بسم الله الرحمن الرحيم

High Rates of Underlying Thyroid Cancer In Patients Undergoing Hyroidectomy For Hyperthyroidism

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Introduction

* Hyperthyroidism is a pathologic disorder in which excess thyroid hormone is synthesized and secreted by the thyroid Gland.

* The most common cause of hyperthyroidism is Graves' disease, toxic multinodular goiter, toxic solitary nodule.

* In the past, the low TSH was thought to be protective against thyroid cancer.

Methods

- A retrospective review, 1298 patients who underwent thyroidectomy, by two endocrine surgeons between 2009 and 2018

- 138 patients met the inclusion criteria for the study

- All patients in the study underwent total thyroidectomy or thyroid lobectomy with isthmusectomy

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Results

Table 1 – Rate of index and incidental malignancy for the study population as a whole and comparing between Grave's disease, toxic MNG, and toxic solitary nodule groups.

	Total (N = 138), n (%)	Graves' disease (n = 80), n (%)	Toxic MNG (n = 46), n (%)	Toxic solitary nodule (n = 12), n (%)
Total malignancy	30 (22)	13 (16)	11 (24)	6 (50)
Index nodule malignancy	17 (12)	8 (10)	6 (13)	3 (25)
Incidental malignancy	13 (9)	5 (6)	5 (11)	3 (25)
No malignancy	108 (78)	67 (84)	35 (76)	6 (50)

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Table 2 — Ultrasound characteristics for index nodules in the study population as a whole.

	Benign ($n = 38$), n (%)	Malignant ($n = 20$), n (%)	P value
Dominant nodule characteristics			<0.05
Solid	20 (53)	16 (80)	
Mostly cystic	3 (8)	3 (15)	
Mixed	15 (40)	1 (5)	
Dominant nodule calcifications			0.313
None	32 (87)	14 (70)	
Micro (any)	3 (8)	4 (20)	
Coarse (only)	2 (5)	2 (10)	
Dominant nodule echogenicity			0.096
Hypoechogenic	17 (49)	7 (35)	
Isoechogenic	17 (49)	9 (45)	
Hyperechogenic	1 (3)	4 (20)	
Dominant nodule borders			0.244
Regular (includes halo)	30 (83)	14 (70)	
Irregular	6 (17)	6 (30)	
Dominant nodule taller-than-wider			0.871
No	30 (83)	17 (85)	
Yes	6 (17)	3 (15)	

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Table 3 – Malignancy characteristics for the study population as a whole and comparing between Grave's disease, toxic MNG, and toxic solitary nodule groups.

Characteristic	Total, N = 30	Grave's disease, n = 13	Toxic MNG, n = 11	Toxic solitary nodule, n = 6
Average size of malignancy (cm)	0.90	1.13	0.78	0.63
Index nodule (cm)	1.28	1.48	1.18	0.97
Incidental nodule (cm)	0.40	0.58	0.29	0.3
Tumor characteristics, n (%)				
Extrathyroidal invasion	2 (6)	1 (8)	1 (9)	0
Lymphovascular invasion	4 (13)	2 (15)	2 (18)	0
Multifocality	12 (39)	5 (38)	4 (36)	4 (67)
Final pathology of malignancy, n (%)				
PTC classical variant	7 (23)	4 (31)	3 (27)	0
PTC follicular variant	19 (63)	6 (46)	7 (64)	6 (100)
PTC diffuse sclerosing variant	2 (7)	2 (15)	0	0
Incidental papillary thyroid microcarcinoma	2 (7)	1 (8)	1 (9)	0
Total PTC	30 (100)	13 (100)	11 (100)	6 (100)

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Discussion

- recent studies have suggested higher rates of underlying malignancy in hyperthyroidism

- lower TSH levels may lead to lessd differentiation of thyroid cells, allowing for higher predisposition to mutations and malignant transformation

- These findings suggest that hyperthyroid patients with concomitant structural nodular disease have higher rates of underlying cancer and more aggressive thyroid cancer histopathology

- The findings support this claim as the toxic solitary nodule, and toxic MNG groups had the highest risk of malignancy at 50% and 24%, respectively

- Specifically, the toxic solitary nodule group had multifocal malignancy in 67% of patients.

- thyroidectomy should be considered as the definitive treatment in this group of patients.

limitations

1. single institution

2. risk for selection bias

3. reviewed retrospectively

4. all patients undergoing thyroidectomy

5. sample size

Conclusion

- Hyperthyroid patients with structural nodular disease had the highest rates of thyroid cancer and displayed higher rates of aggressive tumor histopathology

- workup with ultrasound and FNA to assess the risk of malignancy

- Surgery should be considered as the treatment