

Thyroid Surgeries in a Single Centre, 2010-2014

Jaffar Y. Al Khuzai, MBBCh, MRCSI, CABS, FACS* Hawra I. Kamal, MB BCh BAO**
Haneen Alboosta, MD***

Background: Thyroid surgery is the preferred modality of treatment in malignant and benign thyroid disease including papillary thyroid cancer and multinodular goiter.

Objective: To describe the epidemiology of surgically treated thyroid disease in a single center, the cytological and histological patterns and assess the sensitivity and specificity of fine-needle aspiration cytology (FNAC) in diagnosing thyroid nodules with malignant potentials.

Design: A Retrospective Study.

Setting: Department of Surgery, Salmaniya Medical Complex, Kingdom of Bahrain.

Method: Data was collected for all thyroid surgeries performed from 1 January 2010 to 30 December 2014, including preoperative FNAC and postoperative histopathology reports.

Result: Two hundred surgeries were performed during the study period. One hundred thirty-two (66%) were benign, and 68 (34%) were malignant. Nodular goiter was the most common benign pathology, 98 (74.2%), and papillary thyroid cancer constituted 63 (92.6%) of all thyroid malignancies. The mean age of patients was 42 years (17-88), with a female predominance 166 (82.9%) observed in both benign and malignant pathologies.

Conclusion: Thyroid surgeries were most commonly performed for benign pathologies, and papillary thyroid cancer was the most frequent histopathological type of thyroid carcinoma. The pattern is similar to that of other GCC populations. In our unit, FNAC was a reliable tool in pre-operative diagnosis.

thyroidectomy, subtotal thyroidectomy and total completion thyroidectomy. The histopathological findings were classified into four groups: (1) multinodular goiter, (2) thyroiditis, (3) adenoma (follicular adenomas and Hurthle cell type adenoma), (4) malignant tumors (follicular, papillary and medullary carcinoma).

The data were analyzed using the Statistical Package for the Social Sciences version 24.

RESULTS

Two hundred twenty-nine surgeries were performed over a five-year period (2010-2014). Twenty-nine cases were excluded due to missing histological reports; therefore, 200 cases were included in the study. Patients' age ranged from 17 to 88 years with a mean age of 42 years. Females constituted 83% and female to male ratio was 5:1. Patients' characteristics are summarized in table 1.

Table 1: Personal and Clinical Characteristics

Variable	Gender		Total
	Males	Females	
Frequency	34 (17%)	166 (83%)	200 (100%)
Mean age (years)	49	40	42
Postoperative histological diagnosis			
Benign thyroid disease	22 (11%)	110 (55%)	132 (66%)
Malignant thyroid disease	12 (6%)	56 (28%)	68 (34%)
Total	34 (17%)	166 (83%)	200 (100%)
Type of operation			
Hemithyroidectomy	18 (9%)	82 (41%)	100 (50%)
Total thyroidectomy	9 (4.5%)	58 (29%)	67 (33.5%)

Preoperative FNAC reports were found in 132 cases. Figure 1 and tables 4 and 5 illustrate the correlation of postoperative histological diagnosis with each category FNAC results.

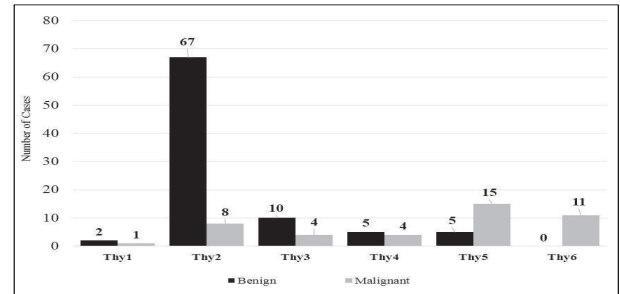


Figure 1: Cyto-Histologic Diagnostic Correlation of Thyroid Tissues (132)

Table 4: Association between FNAC and Histopathology

Histopathology/FNAC	Malignant/ Suspicious	Benign	Total
Malignant	TP= 30	FP=13	43
Benign	FN= 10	TN= 79	89
Total	40	92	132

FNAC: Fine needle aspiration cytology

Sensitivity (true positive ÷ true positive + false negative)

Specificity (true negative ÷ true negative + false positive)

Accuracy (true positive + true negative ÷ total evaluations)

Positive Predictive Value (true positive ÷ true positive + false positive)

Negative Predictive Value (true negative ÷ true negative + false negative)

Table 5: Pre-Operative FNAC Results and Postoperative

reported in the United States, 52 and 50 in Brazil, 52 in Poland and 49 in Turkey^{2,3,8-10}.

Our study confirms the gender disparity in thyroid cancer described in the literature. In this study, not only did thyroid cancer predominate in females, but also presented nine years earlier, which is consistent with an earlier study from Bahrain⁶. We found a female to male ratio of 4.7:1, and thyroid cancer in females constituting 82.4% of all cases. This finding is higher than that reported ten years earlier (69.2%)⁶. In Bahrain, thyroid cancer ranked third most common cancer in females in 1998-2001, according to the report of cancer statistics in the GCC countries¹¹. Similarly, it is ranked the third most common among Kuwaiti women and second most common among Saudi women¹². The female predominance observed in this study is similar to those of the previous studies from KSA, UAE, Yemen, Kuwait, Poland, Togo, Turkey, and Brazil^{7,9,10,13-17}. In contrast, thyroid cancer is the 16th most common among females in Ireland¹⁸.

The most common histopathological type of thyroid carcinoma was papillary carcinoma which accounted for 92.6% of the malignant cases, compared to 96.8% in the previous data from Bahrain⁶. These results are similar to what is reported in the international literature. Papillary and follicular cancer make up the majority (>90%) of all thyroid cancers worldwide¹. Papillary thyroid cancer constituted the majority of diagnosed thyroid cancer with variations in relative frequencies in reported studies from KSA, Poland, India, Brazil, Turkey, Germany, Italy, China and Philippines^{2,7,9,10,13,14,19-24}. Even in Africa where follicular thyroid cancer was predominant over papillary in the 1980s, a more frequent occurrence of papillary thyroid cancer

unit, FNAC was a reliable tool in preoperative diagnosis. Nevertheless, further prospective study to reveal the long-term prognosis is advised.

Author Contribution: All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

Potential Conflicts of Interest: None.

Competing Interest: None.

Sponsorship: None.

Acceptance Date: 3 February 2018.

Ethical Approval: Approved by Department of General Surgery, Salmaniya Medical Complex, Bahrain.

REFERENCES

1. Siegel RL, Miller KD, Jemal A. Cancer Statistics, 2017. *CA Cancer J Clin* 2017; 67(1):7-30.
2. Konturek A, Barczyński M, Stopa M, et al. Trends in Prevalence of Thyroid Cancer Over Three Decades: A Retrospective Cohort Study of 17,526 Surgical Patients. *World J Surg* 2016; 40: 538–544.
3. Davies L, Welch HG. Current Thyroid Cancer Trends in the United States. *JAMA Otolaryngol Head Neck Surg* 2014; 140(4):317-22.

13. Alhozali A, Al-Ghamdi A, Alahmadi J, et al. Pattern of Thyroid Cancer at King Abdulaziz University Hospital, Jeddah: A 10-Year Retrospective Study. *Open Journal of Endocrine and Metabolic Diseases* 2016; 6(3): 121-125.
14. Raddaoui E, Naseem Zaidi S. Epidemiology and the Histopathological Pattern of Diagnosis of Thyroid Diseases in a University Hospital in Riyadh, Saudi Arabia. *Journal of Hematology and Oncology Research* 2015; 1(4): 11-8.
15. Al-Zaher N, Al-Salam S, El Teraifi H. Thyroid Carcinoma in the United Arab Emirates: Perspectives and Experience of a Tertiary Care Hospital. *Hematol Oncol Stem Cell Ther* 2008; 1(1):14-21.
16. Awad SAS, Ashraf EM, Khaled AS, et al. The Epidemiology of Thyroid Diseases in the Arab World: A Systematic Review. *Journal of Public Health and Epidemiology* 2015; 8(2): 17-26.
17. Darre T, Amana B, Pegbessou E, et al. Descriptive Epidemiology of Thyroid Cancers in Togo. *Asian Pacific Journal of Cancer Prevention: APJCP* 2015; 16(15):6715-6717.
18. Darre T, Amana B, Pegbessou E, et al. Descriptive Epidemiology of Thyroid Cancers in Togo. *Asian Pac J Cancer Prev* 2015; 16(15):6715-7.
19. Lo TE, Uy AT, Maningat PD. Well-Differentiated Thyroid Cancer: The Philippine General Hospital Experience. *Endocrinol Metab (Seoul)* 2016; 31(1):72-9.
20. Al Bouq Y, Fazili F, Gaffar H. The Current Pattern of Surgically Treated Thyroid Diseases in the Medinah Region of Saudi Arabia. *JK-Practitioner* 2006; 13(1):9-14.
21. Kolar A, B Anitha, P Letha, et al. Pattern of Thyroid Disorder in Thyroidectomy Specimen. *International Journal of Medical Science and Public Health* 2014; 3(12):1446-8.
22. Hölzer S, Reiners C, Mann K, et al. Patterns of Care for Patients with Primary Differentiated Carcinoma of the Thyroid Gland Treated in Germany During 1996. U.S. and German Thyroid Cancer Group. *Cancer* 2000; 89(1): 192-201.
23. Dal Maso L, Lise M, Zambon P, et al. Incidence of Thyroid Cancer in Italy, 1991-2005: Time Trends and Age-Period-Cohort Effects. *Ann Oncol* 2011; 22(4):957-63.
24. Liu X, Zhu L, Wang Z, et al. Evolutionary Features of Thyroid Cancer in Patients with Thyroidectomies from 2008 to 2013 in China. *Sci Rep* 2016; 6:28414.
25. Ogbera AO, Kuku SF. Epidemiology of Thyroid Diseases in Africa. *Indian J Endocrinol Metab* 2011; 15(Suppl 2): S82-8.