

Parsing the rising incidence of thyroid cancer – how are thyroid nodules being found?

A Multinational, Multi-institutional Analysis by the AHNS Endocrine Surgery Section Collaborative

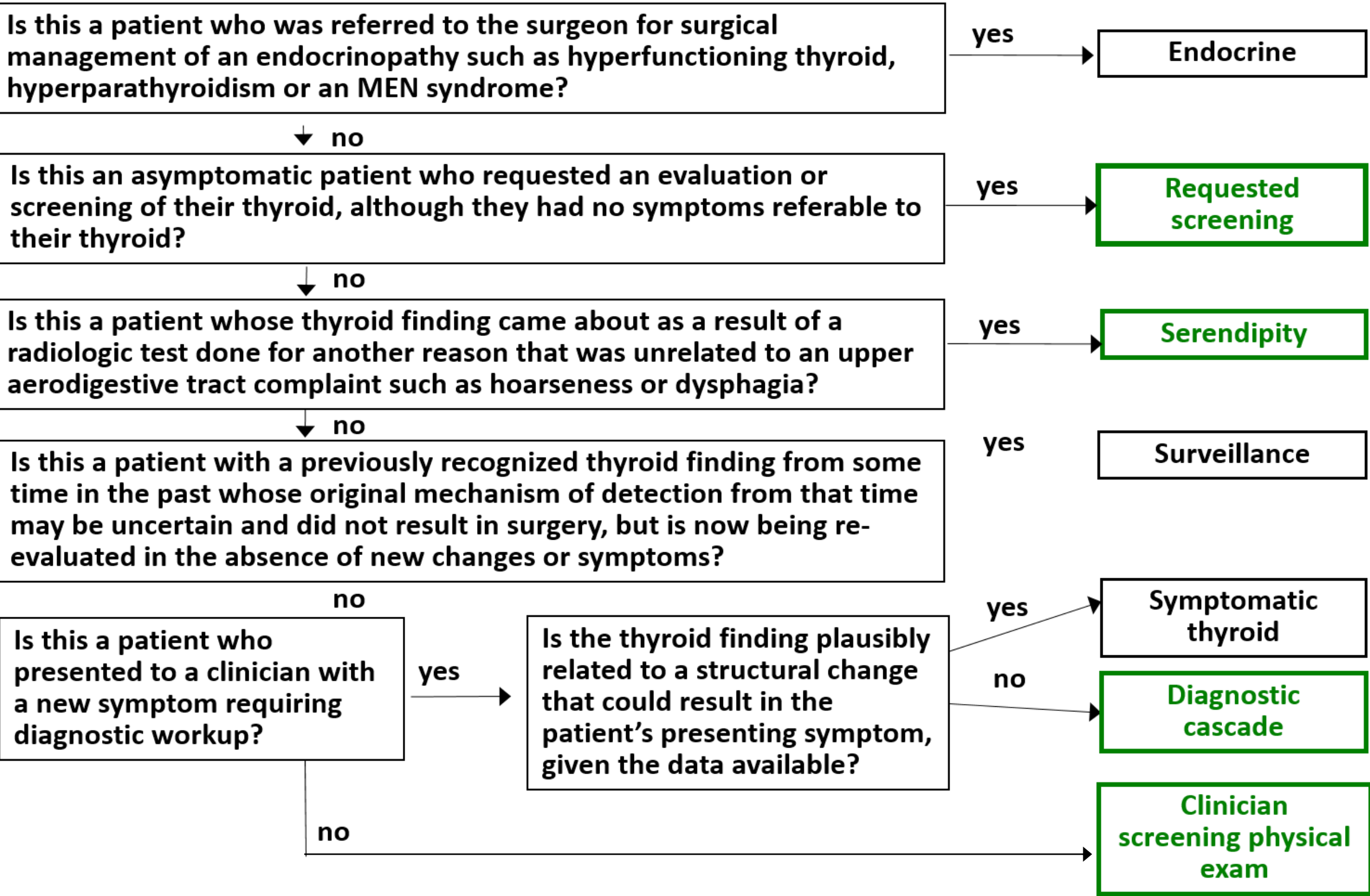
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Background

- The incidence of papillary thyroid cancer has increased worldwide. While much of the increase is acknowledged to be due to the detection of subclinical, asymptomatic cancers, there is concern for a possible concurrent true rise in the incidence¹⁻³
- How cancers come to attention – **their mode of detection** – is an important part of understanding incidence trends – if cancers are primarily coming to attention due to symptoms, this would suggest an increase in the true incidence of thyroid cancer. We aimed to:
 - Characterize how thyroid nodules that ultimately result in surgery come to attention
 - Compare thyroid nodule mode of detection across settings
 - Test whether thyroid cancers discovered by screening/chance differ in size compared to tumors characterized as symptomatic at presentation

Methods

- Multicenter, retrospective study of patients who underwent thyroid-directed surgery. All surgeons affiliated with the American Head and Neck Society (AHNS) Endocrine Section Collaborative were invited to contribute. Data are from 16 centers in 4 countries; US (N=12), Canada (N=4), Denmark (N=1), South Africa (N=1)
- Eligible cases were the first 100 or highest number available consecutive adult patients who underwent thyroidectomy or lobectomy in 2019
- Clinical, operative and pathology reports were examined to capture patient demographics and final pathologic diagnosis. Detailed medical record review was used to identify the mode of detection of the thyroid finding that led to surgery, using an adapted version of a previously validated classification tool⁴– shown below
- Green boxes indicate cases being grouped for analysis as being due to screening or chance detection



Results

Thyroid nodule mode of detection

- A total of 1,328 thyroid surgeries performed in 2019 met the specified inclusion criteria
- Of these, 448 or 34% (95% CI 31-35%) were performed for symptoms that attributable to the thyroid (Table 1)
- 542 out of the total 1,328 cases (40.8%) were performed for thyroid findings discovered by screening or chance (diagnostic cascade, serendipity, requested or clinician screening) (Table 1)
- South Africa and Denmark had highest rates of symptomatic detection, significantly higher than the U.S. and Canada (p<0.001) (Table 2)

Thyroid cancer diagnoses

- Pathologic analysis of the thyroid pathology resulting in surgery revealed thyroid malignancy in 613/1,328 (46%) cases (Table 1)
- Screening or chance was responsible for identification of 310 of 613 (50.6%) cancers while 183 (30%) were discovered secondary to patient symptoms (Figure 1)
- The mean size of carcinomas identified was significantly smaller (p<0.01) in the screening & chance group as compared to the symptomatic group: 2.1cm (range 0.05-8.8) versus 3.2 (range 0.2-10.5)

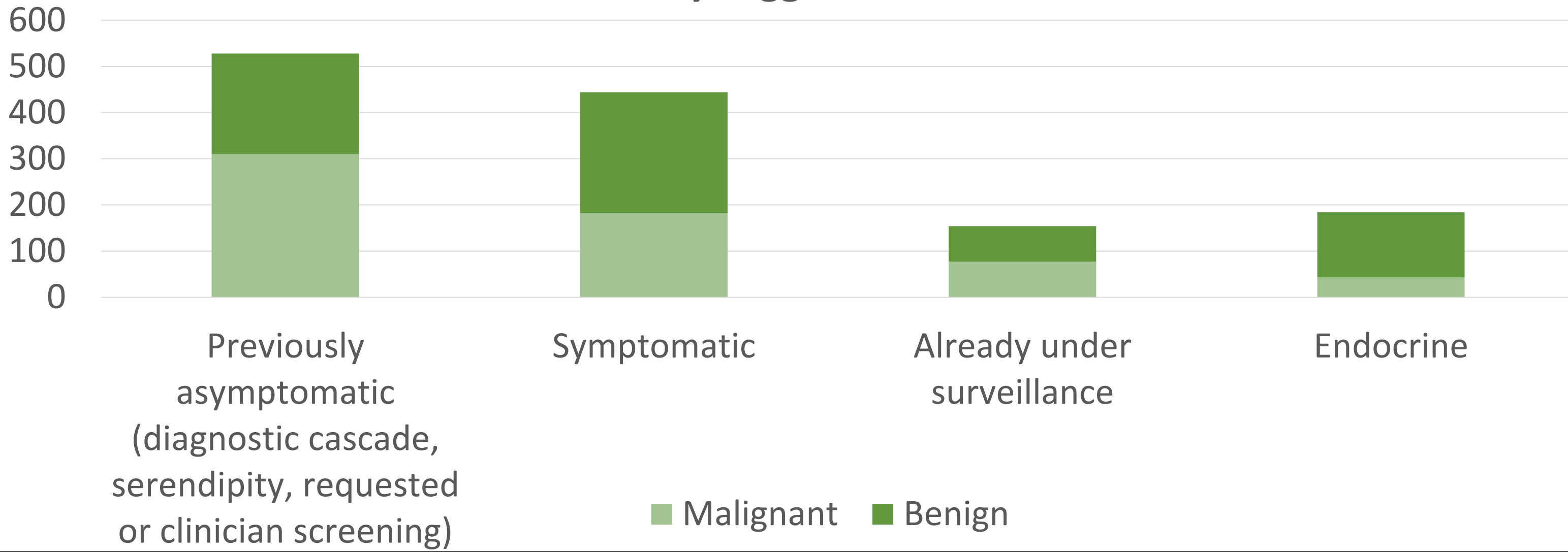
	Total	Endocrine	Requested screening	Serendipity	Surveillance	Symptomatic	Diagnostic cascade	Clinician exam
All	1328	184 (14%)	18 (1%)	270 (20%)	154 (12%)	448 (34%)	77 (6%)	177 (13%)
Age (med), range	52(53), 18-90	50(52), 18-81	45(41), 22-72	57(58), 18-90	51(51), 21-77	51(52), 18-90	52(52), 20-78	49(47), 18-84
Male	335 (25%)	31 (9%)	4 (1%)	102 (30%)	33 (10%)	102 (30%)	28 (8%)	35 (10%)
Female	993 (75%)	153 (15%)	14 (1%)	168 (17%)	121 (12%)	346 (35%)	49 (5%)	142 (14%)
Benign / NIFTP	702 (53%)	141 (20%)	5 (1%)	118 (17%)	77 (11%)	261 (37%)	24 (3%)	76 (11%)
Thyroid Cancer	613 (46%)	43 (7%)	13 (2%)	147 (24%)	77 (13%)	183 (30%)	51 (8%)	99 (16%)

Table 1. Thyroid nodule mode of detection distribution

	Total	Endocrine	Requested screening	Serendipity	Surveillance	Symptomatic	Diagnostic cascade	Clinician exam
All	1328	184 (14%)	18 (1%)	270 (20%)	154 (12%)	448 (34%)	77 (6%)	177 (13%)
U.S.	841 (63%)	135 (16%)	10 (1%)	193 (23%)	94 (11%)	255 (30%)	34 (4%)	120 (14%)
Canada	344 (26%)	35 (10%)	8 (2%)	55 (16%)	59 (17%)	102 (30%)	32 (9%)	53 (15%)
South Africa	53 (4%)	4 (8%)	0 (0%)	2 (4%)	1 (2%)	42 (79%)	3 (6%)	1 (2%)
Denmark	90 (7%)	10 (11%)	0 (0%)	20 (22%)	0 (0%)	49 (54%)	8 (9%)	3 (3%)

Table 2. Thyroid nodule mode of detection by geographic region

Figure 1. Distribution of thyroid cancer diagnosis by trigger event



Discussion

- Only 34% of thyroidectomies performed in 2019 in this sample were for symptomatic thyroid nodules. There were 14% of cases performed related to an endocrinopathy such as Graves’ disease while the remaining 56% were without symptoms.
- Malignancy was found in 46% of thyroid surgeries, nearly half of these were discovered in the absence of symptoms. This is consistent with a recent systematic review/meta-analysis reporting that 49% of thyroid cancers diagnosed were in asymptomatic patients⁵
- More than half (62%) of cancers detected in the asymptomatic group were <2cm
- These findings show that asymptomatic detection continues to be a mainstay for thyroid cancer detection.
- The mean size of carcinomas identified in the symptomatic group was larger than in the asymptomatic group, supporting face validity of the findings.
- These data can be used to identify practice patterns that support optimal identification and management of cancers while limiting overtreatment.

References

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