

Nature and outcome of malignant goiter: a single institutional experience from the eastern province of Saudi Arabia

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Abstract

Background: Recent years have witnessed a dramatic increase in the number of malignant goiters among adolescents and adults.

Aim: The aim of this work is to review patients with goiter, as regards, their nature, demographic characterization, clinical presentation and preoperative histopathological data obtained by Fine Needle Aspiration Cytology (FNAC). It also aimed to review; the operative data and post-operative histopathological pattern of all patients from a tertiary care hospital in the Eastern Province of Saudi Arabia. Moreover, the current retrospective study was designed to evaluate the nature, line of management and outcomes of malignant goiter in the same geographical region.

Patient and Methods: The study took place in a period of 4 years from December 2015 to January 2019. Patients demographic data, clinical presentation, Intra-operative findings. Pre and postoperative histopathological staging and grading were all recorded. postoperative follow up whether early or late were also included.

Results: A total of 65 patients underwent surgery. The female to male ratio was found to be 5:1 (48 females and 17 males). Patients' age ranged from 8 to 70 year with the mean of 34.4 ± 11.7 (mean \pm SD). Solitary nodule was the main presentation in 80% of cases while 20% were multinodular swellings. Symptoms of increased thyroid hormone functions were recorded in 13 patients (20%). Papillary carcinoma was recorded in 52 patients (80%) while 10 patients were having follicular carcinoma. The remaining three patients (4.6%) suffered of lymphoma, no medullary or anaplastic tumors were recorded.

Conclusion: Thyroid cancer is quiet high among Saudi patients within the Eastern Province, the reason needs to be thoroughly investigated. Papillary type of carcinoma is the most commonly encountered pathological type of malignancy followed by follicular carcinoma and lymphoma. Further prospective and meta analytic studies may be needed for a more accurate and thorough assessment of the reasons that led to the increasing number of thyroid malignancies and their correlation to environmental factors.

Introduction

Thyroid cancer is the most common malignant tumor of the endocrine system¹. In the kingdom of Saudi Arabia. Collectively thyroid cancer is reported to be the second common cancer among women. It constitutes 8.8% of malignancies in the kingdom. Moreover, it constitutes about 12% of malignancy among females. It is significantly commoner in females than males with a ratio of 1 to 0.3^{2,3}. The overall incidence of newly diagnosed thyroid cancer cases accounts for 5.4 % of all newly diagnosed cancer cases^{4,5}.

Saudi Cancer Registry of the year 2008 ranked thyroid cancer as the second commonly encountered cancer among females while it ranked thirteen among males. The areas that have the higher incidences were as follow; Tabuk (6 /100,000), Eastern province (5.9 / 100,000), Riyadh (5.8/100,000), Qassim

(5.7/100,000) and the northern region (4.9/100,000). Thyroid cancer occurs at a relatively earlier age with median of 40, 44 among females and males, respectively. The commonest histological type was papillary adenocarcinoma.⁶

Nonetheless, thyroid cancer is ranked as the fifth common malignancy among the Gulf Cooperation Council (GCC) countries with a higher incidence among females. It is considered as the second commonly encountered female malignancy in GCC.⁷

They may present as thyroid nodule or even multinodular goiter with some extra glandular manifestations of compression such as dysphagia and/ or dyspnea. Sometimes patient may present with thyrotoxicosis manifestations. Yet, in most cases they present as asymptomatic nodules in euthyroid patients.^{8,9,10}

Thyroid cancer treatment entails many modalities such as; radical thyroidectomy, radioactive ablation and hormonal replacement therapy to antagonize thyroid stimulating hormone⁹. Recently new therapeutic modalities have been evolved concentrating on specific mutation pathways and intranuclear gene regulation¹¹. The current study aimed to review patients with goiter, as regards, their nature, demographic characterization, clinical presentation and preoperative histopathological data obtained by Fine Needle Aspiration Cytology (FNAC). It also aimed to review; the operative data and post-operative histopathological pattern of all patients from a tertiary care hospital in the Eastern Province of Saudi Arabia. Moreover, the current retrospective study was designed to evaluate the nature, line of management and outcomes of malignant goiter in the same geographical region.

Patient And Methods

An ethical approval for the study was obtained from our institutional research board (IRB). A four-year retrospective study was carried out in the period between December 2015 to January 2019. All patients with malignant goiter during this period were included. Those patients' records were thoroughly reviewed to report their demographic data such as; age, gender, nationality, place of residence and occupation. Also reported, was the clinical presentation/s; including the nature of enlargement, presence of toxic symptoms, results of FNAC and co-morbid conditions. Operative findings, presence of lymph node enlargement, operative TNM staging and the implemented surgical technique were also retrieved from the files.

The pre- and post-operative microscopic pathology, type of malignancy, pathological staging, histological grading, vascular involvement were recorded. Length of postoperative follow up, secondary surgical procedures or radioiodine treatment were looked for.

Results

Sixty-five patients were evaluated during this four-year study period. Saudi nationals were 61 (93.8%). The female to male ratio was 5:1 (54 females, 11 males). The mean age was 34.4 years (SD 11.7). The youngest was an 8-year-old boy with microfollicular adenoma while the oldest was a 70-year-old female with multinodular goiter. More than two thirds (62%) of patients were between 21 years and 40 years. The age distribution is given in Table 1. All patients were Saudi nationals who were originally and lived in AlAhsa area.

Table 1
Age distribution

Age Group	Number (Percentage)
Less than 20 years	7(10.7%)
21–30 years	21 (32.3%)
31–40 years	19 (29.3%)
41–50 years	9 (13.9%)
51–60 years	5 (7.7%)
61–70 years	04 (6.1%)
Females 54 (83%) Males 11 (17%)	

The geographical distribution of patients was within Al-Ahsa area without any predilection to any specific village or town. However, it was seen that 40% (26/65) of malignancies came from the northern part of Al-Ahsa, with a significant number coming from the village of Al-Omran.

FNAC initially showed 57 patients (87.7%) to be malignant while 8 patients (12.3%) were benign. Those patients were; 3 multinodular goiters, 2 with thyroid adenoma, one Hashimoto’s thyroiditis, one diffuse colloid goiter and the last one was reported as Grave’s disease. Most cases were of the euthyroid status except for nine patients (13.8%) who showed hyperthyroidism. Out of those eight patients; four presented with diffuse enlargement of the thyroid gland. While the remaining four presented as, two with multinodular goiter, and two with solitary thyroid nodules. Solitary thyroid nodule was the most common presentation among the 65 studied patients with a percentage of 80% while the remaining 20% had multinodular swellings.

All of the 65 patients underwent post-operative histopathological assessment that proved malignancy in all of them (100%), despite the initial FNAC results.

Post-operative findings showed that papillary carcinoma was found in 52 (80%), follicular carcinoma in 10 (15.4%) and lymphoma in 3 (4.6%). There were no medullary or anaplastic tumors (Table 2.). The tumor size among the FNAC-initially-proven malignancy was 1 cm to 8 cms. Six tumors (9.2%) were microscopic, 39 (60%) were less than 2 cms, eight (12.3%) measured between 2–4 cms and eighteen (27.7%) measured more than 4 cms in size. Lymph node metastasis were found in twelve patients, seven

being N1 and five being N1a. There were no distant metastases. Near total thyroidectomy was the primary procedure in 23 (35.3%) patients while hemithyroidectomy was performed in 24 (37%) of patients. Subtotal thyroidectomy was done in 18 (27.7%) of patients.

Table 2
Different pathological types

Pathology	Number (Percentage)
Papillary carcinoma	52 (80%)
Follicular carcinoma	10 (15.4%)
Anaplastic carcinoma	0 (0%)
Medullary carcinoma	0 (0%)
Lymphoma	03 (4.6%)
Total	65 (100%)

In patients with evidence of lymph node disease at surgery, excision of enlarged nodes or a formal neck dissection was done. Excision of lymph nodes was done in eight while modified radical neck dissection was done in four more patients.

After reviewing the histopathology slides of those initially reported as benign by FNAC, it was decided to go on for complete thyroidectomy in 6 patients while the remaining 2 patients underwent radioiodine therapy.

The mean follow up was 14 months with a range from one up to 45 months. Thirty four patients (52.3%) had a follow up for up to one year, 21 patients (32.3%) between one and three years, nine patients (13.8%) between three and for years and one followed up for five years.

Discussion

Thyroid disorders form one of the common chronic diseases. In a study of family practice in Saudi Arabia, it was seen that 3.5% of patients attending the family health clinic suffered from thyroid disorders¹⁵.

Thyroid cancer is considered as the commonest endocrinal malignancy with globally different incidental rates. However, the incidence of thyroid malignancies is still increasing with many characteristic changes. In our current retrospective study, papillary carcinoma was the highly predominant thyroid cancer, while follicular carcinoma and lymphoma were less frequent. These data coincide with previously published reports from the same country^{15,16,17}. A study reported papillary carcinoma to have an incidence of 82.2% and follicular carcinoma to be 4.4% of all thyroid malignancies also supports our data. This report

showed a lower frequency in incidence of follicular cancer (4.4%) compared to our data of 8.3% follicular thyroid cancer¹⁵. Yet, it was coinciding with other reports from Kingdom of Saudi Arabia^{16,17}.

Nevertheless, etiological factors for thyroid malignancy such as; familial tendency, endemic goiter and exposure to irradiation were not reported in any patients of our current study. Females were more affected by thyroid malignancies compared to their males' counter parts in the current study with the ratio of 5:1. This data simulated similar reports from the same country¹⁸.

However, others showed male predominance as regards thyroid cancers. They attributed this notion to the ethnic background of the patients who were not Saudi in comparison to the Saudi population. This may be interpreted by the demographic pattern of the expatriates in our nation who were mostly men. Therefore, this incidence could not be considered as a reliable tool^{19,20}.

We reported the mean patients age to be 34.4 years. This is relatively lower than other local and international studies¹⁸⁻²⁰. It may be explained by the changes of the clinical and epidemiological behavior of the disease world wide²¹. Some reports denoted that thyroid cancer patients' age may influence prognosis of the disease beside other factors such as; the histopathological findings, tumor size, local extension, nodal status and the operative procedure. The meta analytic studies reported that distant metastasis, age and tumor size were highly significant prognostic factors^{22,23}. On the other hand, others related the prognostic effect of age on the outcome of thyroid cancer patients to the higher prevalence of associated pathologies among older patients^{24,25}. We reported solitary thyroid nodule to be the most common presentation in our series of thyroid malignancy in accordance with data in the literature²⁶. However, others reported contradictory data, where cases of multinodular goiter (66.7%) presented with thyroid cancer due to the late presentation of their patients¹⁸.

FNAC confirmed the diagnosis of thyroid cancer in 88% of patients. This simulated previously published data^{18,27}. Those patients with negative FNAC proved to have thyroid cancer in the post-operative histopathological specimen.

In conclusion, thyroid cancer is the most commonly frequent endocrinal malignancy in our institute as well as worldwide. FNAC showed a high positive percentage of reliability for diagnosing thyroid cancer. Therefore, it is recommended to adapt this technique as the initial tool of screening goiter patients.

Further studies and metanalytic reports need to be addressed in the Eastern province of Saudi Arabia to conclude solid holistic view of the problem of thyroid cancer.

Table 3
TNM Staging

Tis	T1	T2	T3	T4	N1	N1a	M0	M1
05 (7.7%)	41 (63%)	09 (13.8%)	10 (15.3%)	00	7 (10.7%)	5 (7.6%)	00	00

Table 4
Initial surgical procedures

Primary operation	Number (Percentage)
Near total thyroidectomy	23 (35.3%)
Hemithyroidectomy	24 (37%)
Subtotal Thyroidectomy	18 (27.7%)
Lymph node excision	08 (12.3%)
Modified neck dissection	04 (6.2%)

Table 5
Subsequent therapy

Completion of thyroidectomy	06
Modified neck dissection	01
Radioiodine therapy	03

Table 6
Follow up period

Less than 12 months	34
12–36 months	21
36–45 months	10

Declarations

Ethics approval and consent to participate

Experiments were conducted after obtaining the institutional researchers' board (IRB) of college of Medicine, King Faisal University Ethical approval number 33-8-29RSR on the manuscript.

Consent for publication

We authorize the BMC pediatrics for publication of identifying images or other personal or clinical details of participants that compromise anonymity. (Not applicable)

Availability of data and material

All data and material are available upon request

Competing interests

The authors declare that there is no compete or conflict of interests regarding the publication of this article.

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Authors' contributions

MYID author 1 created the idea, formulated the hypothesis OMZ (Author 2) write the proposal, AMS (author 3) write the methodology. All authors actively participated in Writing, critical appraisal, review of the script and patient record review

(all authors) All participating authors have thoroughly read and approve the current manuscript

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Figures

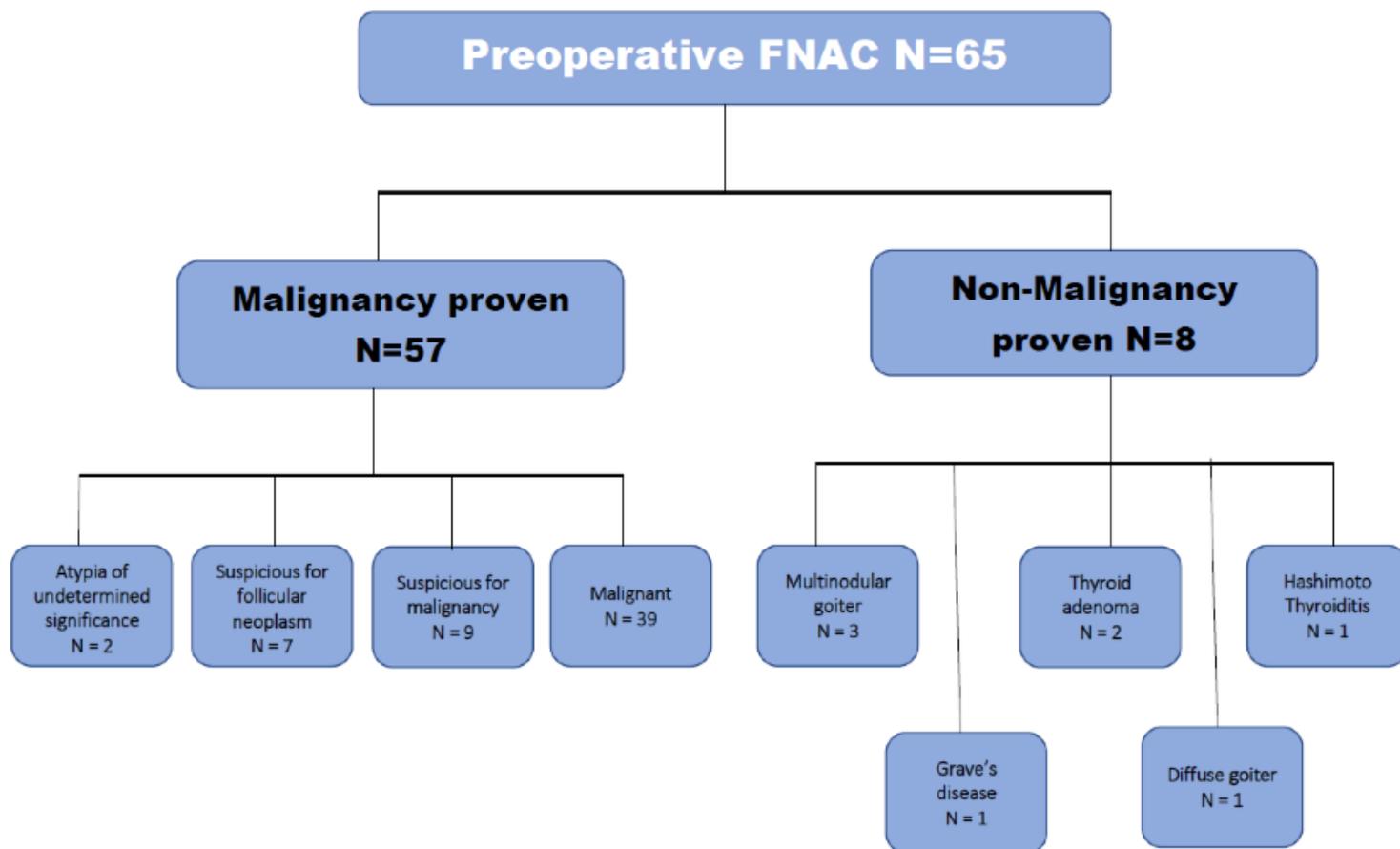


Figure 1

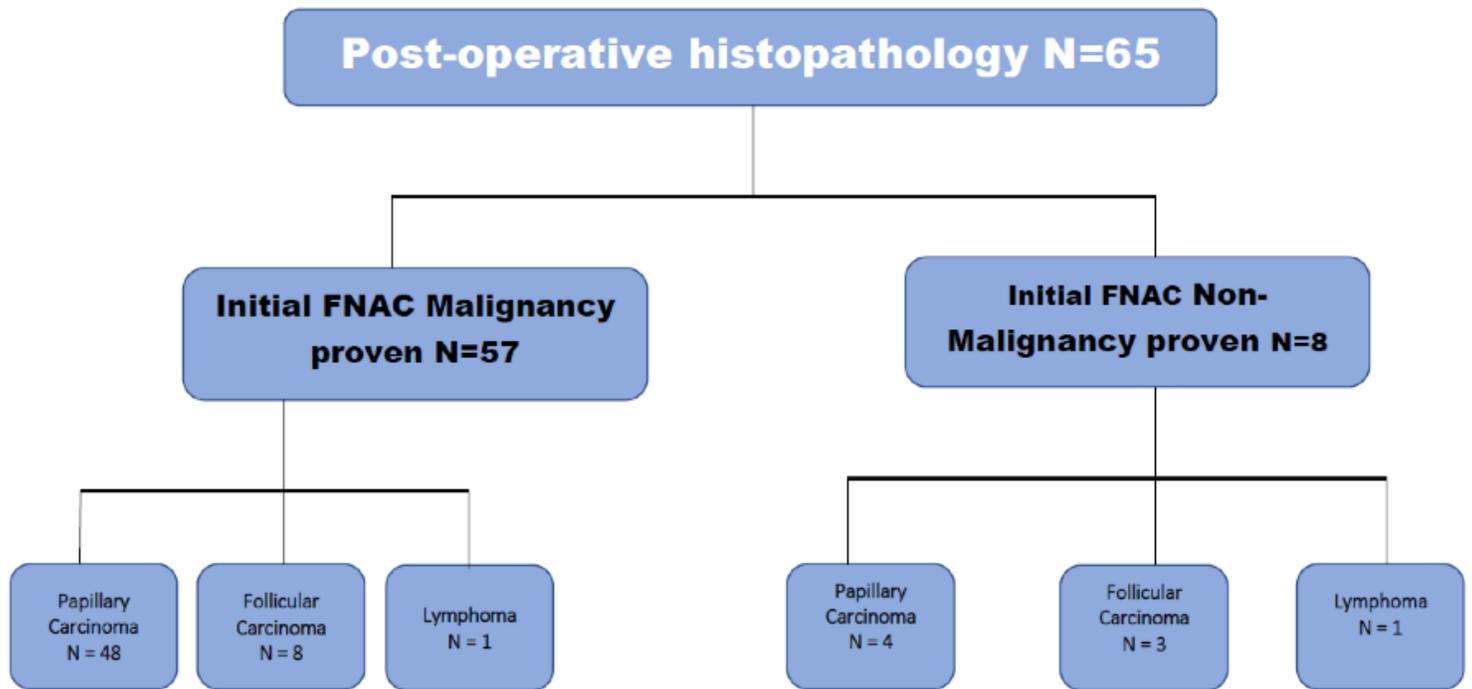


Figure 2

Post-operative histopathology