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 Unites 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

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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[4] 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.[5,6]

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.[7] 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. 1**A). 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. 1**B). 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