficiency.

Conclusion

Multinodular goitre was found to be the most common thyroid lesion in this study. Thyroid diseases showed

definite female predominance, with most of them occurring in an age group of 36- 60 years.The most common presentation was swelling of the gland which may be associated with discomfort.Though FNAC is very useful in diagnosis and management of multinodular goitre, it is not a good modality for diagnosing malignancy in MNG. Malignancy can still come as a surprise on postoperative histopathological examination. In our study USG neck showed a moderate agreement with final histopathology compared to FNAC in diagnosing malignant lesions preoperatively. USG guided FNAC may improve the diagnostic accuracy. Papillary carcinoma was the most common malignant lesion in this study(19.3%) with follicular variant as the most common subtype followed by papillary micro carcinoma.The most common associated lesion with papillary carcinoma was multinodulargoitre(55%)in this study, hence this study emphasises the need for periodic evaluation in middle aged female patients with multinodular goitre for early detection of malignancy.Combined opinion on the nature of a thyroid nodule should be done based on history, clinical examination, ultrasound features and FNAC.

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