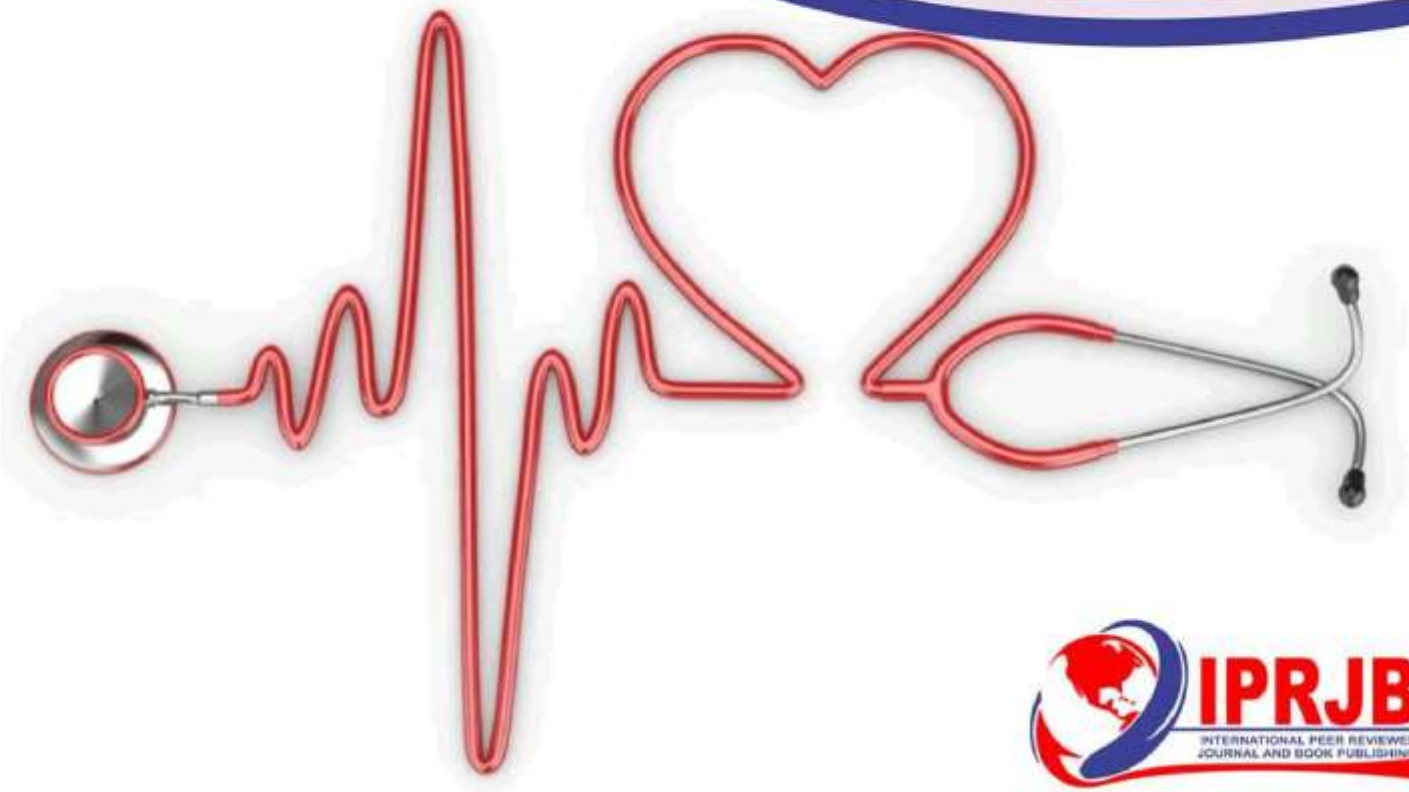
Journal of
Health, Medicine and Nursing
(JHMN)

Detection of Thyroid Malignancy among Thyroid Swellings in Zagazig University Hospitals

Osama AbdElrahman Khalel, Awny Ali Elzeftawy, AbdElhafez M. Elsheweal and Mohammad Abdullah Zaitoon



IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING

Journal of Health, Medicine and Nursing
ISSN 2520-4025 (Online)
Vol. 1 Issue 2 No. 3, pp 27- 43

www.iprjb.org

Detection of Thyroid Malignancy among Thyroid Swellings in Zagazig University Hospitals

[1]Osama AbdElrahman Khalel, [2]Awny Ali Elzeftawy, [3]AbdElhafez M. Elsheweal [4]Mohammad Abdullah Zaitoon.

1 ,2,3, 4

Department Of General Surgery, Zagazig University Hospitals, faculty of medicine, Zagazig, Egypt.

Corresponding author: abdelhafezelshewail@yahoo.com

ABSTRACT

Purpose: Clinically, Thyroid nodules (TNs) are rather a common disease occurs in 4-7% of the adult population based on palpation and of 20-76%, based on ultrasound examination. The main risk of such nodules is the possibility of malignancy. The routine management of these nodules was surgical excision to allow a final tissue diagnosis. Wide spectrum of procedures were used to manage such cases and in some instances completion thyroidectomy may be needed if malignancy was discovered in histopathology what means more morbidity to the patients, as thyroid surgery even with the best hands is attended with considerable morbidity. On the other hand the incidence of tissue diagnosed cancer in these nodules ranged from 12-20 %. It is therefore logic to propose a more selective policy for patients with thyroid nodules who must be subjected to surgery. It was to detect frequency of thyroid malignancy among patients with thyroid nodules scheduled for surgery and to evaluate the accuracy of the preoperative diagnostic tools in diagnosing malignancy in relation to the gold standard investigation i.e. postoperative histopathology.

Methods: One hundred patients with thyroid nodules were enrolled in this study from Jul. 2013 to Jun. 2015, they included 30 (30%) males and 70 (70%) female with mean age of 40.77±14.9. Complete diagnostic evaluations were carried out for all patients but sonar guided FNAC was done only for 80 patients and the remaining 20 patients refused it. The suitable thyroid surgery was carried out after making the preoperative diagnosis. All operative specimens were sent for histopathological examination which was then compared to the preoperative diagnosis. All cases were operated upon in General Surgery department, Faculty of medicine, Zagazig University Hospitals, Zagazig, Egypt.

Statistical analysis: SPSS version 20.

Results: In total number of 100 patients with thyroid swellings who passed thyroid surgery, it was found that the highest frequency of thyroid swellings occurred in the age group (31– 40 years) (32%) while the lowest one occurred in the age group under 20 years (1%). Histologically, thirty nine cases (39%) were found to be malignant and the remaining 61 cases (61%) were non- malignant thyroid swellings and the most frequent form of malignancy was Papillary carcinoma 31 patients (79.47%) followed by follicular carcinoma 4 patients (10.25%) and the most frequent benign lesion was colloid nodules in 33 patients (54.09%). The sensitivity of US was (87%) and its specificity was (3.3%) and its accuracy was (36.0%) while the sensitivity of FNAC was (96.5%) and specificity (76.4%) and its accuracy was (83.7%).

Conclusion: There is a quite high incidence of malignancy in patients suffering from thyroid nodules. Ultrasound has an important role in evaluating thyroid nodules but more crucial if used as a guide to FNAC. FNAC especially if sonar guided is a good and trustful tool in diagnosing thyroid malignancy

as it proved to be safe, easy, highly sensitive and accurate. So, all thyroid swellings should be carefully examined and thoroughly investigated for malignancy considering FNAC.

Key wards: *Thyroid nodules, Ultrasound, Ultrasound guided FNAC and Thyroid malignancy.*

INTRODUCTION

Thyroid nodules are a worldwide problem occurs in 4-7% of the adult population based on palpation and of 20-76%, based on ultrasound examination, the causes of these nodules may be familial, inflammatory, neoplastic or dietary, but the commonest cause is dietary iodine deficiency. The usual forms are benign forms of cell overgrowth or degeneration. Thyroid gland can also enlarge due to mild inflammation, occasionally produced by viruses e.g. subacute thyroiditis. People may inherit the tendency to goitre from earlier generations[(1)]. Cysts and benign neoplasms are often responsible for a single thyroid lump but malignant neoplasms may be responsible also in a considerable proportion and the incidence of malignancy in goitrous thyroid is about 10% and usually presents with a palpable swelling in the neck[(2)]. Thyroid cancer accounts for less than 1% of all malignancies and it is the most common among all endocrine malignancies with an apparent increasing incidence in a wide spectrum of clinical, behavioral and therapeutic responsiveness[(2,3)]**.** So, the main risk of thyroid nodules is the possibility of malignancy and at the same time there were no definite tool to diagnose this malignancy except surgical excision which was the routine management to allow a final tissue diagnosis through different forms of thyroid surgeries which may be insufficient in some instances and completion thyroidectomy may be needed if malignancy was discovered in post-operative histopathology what means more morbidity to the patients, as thyroid surgery even with the experienced hands is attended with considerable morbidity (bleeding, recurrent laryngeal, superior laryngeal nerves injuries and hypoparathyroidism). However the incidence of cancer discovered in these nodules ranged from 12-20%. Therefore it is logical to propose a more selective policy for patient with thyroid nodules who will be subjected to surgical interference. Fine-Needle Aspiration Cytology (FNAC) is considered to be the "gold standard" in the selection of patients for surgery [(4,5,6)]**.**

Aim of the Work

This cross sectional prospective study from outpatient clinics was performed to detect thyroid malignancy among patients with thyroid nodules admitted for thyroidectomy, and to evaluate the accuracy of the preoperative diagnostic tools specially FNAC in diagnosing malignancy in relation to the gold standard investigation i.e. histopathology.

PATIENTS AND METHODS

After approval of the ethical board of Zagazig University Hospitals and after obtaining a full informed written consent from each patient a total number of 100 patients with thyroid nodules admitted in department of general surgery, from Jul. 2013 to Jun. 2015, were enrolled in this study.
All patients were subjected to:

I- Preoperative evaluation:

1- Full and detailed history taking including history of exposure to irradiation and family history.
2- Full and detailed clinical examination.
3- Laboratory investigations:

- Preoperative thyroid function tests (TFTs): T4, T3, TSH serum Calcitonin and thyroid antibodies.
- Routine preoperative investigations.

4- Imaging studies:

- Neck and thyroid ultrasound examination for all cases. The results of US were expressed as being (+ve) if suspiciously malignant lesions were suspected or as (-ve) if benign lesions were present.
- Sonar guided fine needle aspiration cytology (FNAC) from thyroid gland and enlarged lymph nodes (if found) were done for patients who accepted that and not for those who refused it. The results of thyroid FNAC were expressed as malignant (+ve), benign (-ve) or suspicious follicular lesion according to The Bethesda System for Reporting Thyroid Cytology[7]. Those of lymph nodes were expressed as malignant (+ve) or benign (- ve).
- Chest x-ray for all patients.
- CT scan neck was done for patients with huge thyroid swellings. The results of CT were expressed as being malignant (+ve) or benign (- ve).

II- Type of surgical intervention:

Type of surgery was chosen after reviewing all investigations of each patients and these included; hemithyroidectomy, sub-total and total thyroidectomy either alone or with selective or modified neck dissection.

III- Histopathology:

All operative specimens were evaluated by histopathological examination. Specimens were processed in automated tissue processing units and stained with routine haematoxylin and eosin.

IV- Postoperative care and follow up:

For early and late complications, Follow up was done both clinically and ultrasonographically for at least six months postoperatively.

Statistical Analysis:

Standard methods using SPSS version 20 for windows were used, Student t-test, Chi-square were used in appropriate situation. P. value ≤0.05 was considered the level of significance.

RESULTS

One hundred patients with thyroid nodules were enrolled in this study, they included 30 (30%) males and 70 (70%) females with mean age of 40.77±14.9 years; Table (1) shows sociodemographic data and past history of our patients. Most of our patients presented to surgery outpatient clinic with thyroid swelling and many were directed to us from other clinics. Twenty three of them had palpable cervical lymph node, 70 had dysphagia, 76 had dyspnea, 3 had pain referred to ear and 2 patients complained of hoarseness of voice (Table 2).

Table (1): Sociodemographic data

Age	Range	**14 -70 (years)**

	Mean age ± SD	40.77 ± 14.9 (years)
Sex:	Females Males	70 (70%) 30 (30%)
Work:	Yes NO	30 (30%) 70 (70%)
Smoking:	Yes No	14 (14%) all are males 86 (86%)
Past history of head & neck irradiation		in 10 males (10%)

Table 2: Clinical presentations of our patients

Presentation		**No.**	**%**
Thyroid swelling	Yes	**100**	**100%**
Dysphagia	Yes	**70**	**70%**
	No	**30**	**30%**
Dyspnea	Yes	**76**	**76%**
	No	**24**	**24%**
Ear pain	Yes	**3**	**3%**
	No	**97**	**97%**
Hoarseness of voice	Yes	**2**	**2%**
	No	**98**	**98%**
Lymph node enlargement	Yes	**23**	**23%**
	No	**77**	**77%**

Journal of Health, Medicine and Nursing
ISSN 2520-4025 (Online)
Vol. 1 Issue 2 No. 3, pp 27- 43

www.iprjb.org

Clinical and ultrasonic examinations of the thyroid were done to detect and describe the nodules regarding its side, number, character, size and fixity of the thyroid to the surrounding structures and presence of enlarged lymph nodes (Tables 3,4).

Table (3) : Clinical and ultrasonic thyroid examinations

Findings	Character	No.	%
Nodule	Single	41	41%
	Multiple	37	37%
	Diffuse	22	22%
Side	Both	52	52%
	Left	20	20%
	Right	28	28%
LN enlargement	-ve	66	66%
	+ve	34	34%
Attachment to surroundings	No	90	90%
	Yes	10	10%

Table (4) : Ultrasonic characters and sizes of nodules

US character	No.	%
Solid hypoechoic	60	60%
Heterogeneous cystic	19	19%
Homogenous cystic	21	21%
Size (cm^2)	Mean± SD	12.87±9.3

	Range	2.16-58.0

Ultrasound examination showed benign thyroid lesions in 7 patients (7%) and suspicious lesions in 93 patients (93%), 34 patients of them had enlarged cervical lymph nodes. Most of these suspicious lesions were solid or heterogeneous cystic nodules (Tables 4, 5).

Eighty patients (80/100) accepted thyroid FNAC including 27 of the 34 patients (79.4%) with lymph node enlargement; FNAC from their LN was done also. The remaining 20 patients (20%) refused FNAC including the remaining 7 patients with LN enlargement 7/34 (20.6%).

The results of thyroid FNAC were as follows (Table 5).

- 40/80 patients had malignant thyroid FNAC smears.
- 9/80 patients had suspicious follicular lesion FNAC smears.
- 31/80 patients had benign thyroid FNAC.
- Regarding results of lymph node FNAC; 24/27 (88.9%) of them have malignant FNAC smears while the other 3/27 (11.1%) it was benign table (5).

CT neck was done to 63 patients (63%) with huge thyroid swellings. It was suspiciously malignant in 56/63 patients (88.9%) and benign in 7/63 patients (11.1%) (Table 5).

Table (5) : Preoperative diagnosis made by different tools

Diagnostic tool & its result		**No.**		**%**
US	B	7		7.0%
	SM	93		93.0%
CT	NOT DONE 37/100	37		37.0%
	DONE 63/100(63%)	B	7/63	11.1%
		SM	56/63	88.9%
LN FNAC	NOT DONE	7/34		20.6%
	DONE 27/34 (79.4%)	B	3/27	11.1%
		M	24/27	88.9%

Thyroid FNAC	NOT DONE 20/100	20		20.0%
	DONE 80/100 (80%)	(SF)	9/80	11.25%
		B	31/80	38.75%
		M	40/80	50.0%

B = Benign, SM = suspicious malignant, M = malignant and SF= suspicious follicular.

Table (6) : Thyroid hormones distribution among studied group

	TSH (µu/ml)	T3 (pmol/l)	T4 (pmol/l)
Mean ± SD	1.75±1.7	21.22±41.24	5.85±5.07
Range	0.4-7.12	1.20-48.1	1.0-15.3

Surgical procedures were tailored according to every patient own preoperative diagnosis and for some patients completion thyroidectomy was done after availability of histopathology (Table 7).

Table (7) : Surgical procedures

Procedure	**No.**	**%**
Hemithyroidectomy	**2**	**2%**
Subtotal thyroidectomy	**28**	**28%**
Total thyroidectomy + Modified neck dissection	**9**	**9%**

Total thyroidectomy		**36**	**36%**
Total thyroidectomy + Selective neck dissection		**25**	**25%**
Completion Thyroidectomy after	Hemithyroidectomy	**1**	
	Subtotal thyroidectomy	**9**	

Postoperative care: Most patients were discharged home on the second or third postoperative day, after evaluation of serum calcium and vocal cord mobility and removal of the drain, on Eltroxine oral tablets and oral analgesics. Those patients with postoperative complications remained admitted in hospital for care according to type of complication as will be mentioned soon. Complications had occurred in 10 patients; in 60% of them after completion thyroidectomy: 6 patients suffered transient postoperative tetany (4 of them after completion thyroidectomy and 2 after total thyroidectomy) all of them improved 1-2 months. One patient suffered combined esophageal and bilateral vocal cord injuries after completion thyroidectomy which mandated tracheostomy and feeding gastrostomy but died after severe sepsis in ICU. Two patients suffered unilateral vocal cord injury and were acclimatized to live with hoarseness of voice. One patient suffered bilateral vocal cord paralysis after completion thyroidectomy and tracheostomy was done for her but consequent severe chest infection occurred and died later on from sepsis. The mortality rate in our study was 3%, one after complicated combined esophageal and bilateral vocal cord injuries, one from bilateral vocal cord paralysis and tracheostomy with consequent severe chest infection and the last one did not recover from anesthesia. The histopathologic results table (8) showed: 39 patients with malignant thyroid nodules with the more frequent form is the papillary carcinoma in 31 patients most of them in the 4^{th} decade of life, followed by metastatic follicular carcinoma in 4 patients most of them in the 4^{th} decade of life. Anaplastic carcinoma found in 2 patients in 7^{th} decade of life and medullary carcinoma in 2 patients. These results showed clear predominance of papillary carcinoma over follicular and anaplastic carcinoma and its more common frequency in males (18) (58%) (Table 9).

Nonmalignant cases were 61 patients. The commonest was colloid nodule which was found in 33 patients followed by the follicular adenoma in 14 patients, then hyperplasia in 8 patients and the least was thyroiditis in 6 patients (Table 8).

Table (8) : Postoperative histopathological diagnosises

Histopathological diagnosis	**Frequency**	***%***
Colloid nodule	33	33.0%
Papillary carcinoma	31	31.0%
Metastatic Follicular carcinoma	4	4.0%
Medullary carcinoma	2	2.0%

Anaplastic carcinoma	2	2.0%
Follicular adenoma	14	14.0%
Hashimoto thyroiditis	2	2.0%
Reidel's thyroiditis	4	4.0%
Follicular hyperplasia	8	8.0%

On comparing the preoperative diagnosis by different tools to that of histopathology (the gold standard investigation) we found that (Table 12); thyroid ultrasound examination showed benign lesions (-ve) in 7 patients and histopathology confirmed this in only 2 patients (true –ve) and the other 5 were malignant (false –ve). US showed also suspicious malignant swellings in 93 patients and histopathology confirmed malignancy in only 34 patients (true +ve) while the remaining 59 were benign (false +ve).

Thyroid FNAC showed (benign) (-ve) in 31 patients out of 80 patients and this has been confirmed by histopathology (true –ve), 40/80 patients have been reported as (malignant FNAC) and this has been confirmed by histopathology in 39 (true +ve) and one (false +ve). And 9/80 patients were suspicious (cellular follicular lesion) which proved to be benign (-ve) by histopathology.

Lymph node FNAC was done to 27 patients where 24 patients were positive for malignancy; confirmed by histopathology in 19 patients only (true +ve) and the other 5 cases were benign (false +ve) while the remaining 3 patients were negative and also confirmed by histopathology (true –ve). CT scan neck was done to 63 patients. It was suspicious malignant in 56/63 patients but histopathology confirmed this in only 34 patients (true +ve) and the other 22 were benign (false +ve). Also CT showed benign lesions in 7/63 patients and histopathology confirmed this in 4 patients (true–ve) only and the other 3 patients were malignant (false–ve) (Table 12).

Table (9): Association between malignancy and socio-demographic data

Socio-demographic data and history of irradiation			**Histopathology**		**Total**	**X 2**	**P**
			Benign	**Malignant**			
Sex	Female	No.	52	18	70	19.4	0.00**
		%	85.2%	46.2%	70.0%		
	Male	No.	9	21	30		
		%	14.8%	53.8%	30.0%		

Age	Mean	38.9180 (in 61 patients)		43.66 67 (in 39 pat ients)		T 1.560	.122
	SD	10.97770		19.456 20			
history of irradiation	No						
	Yes						
Special habit (smoking)	No	No.	60	26	86	19.8	0.00**
		%	98.4%	66.7%	86.0%		
	Yes	No.	1	13	14		
		%	1.6%	33.3%	14.0%		

**** Means high significanc**

Table (10): Association between clinical presentation and malignancy

Presentation			**Histopathology**		**Total**	**X_2**	**P**
			Benign	**Malignant**			
Dysphagia	**No**	No.	30	0	30	27.4	0.00**
		%	49.2%	0.0%	30.0%		
	Yes	No.	31	39	70		

		%	50.8%	100.0%	70.0%		
Dyspnea	**No**	No.	24	0	24	20.1	0.00**
		%	39.3%	0.0%	24.0%		
	Yes	No.	37	39	76		
		%	60.7%	100.0%	76.0%		
Total		No.	61	39	100		
		%	100.0%	100.0%	100.0%		

**** High significance**

Table (11): Association between swelling characters and malignancy

Characters			**Histopathology**		**Total**	**X_2**	**P**
			Benign	**Malignant**			
Nodule	**Single isolated**	No.	24	17	41	10.4	0.005*
		%	39.3%	43.6%	41.0%		
	Diffuse	No.	8	14	22		
		%	13.1%	35.9%	22.0%		
	Multiple	No.	29	8	37		
		%	47.5%	20.5%	37.0%		
LN	**No**	No.	53	13	66	30.4	0.00**
		%	86.9%	33.3%	66.0%		
	Yes	No.	8	26	34		

		%	13.1%	66.7%	34.0%		
Attachment	**No**	No.	61	29	90	17.3	0.00**
		%	100.0%	74.4%	90.0%		
	Yes	No.	0	10	10		
		%	0.0%	25.6%	10.0%		
Total		No.	61	39	100		
		%	100.0%	100.0%	100.0%		

Table (12): Comparing the preoperative diagnosis by different tools to histopathologic diagnosis (the gold standard investigation) of thyroid nodules

Preoperative diagnostic tool			**Histopathology**		**Total**	**X 2**	**Kappa agreement**	**P**
			Benign	**Malignant**				
US	**B**	**No.**	2	5	7	3.32	-0.07	0.068
		%	3.3%	12.8%	7.0%			
	SM	**No.**	59	34	93			
		%	96.7%	87.2%	93.0%			
CT	**Not done**	**No.**	35	2	37	28.9	0.26	0.00**
		%	57.4%	5.1%	37.0%			
	B	**No.**	4	3	7			
		%	6.6%	7.7%	7.0%			
	SM	**No.**	22	34	56			
		%	36.1%	87.2%	56.0%			

LN FNAC	**Not done**		**No.**	53	20	73	22.3	0.24	0.00**
			%	86.9%	51.3%	73.0%			
	Done	**B**	**No.**	3	0	3			
			%	4.9%	0.0%	3.0%			
		M	**No.**	5	19	24			
			%	8.2%	48.7%	24.0%			
Thyroid FNAC	**Not done**		**No.**	10	10	20	33.08	0.41	0.00**
			%	16.4%	25.6%	20.0%			
	B		**No.**	31	0	31			
			%	38.75%	0%	40.0%			
	M		**No.**	1	39	40			
			%	19.7%	71.8%	40.0%			
	suspicious		**No.**	9	0	9			
			%	100.0%	100.0%	100.0 %			

**** High Significance**

Table (13): Sensitivity and Specificity of diagnostic tools.

Diagnostic tool	Sensitivity	Specificity	+VE Predictive	-VE Predictive	Accuracy
US	87.2%	3.3%	36.5%	28.5%	36.0%
CT	91.8%	15.3%	60.7%	57.1%	60.3%
LN biopsy	100.0%	37.5%	79.1%	100.0%	81.4%
FNAC	96.5%	76.4%	70.0%	97.5%	83.7%

DISCUSSION

Thyroid nodules are rather a common disease occurs in 4-7% of the adult population based on palpation and of 20-76%, based on ultrasound examination [(1)]. The major challenge in management of thyroid nodules remains to which nodules surgical excision is required and which can be followed conservatively. Adopting such a policy avoids unnecessary extensive procedures and diagnostic thyroidectomy, which may bring potential adverse effects [(8)].

In this work we studied 100 patients with thyroid nodules for whom surgery was indicated because of different diagnosises made by different diagnostic tools. Females (70): males (30) ratio was (2.4:1) This was in agreement with those shown by Rahman[(9)], Welker[(10)] and Zuberi[(11)] 5:1, 4:1 and 2.5: 1 respectively. This female preponderance is present in all studies including ours. The cause of high female to male ratio in this series can be explained by the fact that most of our patients are from non-endemic area. Our patients' ages ranged from 14 to 70 years with a mean age of 40.77 years. The highest frequency of thyroid nodules was found in the third decade of life (35 patients) followed by the fourth decade of life (32 patients) and the next was in the fifth decade (27 patients), and less frequency was above 60 years (5 patients) and much less below 20 (one patient). These results are slightly different from those of Nazmul Huque and Colleagues[(12)] who studied 118 patients; with nearly similar demographic data; males were 38 and females were 80 and males: females ratio was 1: 2.1, the age ranges from 11 to 60 years with a mean age of 32.5 years; where they found the highest frequency of thyroid nodules was in the fourth decade of life (54 patients).

In our study increased size of the nodule, fixation or invasion of the surrounding structure and the presence of palpable lymph nodes in the neck were highly suggestive of malignancy (Table 11). Vocal cord paralysis was not indicator of malignancy because it can also occur in benign disorders. These results go in agreement with those of Kelly and Meyer[(13)]. But in other studies nodule size is not a predictive risk factor for malignancy as regarded by Tai and Colleagues[(14)] who found that there was no great significance between nodule size larger than 4 cm and nodule size less than 4cm (P= 0.5) but Kamran and Colleagues[(15)], revealed that increasing thyroid nodule size impacts cancer risk in a nonlinear fashion but a threshold is detected at 2.0 cm, beyond which cancer risk is unchanged. In our study, malignant nodules (39) were more than 2 cm in size.

In our study: we found that right lobe is slightly more affected than left one; where we found 28 nodules in right lobe, 20 in left lobe and 52 in both Table (3). This is in agreement with that reported in Al-Robbani[(16)] study; where out of 100 cases; about 65 nodules were found in the right lobe and 35 in the left lobe. There is yet no reported predilection for any specific site and no reason has been put forward for such a predilection.

In our study, ultrasonographic findings revealed 60 patients had solid hypoechoic nodules, 19 had heterogeneous cystic nodules and 21 had homogeneous cystic nodules, most of the malignant lesions (28/39) were solid nodules and (11/39) were heterogeneous cystic nodules. These results were similar to that reported in Tarrar and Colleagues[(17)]; where out of 60 patients, 43 had solid hypoechoic nodules, 12 had heterogeneous cystic nodules and 5 had homogeneous cystic nodules, most of malignant lesions (7/8) were solid nodules and (1/8) were heterogeneous cystic nodules.

In this study: 31 smears (38.75%) have been reported a negative result (benign) on FNAC and this has been confirmed by histopathological examination, (40) smears (50%) have been reported a positive on FNAC and this had been confirmed histopathologically, except one (false positive). Our remaining 9 smears 11.25% were suspicious (cellular follicular lesion) and all (100%) were proved to be benign histopathologically. These results are supported by those of Nazmul Huque and his

colleague[12]; who found out of 118 patients, 35 smears (29.66%) were suspicious (cellular follicular lesion), 31 (88.57%) were follicular adenoma, and four (11.42%) were carcinoma.

This can be explained by the fact that cytological distinction between follicular adenoma and carcinoma is almost impossible as it depends on capsular and/or vascular invasion on histological examination (Silver and Busseniers)[18].

In this study: Incidence of cancer in thyroid swellings was 39%. Papillary carcinomas was the most frequent form found in 31 patients (79.48%) and the frequency was high in the fourth decade of life, followed by metastatic follicular carcinomas in 4 patients (10.25%) and the frequency was high in the fourth decade of life and anaplastic carcinoma in 2 (5%) and age of patients was 65 years and medullary carcinoma in 2 (5%). It shows clear predominance of papillary carcinoma over follicular and anaplastic carcinoma and more common in males in (18 patients) (58.06%) (Table: 9,12,13). The frequency of malignancy in our study is higher than that reported by Tarrar and Colleagues[17], who studied the incidence of cancer in solitary thyroid nodules only and found it 13.3%, but our study included all thyroid swellings except hyperfunctioning thyroids and included also incidentally discovered thyroid swellings while patients were seeking medical care for other reasons and referred to us from other clinics which can be considered sampling bias .

In their study Tarrar and Colleagues[17] found papillary carcinoma was the commonest lesion 50% followed by follicular 25%, anaplastic and medullary carcinoma 12.5% each, the most common age of malignancy was between 31-40 years and more common in female. These results are in agreement with ours except that of feminine predilection of cancer in their study. This may be explained by presence of past history of head and neck irradiation exposure in 10 of our male patients. Also there were 13 male patients with long standing history of heavy smoking but absent in females of our sample which although unproved to have a role in thyroid carcinogenesis but this finding was found in our study. Anyway this male predilection of malignancy in our study was found in a study by Abul Hossain et al[19].

In this study the non malignant cases were 61 patients (61%). The commonest was colloid nodule 33 cases (33%) followed by the follicular adenoma (14%), then hyperplasia (8%) the least were thyroiditis (6%) (Table 9). These results were similar to that reported by Gupta and Colleagues[20]; who found among 60 patients with benign lesions (from total 75 patients), the commonest pathological lesion was colloid nodular goiter accounting for 65%.
In this study the sensitivity and specificity of FNAC was 96.5%, 76.4% respectively table 13. This is slightly lower than the results of Shere and his colleagues[21] study, where the sensitivity and specificity were 100%, 98.6 respectively.

In this study, 2 patients were subjected to hemi-thyroidectomy, 28 to sub-total thyroidectomy and 36 to total thyroidectomy, 9 patients to total thyroidectomy with modified neck dissection and 25 to total thyroidectomy with selective neck dissection. Also 10 patients needed completion thyroidectomy; one after hemithyroidectomy and nine after subtotal thyroidectomy due to discovery of malignancy in preoperatively diagnosed benign lesions (Table 7). There were no postoperative complications after hemi-thyroidectomy but after total thyroidectomy there were 2 patients with transient hypoparathyroidism and 2 patients with unilateral vocal cord injury. After completion thyroidectomy there were 4 patients suffering transient tetany, two patients suffered bilateral vocal cord injury one had combined esophageal injury and both of them died from sepsis during the first month postoperative. These results were similar to that reported by Ali and Colleagues[22], who found fewer complications in performing hemi-thyroidectomy when compared with near total and total thyroidectomy; as regard decreased risk of RLN injury, decreased risk of hypoparathyroidism, and

the possibility of avoiding thyroid hormone replacement therapy. The mortality rate was 3%, one from esophageal injury, one from bilateral cord paralysis and one did not recover from anesthesia.

CONCLUSION AND RECOMENDATIONS

There is a significant increase in the incidence of malignancy in patients suffering from thyroid nodules. Ultrasound has a crucial role in evaluating thyroid nodules especially as a guide to FNAC. Sonar guided FNAC is a good and trustful tool in diagnosing thyroid malignancy as it proved to be safe, easy, highly sensitive and 96.5% accurate.

We recommend that all Thyroid nodules should be carefully examined and thoroughly investigated for malignancy using sonar guided FNAC.

REFERENCES

[1] Moosa F. A., Junaid M., Khan F. W., & *et al.* (2007). Prevalence of malignancy in resected specimen of patients operated for benign nodular goitre. *Pakistan Journal of Surgery*. (Volume 23, Issue 2): 129-132.

[2] Segev D. L, Umbrich C. & Zeiger M. A., (2003). Molecular pathogenesis of thyroid cancer. Surgical Oncology; (12): 69.

[3] Darwish A. H., Sindi K. A., & El Kafsi J. (2006). Pattern of Thyroid Diseases - A Histopathological Study; Bahrain Medical Bulletin; (28): 1-6.

[4] Cox M. R., Marshall S. G., & Spencer R. A., (2005). Solitary thyroid nodule, a prospective evaluation of nuclear and ultrasonography. *Ultrasound Med Biol*; volume (136), issue 3, page: 334-337.

[5] Pacini F. & De Groot L. J., (2006). Thyroid Cancer; the Thyroid and its Diseases. *Journal of Clinical Endocrinology & Metabolism*; (91): 1819-1825.

[6] Singh D. K., Shrivas R. K., Paricharak D. G,. (2013). Role of fine needle aspiration cytology in solitary thyroid nodules. In: *Journal of Evolution of Medical and Dental Sciences* 2013; Vol 2, Issue 36, September 9; Page: 6903-6914.

[7] Cibas E. S., & Ali S. Z., (2009). NCI Thyroid FNA State of science conference: The Bethesda System for reporting Thyroid cytopathology. AM J Clin Pathol 132: 658-665.

[8] Gharib H., (1997). Changing concepts in the diagnosis and management of thyroid nodules. Endocrinol Metab Clin North A; 26(4):777- 800.

[9] Rahman M. J., & Mustafa M. G., (2000). Comparative study of cancer developing in solitary thyroid nodule and multi-nodular goitre. *Bangladesh J of otorhinolargygology*; 6(1): 6-12.

[10] WelKer M. J., & Orlov D., (2003). Thyroid nodules. Am Fam Physician, Feb. 1; 67(3):55966.

[11] Zuberi L. M, Yawar A, Islam & Jabbar A, (2009). Clinical presentation of thyroid cancer patients in Pakistan- AKUH Experience. *Journal of Pakistan Association*, Available from http://Jpma.org.pk/vievv Article, accessed 7 July 2009.

[12] Nazmul Huque S. M., Ali MI, Huq M et al (2012): Histopathological pattern of malignancy in solitary thyroid nodule, *Bangladesh J Otorhinolaryngol* 2012; 18(1): 5-10.

[13] Kelly D. J., & Meyers A. D., (2013): Evaluation of solitary thyroid nodule. http://www.emedicine.com/ent/topic541.htm.

[14] Tai J., D., Yang J. L., Wu SC et al (2012). Risk factors for malignancy in patients with solitary thyroid nodules and their impact on the management. *J Can Res Ther* 2012; 8:3x79-83.

[15] Kamran S. C., Marqusee E, Kim MI et al (2013). Thyroid Nodule Size and Prediction of Cancer, In: *The Journal of Clinical Endocrinology & Metabolism* February 1, 2013 vol. 98 no. 2, 564-570.

[16] Al-Robbani A., M. (2013). Study of thyroid carcinoma in solitary thyroid nodule. In: (Dinajpur Med Col J 2013 Jan; 6 (1):58-63).

[17] Tarrar A. M., Khan O. U., & Wahla M. S., (2010). Solitary Thyroid Nodule; Frequency of Malignancy At Combined Military Hospital Rawal-pindi. *Professional Med J* Dec 2010; 17(4): 598-602.

[18] Silver S. A., & Busseniers A. E. (2012). Fine-Needle Aspiration Cytology of the Thyroid, In: (Surgery of the Thyroid and Parathyroid Glands), edited by Oertli D and Udelsman R (Eds), published by Springer-Verlag Berlin Heidelberg, 2nd edition, chapter 6, Pp. 77-93.

[19] Abul H., Zakaria S., Utpal K. D., et al. (2014): Frequency of Malignancy in Solitary Thyroid Nodule and Multi-nodular Goitre. *Bangladesh J Otorhinolaryngol*; 20(2): 55-65.

[20] Gupta M., Gupta S., & Gupta V. B. (2010): Correlation of fine needle aspiration cytology with histopathology in the diagnosis of solitary thyroid nodule. *J Thyroid Res* 2010; 2010:379051.

[21] Shere S. K., Kulkarni A. S., Phulgirkar P. P. et al (2013). Correlation of fine needle aspiration cytology with histopathology in diagnosis of thyroid lesions. In: *journal of evolution of medical and dental science*, vol, 12. issue, 26. pages; 4826-4831.

[22] Ali A. M., Elkadi T. T., Ali M. M. & Ali E. M. (2013). Total/near-total versus hemithyroidectomy for low risk well differentiated thyroid cancer: *A retrospective study. In: Egyptian Journal of Surgery* Vol. 32, No. 1,January 2013.