Evaluation of Thyroid Incidentaloma

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KEYWORDS
- Incidental thyroid nodule
- Thyroid cancer
- Ultrasound
- Fine needle aspiration biopsy

KEY POINTS
- Incidental thyroid nodules are typically nonpalpable thyroid nodules found during radiographic evaluation for a non-thyroid-related issue (eg, computed tomographic scan, positron emission tomography [PET] scan, carotid duplex).
- The prevalence of thyroid incidentalomas ranges from 1.6% to 67% based on the radiographic modality of detection.
- The overall risk of malignancy in the incidental thyroid nodule is approximately 15%, but ranges from 4% to 50% based on the mechanism of identification and other nodule characteristics.
- Incidental thyroid nodules should be referred to an endocrine specialist (endocrine surgeon, endocrinologist, otolaryngologist, or a general surgeon comfortable with thyroid surgery) for proper evaluation.
- Solid thyroid nodules more than 1 cm in size should undergo ultrasound-guided fine-needle aspiration biopsy according to American Thyroid Association guidelines. PET scan and nodules, or nodules less than 1 cm with worrisome ultrasonographic features, should also be “considered for biopsy” because of higher concern for cancer.
- Incidental thyroid nodules are contributing to but are not the sole reason for the rising incidence of thyroid cancer in the United States and other developed nations.

INTRODUCTION
Thyroid nodules are an extremely common endocrine disorder with a generally accepted prevalence of around 4% to 7%. The Framingham study,\(^1\) completed in 1968, demonstrated an overall prevalence of thyroid nodules in the general population of 4.2% (women 6.4%, men 1.5%). The Whickham survey\(^2\) completed in England in 1977 had a similar overall prevalence of 3.7%. A more contemporary study\(^3\) still quotes a prevalence of 3% to 6%. Thus, based on US population data in 2012, up to 12 to 21 million adults may harbor a thyroid nodule. All of these studies are based
on nodules that are considered “palpable.” However, true prevalence of thyroid nodules based on autopsy data can be much higher, ranging from 10% to 60%. The Mayo Clinic study in 1955 (821 consecutive autopsies) demonstrated that up to 50% of patients who underwent autopsy with no history of thyroid disease could be found to have incidental nodular thyroid disease. Modern prevalence studies based on standard radiographic analysis with neck ultrasound (U/S) concur with autopsy data that up to 42% to 67% of patients who undergo neck U/S can be found to have a nonpalpable, incidental thyroid nodule.

A thyroid incidentaloma can be defined as an unsuspected thyroid nodule found on a diagnostic radiographic examination performed for a reason other than “thyroid disease.” Most of these are nonpalpable, but once known may actually be palpable. Because these nonpalpable thyroid nodules can occur in up to 30% to 50% Americans, some endocrinologists have termed the incidental thyroid lesion as a modern day epidemic. Based on US population data from 2012, up to 93 to 156 million people may actually harbor a nonpalpable, incidental thyroid nodule. Therefore, it is important to determine guidelines for the appropriate identification and risk stratification of these nodules to determine adequately which nodules need further examination, biopsy, and surgical evaluation. It is also important to recognize the risk of malignancy in the incidental thyroid nodule and how it varies based on mechanism of identification and radiographic characteristics. Finally, this article puts into perspective the contribution of the incidental thyroid nodule to the rising incidence of thyroid cancer.

DETECTION OF INCIDENTAL THYROID NODULES

Incidental thyroid nodules can be found during multiple different radiographic evaluations, including computed tomographic (CT) scan, positron emission tomography (PET) scan, carotid duplex, and neck U/S. Other less common modalities would include chest radiograph, magnetic resonance imaging, and nuclear medicine tests, such as octreotide or sestamibi scanning. The following case presentations highlight the most common modalities where incidental thyroid nodules are detected.

CT SCAN DETECTION OF INCIDENTAL THYROID NODULES

Case Presentation

A 55-year-old white woman who had a history of surgically resected stage III rectal cancer underwent an annual surveillance CT scan of the chest, abdomen, and pelvis. Upper cuts of the chest revealed what the radiologists described as a “1.5-cm hypodense mass in the right thyroid lobe with smooth borders… likely benign” (Fig. 1A). The patient was then referred for further evaluation. The patient had no prior history of nodular thyroid disease, and she was clinically euthyroid with a thyroid-stimulating hormone (TSH) count of 0.53. She had received radiation treatment to her rectal cancer, but had no history of head, neck, or chest or radiation exposure. There was no family history of thyroid cancer. On detailed physical examination by a dedicated endocrine surgeon, the lesion was palpable and mobile. A dedicated history and physical examination may reveal risk factors for thyroid cancer (Box 1).

An office-based U/S demonstrated a 1.7 × 1.2-cm right thyroid nodule, which had worrisome ultrasonographic features, including hypoechoic appearance compared with surrounding thyroid tissue and irregular borders with evidence of localized invasion into the overlying strap musculature and into surrounding thyroid parenchyma (see Fig. 1B). Based on this, a U/S-guided fine-needle aspiration biopsy (FNABx) of the mass was performed. Cytology demonstrated evidence of papillary thyroid carcinoma. Therefore, the patient underwent total thyroidectomy. At the time of the operation, the
tumor demonstrated local invasion into the overlying sternothyroid musculature (consistent with preoperative U/S) and was resected en bloc with the tumor.

CT scan is a common mechanism for the discovery of incidental thyroid nodules. According to prior studies, 16% of cervical or thoracic CT scans will yield a diagnosis of an incidental thyroid nodule. However, although CT scans are good at detecting thyroid nodules, they have several pitfalls. First, CT can often underestimate the size of nodules. The author’s group has previously published a correlational analysis study comparing CT and U/S measurements of thyroid nodules to final pathologic nodule size after surgical resection. CT scan had a Pearson correlation factor of

Fig. 1. (A) A CT scan demonstrating a 1.5-cm incidentally discovered right thyroid mass (arrow). This scan was read as “benign-appearing.” (B) Office-based thyroid U/S of the same lesion demonstrates a 1.7-cm heterogeneous mass with irregular borders showing local invasion into the overlying sternothyroid musculature (arrow 1) and invasion into surrounding thyroid parenchyma (arrow 2), highly suspicious for malignancy.

<table>
<thead>
<tr>
<th>Box 1 Risk factors for thyroid cancer based on history and physical examination</th>
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<tr>
<td>• Prior personal history of thyroid cancer</td>
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<td>• Family history of thyroid cancer, including papillary and medullary thyroid cancer (multiple endocrine neoplasia syndrome, type IIA and IIB)</td>
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<td>• History of head and neck or upper chest radiation exposure</td>
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<td>• Fixed palpable mass in the thyroid gland</td>
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<td>• Palpable cervical lymphadenopathy in a patient with a thyroid nodule</td>
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<td>• Hoarseness of the voice (representing invasion of the recurrent laryngeal nerve.)</td>
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0.83 with a \( P \) value of .005 to thyroid nodules at final pathology. However, U/S was consistently more accurate with a Pearson correlation \( r^2 \) of 0.90 with a \( P \) value of .0001. Correctly determining the size of the nodule is an important first step in determining which nodules need further evaluation. If American Thyroid Association guidelines\(^\text{12}\) are to be adhered to to biopsy nodules without worrisome ultrasonographic features greater than 1 cm in size, these nodules must be reliably measured.

CT may also overestimate or underestimate the number of thyroid nodules. In a 3-year study (1998–2001), Shetty and colleagues\(^\text{13}\) examined all cervical and thoracic CT scans performed at the Massachusetts General Hospital in Boston. They identified 230 patients with a CT-based thyroid abnormality that subsequently underwent thyroid U/S. They found that CT scan findings agreed with U/S for lesion size only 53% of the time; CT identified the dominant nodule but missed multinodularity 30% of the time and had a false positive identification of a thyroid nodule 4.3% of the time. Another recent review of thyroid incidentalomas by Jin and colleagues\(^\text{14}\) described other limitations of CT, including “CT scans of the chest often do not image the entire thyroid gland” (thus a false negative for nodules may occur), routine CT cuts of 3 to 5 mm may miss lesions, and, during chest CT, “the patient’s arms are positioned over the head, which often results in beam hardening artifacts in the thyroid.” Nonetheless, CT is the most likely radiographic test to detect incidental thyroid nodules.

In regard to CT’s ability to detect malignancy in a thyroid nodule, Shetty and colleagues\(^\text{13}\) found that the overall risk of malignancy based on CT identification of an incidental nodule was 3.9% to 11.3%. (This is similar to the risk of malignancy in a palpable thyroid nodule that is generally quoted at 5%.) When they looked for any risk factors (found by CT scan) that accurately predicted a malignant outcome, the only finding was that malignant nodules were significantly larger (mean 2.79 cm) than benign nodules (mean 2.16 cm) (\( P \) value .03). They also looked at the CT presence of microcalcifications in the nodule. It is well accepted that “ultrasonographically” detected microcalcifications are a worrisome finding that increases the likelihood of malignancy at the time of FNABx. A recent study\(^\text{15}\) of almost 1500 patients with greater than 2000 thyroid nodules found that the sensitivity of “ultrasonographically” discovered microcalcifications for predicting a final pathologic diagnosis of malignancy was 49.6% with a specificity of 93.6%. However, CT scan identification of calcifications does not correlate to a final diagnosis of thyroid cancer with a \( P \) value of .72.\(^\text{13}\) Finally, unlike incidental adrenal nodules, there are no reliable data on absolute Hounsfield Units of an incidental thyroid nodule that correlate to an increased risk of thyroid cancer.\(^\text{14}\)

Therefore, although CT is a common mechanism for detecting incidental thyroid nodules, it is quite limited, by itself, in measuring nodule size accurately, predicting the correct number of thyroid nodules, or assessing for the risk of malignancy. Therefore, it is currently recommended that incidental thyroid nodules discovered on CT scan should undergo a dedicated thyroid U/S and referral to an endocrine specialist (endocrine surgeon, endocrinologist, ENT, or general surgeons with high volume practices of thyroid disease) to determine the next step in nodule evaluation.

Finally, CT scan plays a role in the evaluation of thyroid disease, but should not be used as a “screening tool” for thyroid nodules for many of the reasons listed above. The role of CT scan in thyroid disease is generally confined to (1) evaluation of the extent of substernal goiters for surgical planning (need for sternotomy, intubation risks); (2) assessment of large thyroid cancers suspicious for local invasion into trachea, great vessels, and others, that again may alter surgical planning or extent of resection; (3) staging of thyroid cancer, looking for metastatic disease; and (4) follow-up evaluation of the thyroid bed or lymph nodes after thyroidectomy for cancer (may be used as an adjunct to neck U/S).
Case Presentation

The patient is a 59-year-old woman who recently underwent hysterectomy for endometrial cancer. A staging PET scan was ordered after her recovery that showed no residual disease in the pelvis but intense uptake with a solitary focus in the right thyroid lobe (Fig. 2). The patient had no history of nodular thyroid disease and was biochemically euthyroid with a TSH of 2.3 and a negative anti-thyroid peroxidase (anti-TPO) antibody effectively ruling out Hashimoto thyroiditis. There was no family history of thyroid cancer. She denied history of head, neck, or chest radiation exposure. On physical examination, the nodule was somewhat palpable in the right thyroid lobe. She underwent an office-based thyroid U/S demonstrating a 1.5-cm nodule in the right thyroid lobe as well as a 1.5-cm nodule in the left lobe (nonpalpable and not PET avid) and other subcentimeter nodules scattered throughout the thyroid. The right-sided nodule had irregular borders and microcalcifications suspicious for malignancy. FNABx was performed and yielded a cytologic diagnosis of papillary thyroid carcinoma. The patient underwent a total thyroidectomy. Final pathology demonstrated a 1.5-cm, papillary thyroid carcinoma in the right thyroid lobe. The left-sided nodule was benign.

Fig. 2. Patient with PET and right thyroid nodule (seen to the right of the cross-hairs).
PET scans are commonly performed as cancer surveillance and staging tools. Thus, the finding of an incidental thyroid nodule can be a source of stress for patients already diagnosed with another primary malignancy. Fluorodeoxyglucose or FDG-PET relies on the principle that tissue with a high metabolic demand (cancer, inflammation, infection) will uptake more of the tracer. PET scan uptake patterns for thyroid disease generally come in 2 forms. The first form is diffuse uptake throughout the thyroid gland. This uptake is generally representative of thyroiditis or Graves disease. As such, this pattern generally indicates benign disease of the thyroid. The second pattern of uptake is that of a solitary focus that corresponds to a nodule in the thyroid and raises suspicion for malignancy.

Although the prevalence of incidental thyroid nodules found on CT scan is 16% as outlined above, the prevalence of thyroid nodules discovered on PET scan is much lower. A large meta-analysis \(^1^6\) recently reviewed 22 articles pertaining to PET and thyroid nodules. Of more than 125,000 patients who underwent FDG-PET for varying indications, only 1.6% had a thyroid incidentaloma discovered. Despite the lower overall incidence of thyroid nodules found during PET scan (compared with CT scan), there is much greater concern for malignancy, based on the pattern of tracer uptake. As mentioned above, diffuse uptake on PET scan is much more consistent with benign disease and has been demonstrated in multiple studies, including a large US-based study and a large Korean study that included more than 5000 patients each.\(^1^7\),\(^1^8\) A diffuse uptake pattern only yielded a rate of malignancy of 4.4%, which is again almost identical to palpable nodules at 5%. However, focal uptake has been found to correlate with a cancer rate of 30% to 50% in most studies\(^1^7\)–\(^1^9\) and was 34.8% in the meta-analysis.\(^1^6\)

Our current recommendations for the evaluation of the thyroid incidentaloma detected by PET scan are a detailed history and a physical examination (looking for risk factors for cancer, such as radiation exposure, family history of thyroid cancer), thyroid function testing (including anti-TPO antibody to look for thyroiditis manifesting as diffuse uptake on PET), and a dedicated thyroid U/S with FNABx. The American Thyroid Association guidelines, as mentioned above,\(^1^2\) dictate that nodules greater than 1 cm in size be biopsied. However, they also include a suggestion that lesions less than 1 cm in size with atypical or worrisome characteristics "should be considered" for biopsy. As such, in the setting of an isolated nodule detected by positive PET scan, biopsy can be considered at a size less than 1 cm due to the high risk of malignancy.

### Key points for PET scan detected incidental thyroid nodules

- The prevalence of thyroid incidentalalomas found during PET scan is 1.6%.
- Risk of malignancy in a PET thyroid incidentaloma varies with PET uptake pattern but is highest with a solitary uptake pattern (30%–50%).
- Decreasing the biopsy size threshold for focal PET and thyroid incidentalomas should be considered.

### NECK U/S AND CAROTID DUPLEX SCAN DETECTION OF INCIDENTAL THYROID NODULES

Neck U/Ss are often performed for non-thyroid-related indications, but yield a finding of an incidental thyroid nodule. Neck U/S may be performed for a palpable neck mass, lymphadenopathy, evaluation of parathyroid glands for targeted parathyroidectomy, and vascular access. During these examinations, the thyroid gland is typically
visualized and nodules may be discovered. Prevalence based on the radiology literature quotes a prevalence of thyroid nodules of 42% to 67%. In addition, for patients undergoing a thyroid U/S for a palpable thyroid nodule, up to 48% may have an additional nonpalpable (incidental) nodule seen.

Neck U/S has become a routine part of minimally invasive parathyroidectomy to help localize the culprit gland preoperatively. In patients undergoing neck U/S for parathyroid disease, concomitant thyroid disease can be found in 20% to 56% (see examples in Fig. 3). Biopsy of such nodules can lead to a diagnosis of thyroid nodules that requires or excludes surgical resection. If deemed necessary, the thyroidec- tomy can be performed simultaneously with parathyroidectomy, thus eliminating the need for additional surgery later or “unanticipated” intraoperative discovery of a nodule. Cancer in these lesions has been reported between 2% and 6%.

The proximity of the common carotid artery as it lies just lateral to the thyroid gland also yields a frequent finding of thyroid nodules during carotid artery duplex. In fact, in one study, thyroid nodules were found more frequently (28%) during carotid duplex than a finding of significant carotid stenosis (13%). Steele and colleagues reported an incidence of thyroid cancer of 7.4% in incidental nodules found during carotid duplex. Detection of both lesions (thyroid nodule and carotid stenosis) can facilitate a combined operative approach with both thyroidectomy and carotid endarterectomy (Fig. 4).

Fig. 3. (A, B) Patient with an incidental thyroid nodule discovered during neck U/S for hyperparathyroidism. (A) Right inferior parathyroid adenoma found on neck U/S. Arrow points to hypoechoic extrathyroidal mass, consistent with a parathyroid adenoma. (B) Incidental (nonpalpable) left thyroid nodule in the same patient as (A) (arrow designates 2-cm left upper pole nodule, which underwent biopsy).
The biggest benefit of U/S in its role in the management of the incidental thyroid nodule is not so much its detection of nodules themselves but the follow-up of nodules found on other tests. U/S is the gold standard for the accurate measurement of thyroid nodules. As mentioned above, nodules greater than 1 cm should be biopsied according to American Thyroid Association guidelines; thus, reliable measurements are critical. In addition, U/S can look for features of the nodule that may be more worrisome for malignant potential. Papini and colleagues performed an excellent review of almost 500 incidental thyroid nodules. All patients referred with an incidental nodule subsequently underwent a thyroid U/S and biopsy of nodules greater than 1 cm. Two hundred ninety-five patients had a benign biopsy (no surgery needed); 92 had an inadequate biopsy, and 107 had a biopsy consistent with or suspicious for cancer and went on to surgery. Of the 107 surgical patients, 31 had cancer; 24 had a benign follicular adenoma, and 52 had other benign disease. They then went back and reviewed again the U/S findings of all surgical patients and found several markers on U/S that were more commonly found in malignant versus benign nodules (Table 1). Although these features cannot diagnose or rule out the chance of cancer in a thyroid nodule, they can help point out which nodules are more suspicious and at least heighten the concern to prompt an FNABx for more information. The overall
The rate of cancer found in incidental thyroid nodules, based on U/S in the Papini study, was 8%, but may be as high as 15% in some studies.26

In addition to the 4 U/S characteristics mentioned (hypoechoic lesion, irregular borders, microcalcifications, and central hypervascularity), 2 other U/S characteristics have been investigated to try to determine risk of malignancy in a thyroid nodule. These characteristics include nodule size and shape. Nodule size has been investigated in the past. There has been a great deal of controversy as to nodules broken into lesion size greater than or less than 4 cm in size. Despite multiple studies, the data remain quite controversial. For example, McHenry and colleagues27 demonstrated that thyroid nodules greater than 4 cm actually had a higher rate of being benign as opposed to lesions closer to 3 cm in size. In contrast, Stang and Carty28 showed nodules greater than 4 cm in size may have an increased risk of malignancy. They based this decision on FNABx rates that were more likely to miss cancer; this was thought to be due to sampling error because of the size of the lesion. In the setting of the incidental thyroid nodule where these lesions are typically smaller than 2 cm, size likely has less impact.

Nodule shape has also been shown to predict malignancy. Lesions that are taller than they are wide on U/S can indicate a growth pattern more indicative of cancer than benign disease,29 which is also true for breast lesions imaged on U/S.30

Thus, it can be clearly seen that U/S is critical in the role of evaluating the incidental thyroid nodule. Based on available data, all incidental thyroid nodules, approaching 1 cm in size, regardless of study (CT scan, PET scan, carotid duplex) should undergo a formal thyroid U/S, which can determine the exact size of the lesion. U/S can also determine worrisome structural features that may impact the decision for biopsy and timing of procedures.

Table 1
Ultrasonographic features, malignant versus benign incidental thyroid nodules

<table>
<thead>
<tr>
<th>Ultrasonographic Feature</th>
<th>Malignant (%)</th>
<th>Benign (%)</th>
<th>P value</th>
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<tbody>
<tr>
<td>Hypoechoic</td>
<td>87</td>
<td>56</td>
<td>.009</td>
</tr>
<tr>
<td>Irregular borders</td>
<td>77</td>
<td>15</td>
<td>.0001</td>
</tr>
<tr>
<td>Vascular pattern (central hypervascularity)</td>
<td>74</td>
<td>19</td>
<td>.0001</td>
</tr>
<tr>
<td>Microcalcification</td>
<td>29</td>
<td>4</td>
<td>.0001</td>
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Key points for U/S and duplex detected incidental thyroid nodules

- The prevalence of thyroid nodules found during neck U/S is extremely high at 40% to 67%, with a risk of malignancy of 2% to 15%.
- Risk of malignancy of incidental thyroid nodules found during carotid duplex is 7.4%.
- Neck U/S plays a critical role in evaluating both size and characteristics of incidental thyroid nodules, which may impact the decision for and timing of FNABx.

THE ROLE OF THE INCIDENTAL THYROID NODULE IN THE RISING INCIDENCE OF THYROID CANCER

Thyroid cancer, along with melanoma, is 1 of the 2 most rapidly rising forms of cancer in the United States today.31 In 2002, the American Cancer Society reported a total of 22,500 new cases of thyroid cancer in the United States. By 2012, that number had
more than doubled to 56,460 cases. The bulk of the increase in thyroid cancer is specifically due to the increasing incidence of papillary thyroid carcinoma,32 as seen in Fig. 5.

Several studies have shown that the incidental thyroid nodule contributes greatly to the rising incidence of thyroid cancer. One working theory is that due to increased radiographic surveillance of all types, more and more incidental thyroid cancers are being caught. Davies and Welch33 demonstrated that micropapillary thyroid carcinoma (that is, lesions less than 1 cm in size) accounted for 49% of the rising incidence of thyroid carcinoma in their study. Similarly, Kent and colleagues34 showed that a large percentage of thyroid cancers discovered in the United States today are less than 2 cm in size. They did not specifically classify these as “incidental” versus traditional palpable nodules. Their studies draw to light a question as to whether small incidental thyroid lesions should be considered clinically relevant. Nevertheless, others35 think that the increase in thyroid cancer is real and demonstrated a substantial increase in thyroid cancers larger than 2 cm in size.

This discrepancy prompted the author’s group to do a data analysis of the Surveillance, Epidemiology, and End Results (SEER) database from 1973 to 2006.32 The working theory was that if incidental thyroid nodules are the sole contributor to the rising incidence of thyroid cancer, the bulk of all thyroid cancers should be less than 2 cm in size. Data in Table 2 show that incidental nodules classified as

![Fig. 5. Trends in thyroid cancer incidence in the United States from 1970 to 2006 based on the SEER database. The rising incidence of papillary cancers mirrors and thus accounts for the general rising incidence of thyroid cancer overall.](image-url)
micropapillary cancers (tumors <1 cm) clearly contribute to the overall incidence of thyroid cancer. These microcancers increase the incidence of thyroid cancer by a rate of 19% per year over the 33-year study period. However, tumors of all other sizes (1 cm to >5 cm) are also increasing at a rate of 10.3% to 12.3% per year as well. This finding is evidence that there are other factors also leading to the overall rising incidence of thyroid cancer in developed countries. Factors such as obesity, estrogen levels, increased use of high-resolution CT scan, and other unknown environmental factors are being considered for future research.

SUMMARY

The incidental thyroid nodule is an extremely common entity that has an overall prevalence of 1.6% to 67% depending on the radiographic test that discovered it. The rate of cancer in the traditional “palpable” thyroid nodule is generally accepted to be about 5%. The rate of malignancy in incidental nodules can again be quite variable based on how it was discovered and can range from 4% to 50% (carotid duplex 7%, neck U/S 2%–15%, CT scan 4%–11%, and PET scan 30%–50% in a solitary uptake pattern corresponding to a solitary thyroid nodule).

In 2 studies from the author’s institution, it was found that incidental thyroid nodules (regardless of mechanism of discovery) referred for evaluation harbored a risk of cancer of 15% (consistent with data from Liebeskind and colleagues). Both studies accounted for personal or family history of thyroid cancer and radiation exposure and excluded micropapillary cancer in the final prevalence calculations. (Excluding micropapillary thyroid cancers from data analysis is important because these lesions may often be reported on final pathology reports that are unrelated to the actual “incidental nodule” for which the procedure was being performed. In fact, incidental micropapillary thyroid cancers may be found in up to 13% of all thyroid pathology specimens in the United States.)

After exclusion of such micropapillary cancers, the data still suggest a possible 3-fold increased risk of cancer in incidental nodules compared with the traditional palpable thyroid nodule. As such, incidental thyroid nodules do warrant proper clinical investigation. Because nodules often discovered on CT scan or PET scan can be incorrectly measured, nodules found by this mechanism should be referred for a formal thyroid U/S. Thyroid U/S is considered the gold standard for accurate measurement of thyroid nodules. U/S can also provide additional information as to characteristics of nodules, which may make them more likely to be benign versus malignant. Once solid nodules are found to be greater than 1 cm in size, they should undergo U/S-guided FNABx as currently recommended by American Thyroid Association guidelines. Consideration for biopsy of thyroid nodules less than 1 cm should be restricted to nodules with atypical U/S characteristics and potential nodules that are positive on PET scan due to their higher rate of malignancy. The term “incidental” should not be equated with the term “inconsequential” and, as such, these nodules should be referred to endocrine specialists who can carry out a thorough evaluation to determine malignant potential and proper treatment.

REFERENCES


