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Indications and Complications of Thyroidectomy in Patients with Thyroid Disease in Makkah Region, Kingdom of Saudi Arabia

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ABSTRACT

INTRODUCTION

In Saudi Arabia, thyroid cancer is the second common malignancy affecting female population. Thyroidectomy is the treatment of choice.

METHOD

Retrospective cross-sectional study. All medical records of patients who underwent thyroidectomy in Makkah were included in structured questionnaire.

RESULT

Total of 140 patients, 129 patients did thyroidectomy and 11 underwent excision of thyroglossal cyst. 91% of patients were female, the demonstrated age was between 40-60 years. The commonest indication of surgery was local compression symptoms. The commonest benign neoplastic thyroid lesion was follicular adenoma, where papillary carcinoma was the commonest malignant lesion. The most serious complicating of was recurrent laryngeal nerve injury, with rate of 7%.

CONCLUSION

This is first study of surgically treated thyroid disorders in Makkah with evaluation of rate and type of postoperative complication. The commonest indication of thyroid surgery was local compression symptoms with dysphagia as the leading symptom. Recurrent laryngeal nerve palsy was the commonest complication.

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KEYWORDS

Thyroid; Disease; Thyroidectomy; Complication; Recurrent laryngeal nerve

1. INTRODUCTION

Thyroid gland is one of the important glands in the human body. Thyroid hormones released by thyroid gland are essential for the normal physiological function of all tissues, with critical effect on metabolic rate [1].

Imbalance in the regulation of thyroid hormones can cause many disorders that range from a small goiter to life threatening diseases, such as thyroid cancer [2]. Thyroid dysfunction is one of the widespread endocrine disease. According to the American Association of Clinical Endocrinologists (AACE), 13 million persons in the United States have undiagnosed thyroid disorder [3].

Females are well known to be affected by thyroid disease; in Saudi Arabia, thyroid cancer is the second most common malignancy among female population that peaks from 35-39-years of age [4], with an exponential increase in the incidence rates between 2000 and 2010 with a significant geographical variation [5]. Thyroidectomy is common performed surgery in patients with thyroid gland disease [6]. Regardless of advances in conservative management, thyroid surgery remains the treatment of choice in many cases. Indication for thyroid surgery include carcinoma of the thyroid, hyperthyroidism and most commonly local obstructive symptoms or the presence of retrosternal extension of a goiter [7].

To the best of our knowledge, this is the first cross sectional study of surgically treated thyroid disorders in Makkah region with analysis of indication and to evaluate the rate and type of postoperative complication. We were also able to identify the histopathological pattern of thyroid lesions.

2. MATERIALS AND METHODS

This is retrospective cross-sectional study of four years (between January 1, 2013 to December 31, 2016). This study was approved by the Institutional Review Board (IRB) for biomedical ethics committee of Umm Al-Qura University, Makkah, Kingdom of Saudi Arabia.

All patients who underwent thyroid surgery at Makkah Hospitals (Al-Noor, Hera'a, King Abdul Aziz and King Faisal hospitals) during the study time were included. A total of 140 patients were admitted to the department of general surgery for elective thyroid surgery.

A structured questionnaire was used to collect information from patients' medical records in which demographic data including age, gender, clinicopathological details of thyroid disease were obtained. For statistical analysis, Statistical Package for Social Sciences (SPSS) version 22 was used. The Chi-square test was used to determine the relationship between the qualitative characteristics (non-measurable variables). The statistical significance level (p-value) was 0.05 or lower.

3. RESULT

Total number of thyroid surgeries performed in Makkah region over four years period from January 2013 to December 2016 was 140 cases, of which 129 patients underwent thyroidectomy and 11 cases underwent excision of thyroglossal cyst. Out of 129 thyroidectomy cases, 118 patients were female and 11 were male giving female: male ratio of 11:1.

Most of the thyroid diseases 57.4% (n = 74) were seen in age group 20-40-years old. The age group between 40-

60-years-old and the elderly age group above 60-years constituted 36.4% and 6.2% respectively.

The clinical presentations of thyroid disease are described in Table 1.

Clinical Manifestation	No. (%)	Palpable Thyroid Nodule	
Neck mass	128 (99)		**No. (%)**
Local Compressive symptoms	48 (37.21)		114 (88.37)
Hyperthyroidism symptoms	12 (9.30)	**Yes**	
Eye Symptoms	2 (1.55)		15 (11.63)
Hypothyroidism symptoms	17 (13.18)	**No**	

Table 1: Clinical Manifestation of Thyroid Lesions.

All patients had preoperative assessment of the thyroid function by measuring thyroid stimulating hormone (TSH) level. 65% (*n* = 84) had normal thyroid function, where hyperthyroidism was detected in 16 patients and 29 patients had hypothyroidism by laboratory test.

Fine needle aspiration (FNA) was done for 73% (*n* = 94) of patients while 27% (*n* = 35) of patients have not been investigated. Preoperative diagnoses, multinodular goiter was made in 63 % (*n* = 81), while 10% (*n* = 13) of patients were diagnosed with thyroid cancer. 27% (*n* = 53) of patients had undetermined diagnosis.

The indications of thyroid surgery are shown in Table 2, in which the most common indication was local compression symptoms. The other indications were: risk of malignancy, cosmetic reasons and failure of medical treatment. The rest of the patients, we could not find the indication of thyroid surgery in the documents.

Indication	No. (%)
local Compression symptoms	55 (43)
- Dysphagia	29 (22.5)
- Shortness of Breath	27 (21)
- Voice Change	17(13)
Risk of Malignancy	39 (30)
Cosmetic	18 (14)
Failure of medical treatment	14 (11)
Unknown Indication	8 (6.20)

Table 2: Indication of Thyroid Surgery.

When it comes to type of surgery, 46% (*n* = 59) of the patients underwent total thyroidectomy and 54% (*n* =70) underwent lobectomy.

The histopathological Pattern of thyroid lesions is shown in Table 3.

Non- Neoplastic Thyroid Lesion	No. (%)	Neoplastic Thyroid Lesion	No. (%)
Colloid goiter	38(29)	**Follicular Adenoma**	21(16)
Hyperplastic nodule	33(26)	**Hurthle cell Adenoma**	2(2)
Hashimoto thyroiditis	10(8)	**Papillary Carcinoma**	11(9)
Lymphocytic thyroiditis	5(4)	**Follicular Carcinoma**	5(4)
		Lymphoma	2(2)

Table 3: Histopathology Pattern of Thyroid lesion.

Among these 129 thyroidectomy cases, 16% (*n* = 21) had postoperative complications as shown in Table 4. Recurrent laryngeal nerve palsy occurred in 43 % (*n* = 9) in which (*n* = 7) had preoperative laryngoscope that showed normal vocal cord motility.

Complication		Type of Complication	
	No. (%)		**No. (%)**
		Recurrent laryngeal nerve injury	9(42)
Yes	21 (16)	**Hypoparathyroidism (Hypocalcemia)**	4(19)
		Hypothyroidism (with lobectomy)	7(33)
No	108 (84)	**Hematoma**	1(5)

Table 4: Post-Operative Complications.

Hypocalcemia was observed in 19% (*n* = 4), hematoma occurred in one patient. In patients who underwent lobectomy, hypothyroidism occurred in 33% (*n* = 7). No surgical wound infection was found in our study.

In Table 5 the Chi-square test was used to determine the relationship between type of thyroid surgery and neoplastic thyroid lesions resulting in p-value of 0.050

<= 0.050, which means that there is weak relation but not clinically significant. It can also be seen that there is no significant relationship between histopathological diagnosis and gender of the patients, age of the patients and post-operative complications (p-value is greater than 0.05).

5. DISCUSSION

In our study, 91% of patients are female, which is compatible finding with previous published articles. In South Indian study, out of every eight young female, one female is expected to have thyroid dysfunction with prevalence of 12.5 % [8]. In Kingdom of Saudi Arabia, few articles describe the epidemiology of thyroid disease with high incidence in female population [9,10].

Additionally, patients are diagnosed with thyroid disorders at an early age as 57% of our study population were aged between 20-years and 40-years, with 36% of patients being older than 40-years. Consequently, it may be concluded that young people are expected to be diagnosed with thyroid disorders more likely than the elderly.

We have shown in our study that the most common indication of thyroid surgery is local compression symptoms with dysphagia as the leading symptom followed by shortness of breath and change in voice respectively.

Compared to literature review in Germany over 26-years that showed suspicious of malignancy as the first cause of thyroidectomy followed by local compression symptoms and cosmetic removal of the gland as the least cause of indication [6].

		Neoplastic Thyroid Lesions												Chi-square	
		Non-neoplastic		Follicular Adenoma		Hurthle cell Adenoma		Papillary Carcinoma		Follicular Carcinoma		Lymphoma			
		N	%	N	%	N	%	N	%	N	%	N	%	X^2	P-value
Gender	**Male**	7	8.00 %	0	0.00%	1	50.00 %	1	9.10 %	2	40.00 %	0	0.00%	0.663	0.416
	Female	81	92.00 %	21	100.00%	1	50.00 %	10	90.90 %	3	60.00 %	2	100.00%		
Age	**<40 years**	49	55.70 %	12	57.10 %	0	0.00%	8	72.70 %	4	80.00 %	1	50.00 %	11.674	0.307
	40-60 year	33	37.50 %	8	38.10 %	2	100.00%	3	27.30 %	0	0.00%	1	50.00 %		
	Above 60 year	6	6.80 %	1	4.80%	0	0.00%	0	0.00 %	1	20.00 %	0	0.00%		
Type of surgery	**Subtotal**	9	10.20 %	0	0.00%	0	0.00%	3	27.30 %	0	0.00%	0	0.00%	18.307	0.05*
	Total thyroidectomy	32	36.40 %	5	23.80 %	0	0.00%	6	54.50 %	3	60.00 %	1	50.00 %		
	Lobectomy	47	53.40 %	16	76.20 %	2	100.00%	2	18.20 %	2	40.00 %	1	50.00 %		
Complications	**No**	72	81.80 %	19	90.50 %	1	50.00 %	9	81.80 %	5	100.00%	2	100.00%	4.76	0.446
	Yes	16	18.20 %	2	9.50%	1	50.00 %	2	18.20 %	0	0.00%	0	0.00%		

Table 5: Chi-Square Tests.

Regarding pathology result in this study, we found non-neoplastic thyroid lesions to be more frequent than neoplastic lesions with colloid goiter as the comments non-neoplastic finding. Most common benign neoplastic thyroid lesion was follicular adenoma, where papillary carcinoma was the commonest malignant thyroid lesion.

In Saudi Arabia, several histopathology-based reviews on thyroid disease are present in the literature i.e. A study from Riyadh, during the period between 2000 to 2009 showed that there is relative increase in the incidence of both non-neoplastic and neoplastic thyroid disorders. They also found that papillary thyroid carcinoma was the most common histological type of thyroid cancer [11].

A retrospective study on histopathology finding of thyroidectomy specimen in Almadina region reported non-neoplastic lesions were common than neoplastic lesions, where the follicular adenoma was the commonest benign tumor and the papillary carcinoma was the commonest malignant lesion [12].

Up to date, only two studies of thyroid gland disease were conducted in Makkah region [13,14].

The most serious complicating of thyroidectomy in the present study is recurrent laryngeal nerve (RLN) injury, the rate of recurrent laryngeal nerve injury was 7%. The incidence of RLN injury in previous literature has been reported between 1% - 2% [15].

A meta-analysis study of 14,934 patients showed incidence of RLN paralysis 3.4% for all thyroid surgery with higher incidence for malignant tumor [16].

The main limitation of this study is its retrospective design. We couldn't obtain some data from the patient's electronic or handwritten files. Furthermore, the follow-up of the patients with RLN injuries.

6. CONCLUSION

Our study reinforces that thyroid disease is more common in females than males with ratio of 11:1. Most common indication of thyroidectomy in our study was compression symptoms with risk of malignancy was very low among the patients. Recurrent laryngeal nerve palsy among with hypocalcemia were the most common post-operative complications. We think that the number of thyroid surgeries is under recorded in our region and further studies are needed to confirm that.

7. ACKNOWLEDGEMENT

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8. CONFLICT OF INTEREST

The authors declare no conflict of interest

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