Thyroid Cancer: Incidence on the Rise

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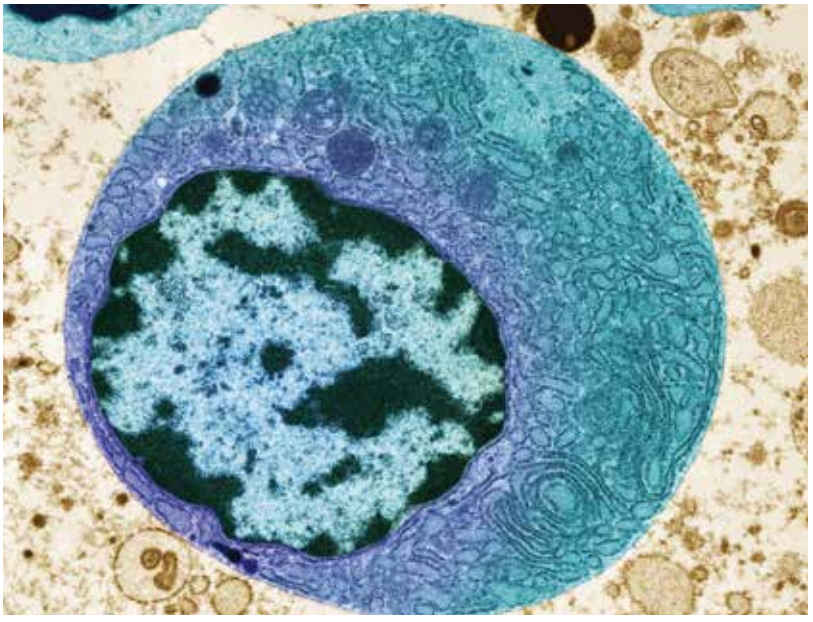

Credit: Steve Gschmeissner / Science Source

Detection of thyroid cancer is widespread, increasing by about 4.5% annually. In the past year, approximately 64,300 new cases were identified. An estimated one in 100 people will be diagnosed with thyroid cancer during their lifetime, making it the eighth most common cancer in the United States.[1]

Incidental thyroid nodules found on carotid ultrasounds and other neck imaging may account for much of the increase; evaluation of these "incidentalomas" may account for the doubling incidence of thyroid cancer cases. (For more on thyroid nodules, see "To Cut or Not to Cut?" *Clinician Reviews*. 2016;26[8]:34-36.) If this pace continues, thyroid cancer may become the third most common cancer among women in the US by 2019.[2]

RISK FACTORS

Generally, women are diagnosed with thyroid cancer more frequently than men.[3] Other risk factors include

- Age (40 to 60 in women; 60 to 80 in men; median age at diagnosis, 51)
- Inherited conditions, such as multiple endocrine neoplasia (MEN) or familial medullary and nonmedullary thyroid carcinoma
- Other cancers, including breast cancer and familial adenomatous polyposis
- Iodine deficiency
- Radiation exposure, particularly head and neck radiation in childhood. This can be through treatment of acne, tinea capitis, enlarged tonsils, or adenoids (usually prior to 1960); treatment of lymphoma, Wilms tumor, or neuroblastoma; or proximity to Chernobyl in 1986.[1,2]

BIOPSY RECOMMENDATIONS

While thyroid nodules are fairly common, only 7% to 15% of nodules are found to be malignant.[2] However, all patients presenting with a palpable thyroid nodule should undergo thyroid ultrasound for further evaluation.

According to American Thyroid Association guidelines, all nodules 2 cm or larger should be evaluated with fine needle aspiration (FNA) due to a concern for metastatic thyroid cancer in larger nodules.[2] Some clinicians prefer to aspirate nodules 1 cm or larger. Nodules that are smaller than 2 cm with sonographic features suspicious for thyroid cancer (see Table 1) should be biopsied.

Nodules that are spongiform in appearance or are completely cystic with no solid components may be monitored without FNA.[2]

TABLE 1
Suspicious Sonographic Features of Thyroid Nodules

Irregular margins (infiltrative, microlobulated, spiculated)	Disrupted rim (eggshell) calcifications
Microcalcifications	Extrathyroidal extension
Tall > wide	Increased vascularity

Source: Haugen et al. *Thyroid*. 2016.[2]

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TABLE 2

10-y Survival, Medullary Thyroid Cancer

Stage I	100%
Stage II	93%
Stage III	71%
Stage IV	21%

Source: American Thyroid Association. *Thyroid.* 2015.[3]

The FNA is typically performed by an endocrinologist under ultrasound guidance. No anesthetic is required, but a topical ethyl chloride spray can assist with patient comfort. Three to four passes are made into the nodule with a 27-gauge needle; most patients describe pressure or a pinching sensation, rather than pain, during the procedure. After the procedure, ice applied to the FNA area may help with patient comfort.

TYPES OF THYROID CANCER

Four possible types of thyroid cancer are identified on pathology after FNA: *papillary*, *follicular*, *medullary*, and *anaplastic*. Differentiated thyroid cancers, which encompass papillary and follicular cancers, are the most commonly diagnosed. Approximately 90% of thyroid cancers fall into this category.[2]

In most cases of differentiated thyroid cancer, patients can be treated with thyroidectomy alone if the cancer remains confined to the thyroid.[2] Just over two-thirds of differentiated thyroid cancer cases are localized in the thyroid. The five-year survival rate for these patients is nearly 100%.[1]

About 27% of differentiated thyroid cancer is also found in neck lymph nodes; these patients may be treated with thyroidectomy and radioactive iodine.[2] The five-year survival rate in these cases is nearly 98%.[1] Chemotherapy is generally not needed for differentiated thyroid cancers.

Medullary thyroid cancer (MTC) is diagnosed in up to 4% of thyroid cancer patients. Characterized by high levels of calcitonin, MTC can be genetically mediated or sporadic. MTC is associated with a variety of RET oncogene mutations; genetic testing of family members is recommended, as well as prophylactic thyroidectomy when high-risk RET oncogenes are detected.[3]

The 10-year survival prognosis for MTC patients varies according to stage at diagnosis (see Table 2). Up to 70% of patients with a palpable MTC nodule present with metastasis consistent with stage III or IV disease.[3]

Medullary thyroid cancer is treated with total thyroidectomy and cervical lymph node dissection. Radioactive iodine has not been proven effective for MTC patients, unless there is also papillary or follicular thyroid cancer present.[3]

Anaplastic thyroid cancer has the highest mortality rate of all types of thyroid cancer. Fortunately, it is relatively rare, occurring in only 1.7% of thyroid cancer patients. The one-year survival rate is 20%, with a median post-diagnosis survival prognosis of approximately five months. Anaplastic thyroid cancer is treated with total thyroidectomy and radical neck dissection when it is considered resectable. Metastatic lesions in the brain or spine are often indicators of unresectable disease. In some cases, external beam radiation therapy is used as palliative treatment.[4]

PEDIATRIC INCIDENCE

Thyroid cancer in children is rare, making up only 1.8% of all pediatric cancers diagnosed in the US annually. Patients are most often between ages 15 and 19, but it is possible for thyroid cancer to manifest in younger patients. Thyroid nodules are more likely to be malignant in children, with a greater incidence of metastatic disease at diagnosis. Prognosis is generally better in children than in adults, however, even with extensive disease.[5]

Children with prior history of other types of cancer treated with radiation, such as Hodgkin lymphoma or leukemia, are at increased risk for thyroid cancer and should be monitored.[5] Children with a family history of MEN or MTC and evidence of RET oncogenes should be monitored starting as early as age 3 with thyroid exam, ultrasound, and measurement of calcitonin levels.[3] Prophylactic thyroidectomy is an option in the first few months of life, depending on the presence of specific RET oncogenes.[3]

CHEMOTHERAPY

Chemotherapy may be helpful for metastatic medullary or anaplastic thyroid cancer, particularly in patients with unresectable disease. Though not usually curative, it may increase progression-free survival time. New chemotherapy agents approved for use in metastatic MTC include cabozantinib and vandetanib.[3] Carboplatin, docetaxel, doxorubicin, and paclitaxel are used in treatment of anaplastic thyroid cancer.[4]

LONG-TERM PATIENT MANAGEMENT

After thyroidectomy and radioactive iodine treatment, follicular

cell cancers (eg, papillary, follicular, anaplastic) are managed by following patients' thyroid-stimulating hormone (TSH), thyroglobulin, and antithyroglobulin antibody levels. A cervical ultrasound is performed to detect possible disease in lymph nodes.[2]

Levothyroxine is dosed to suppress TSH below the recommended levels for hypothyroid patients in order to prevent disease recurrence. Low-risk patients may have TSH suppression below 1 to 2 mU/L, while high-risk patients may be managed with TSH levels below 0.1 mU/L.[2]

Lab levels should be checked annually and a cervical ultrasound performed at six to 12 months, then periodically thereafter depending on patient risk status.[2] Patients with long-term TSH suppression must be monitored for atrial fibrillation and osteoporosis.

Patients who have been treated for medullary thyroid cancer require a different long-term management strategy. Patients should have ultrasound and measurement of TSH as well as calcitonin and carcinoembryonic antigen levels every six to 12 months.[3] TSH suppression is not required; TSH may be maintained at typical euthyroid levels.

A FINAL THOUGHT

For clinicians, it's easy to attempt to minimize thyroid cancer, since the disease is curable for most patients without the burden of chemotherapy and external radiation. However, for a patient, this is still a cancer diagnosis, with the accompanying surgery and required lifelong monitoring. It can be very disruptive to the lives of both patients and their families.

Support groups are available to help patients navigate their new reality. The Thyroid Cancer Survivors' Association **(www.thyca.org)** has resources that may be beneficial to patients (and caregivers) as they learn how to live as a thyroid cancer survivor. **CR**

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