Outpatient Cytopathology® center

TOPICS IN CLINICAL FNA

Aspiration Biopsy Cytology June 2007

THYROID NODULES

In North America, the prevalence of palpable thyroid nodules ranges between 3-7% in the general adult population, and between 0.2-1.8% of the pediatric population. However, with the availability of ultrasound, the detection of thyroid masses has increased dramatically with the prevalence approaching 50%!

Unfortunately, distinguishing benign from malignant thyroid nodules can be difficult. Clinical history, physical examination, routine laboratory, and imaging studies offer no definitive diagnostic features one way or the other. Given that the vast majority of thyroid nodules are benign, routine excision of thyroid masses to rule out thyroid cancer is an unreasonable proposition, exposing an inordinate number of patients to surgical morbidity.

Fine needle aspiration biopsy of thyroid masses, both palpable and non-palpable, has emerged as a rapid, simple means of identifying thyroid cancers. It is a front line diagnostic tool.

In 2006, the American Association of Clinical Endocrinologists published guidelines to help clinicians steer a course through the murky waters of thyroid nodules. Below is a summary from their guidelines and recent literature.

History And Physical Examination
Most patients with thyroid masses, palpable and non-palpable, are asymptomatic. Indeed, many nodules are incidental findings at the time of other studies.

Once a thyroid mass is detected, it is important to obtain pertinent history. Family history is important to exclude any familial patterns such as Cowden's, MEN, or Gardner's syndromes. Previous history of radiation of the head and neck, especially during childhood, and the onset and rate of growth of the thyroid mass should be documented. The location, size and consistency of the nodules, tenderness and associated lymphadenopathy are important to record. Papillary carcinoma frequently metastasizes to regional lymph nodes and a metastasis may be the first presenting symptom.

Thyroid nodules found in young children have a 2-fold increase rate of malignancy. Nodules found in the elderly and/or males should increase your suspicion of cancer. Other factors that also may point to a malignancy are nodules that are fixed, very firm or the patient has persistent hoarseness, dysphagia or dyspnea. Sudden pain may be due to hemorrhage in a cystic nodule. Rapid enlargement of the thyroid gland may suggest an anaplastic carcinoma or lymphoma. If a goiter is substernal, it may cause obstruction of the thoracic inlet that may lead to venous outflow obstruction, and the patient can exhibit prominent neck vessels and flushing.

Imaging Studies
Ultrasound is a very sensitive test, but should not be used as a screening test in the general population due to its low specificity. There are no ultrasound signs that are fully predictive of a malignant lesion. Standard measurements of the entire gland in three dimensions, location and size measurements of the various nodules, and characteristics (solid, cystic, complex), margins, and vascularity should be documented by the ultrasonographer. Previous studies should be compared to the current. If nodules have changed, that is an indication for a FNA. If the lesions are stable, FNA is not needed.

MRI and CT scan should not be used routinely, but may be of value when defining the size and extent of a substernal goiter. Contrast-enhanced CT scans should be avoided as the contrast contains iodine that significantly reduces the uptake of radioiodine for subsequent diagnostic scans and/or therapy.

Fine Needle Aspiration

Approximately 70% of thyroid nodules are benign. This includes colloid nodules, adenomatous nodules cysts, lymphocytic thyroiditis and granulomatous thyroiditis. The most common malignant tumor is papillary carcinoma. Other neoplasms are less frequently seen and include medullary carcinoma, follicular neoplasms, Hurthle neoplasms and anaplastic carcinoma.

Indications for FNA include:

- The patient has a history of neck irradiation.
- MEN syndromes.
- All hypoechoic nodules on ultrasound (with irregular margins and mural nodules).
- A shape that is taller than wide.
- Microcalcifications.
- Nodules greater than 1 cm.

If there is extra-capsular growth, adenopathy, or increased vascularity, a FNA should be performed on the lymph node and thyroid nodule. If a complex nodule is seen, the solid portion should be sampled as well as the fluid component to exclude a cystic papillary carcinoma. The presence of at least two of the above suspicious ultrasound findings reliably identifies most cancers of the thyroid gland in 87 to 93% of cases.

FNA is a safe, accurate and cost-effective method of obtaining cells for diagnostic purposes. The accuracy of FNA when performed by experienced physicians is approximately 95%. No serious adverse effects have been documented and no seeding of tumor cells in the needle track has been reported. The management of the patient should be guided by the results of the FNA and ultrasound.

At the Outpatient Cytopathology Center, we can obtain material from nodules as small as 5-6 mm. If the patient presents with multiple thyroid nodules, the largest are usually biopsied, unless directed otherwise by the clinician or ultrasound findings. If the lesion is cystic and solid, we will sample each area since papillary carcinoma is occasionally cystic. Thyroid scans are rarely used, but we can target specific lesions such as cold nodules.

Repeating the thyroid FNA is occasionally indicated for selected lesions: enlarging nodules, recurrent cysts, thyroid nodule >4 cm, or a mass demonstrating no shrinkage of the nodule after levothyroxine therapy.

If the patient has had thyroid cancer and now has tissue in the surgical bed or in an adjacent enlarged lymph node, thryoglobulin levels can be performed on the FNA material. If positive, the area is then considered recurrent or metastatic thyroid cancer.

Appointments

For further information or to ask questions about a particular patient to determine if the patient is a good candidate for an FNA biopsy, or to schedule an appointment, call the Outpatient Cytopathology Center at 423-283-4734. Our staff will be happy to assist you.

References

Endocrine Practice Vol12#1 Jan/Feb 2006 pages 63-102.

Company Profile

OUTPATIENT CYTOPATHOLOGY CENTER (OCC) is an independent pathology practice that specializes in performing and interpreting fine needle aspiration biopsy specimens. OCC is accredited by the College of American Pathologists. The practice was established in 1991 in Johnson City, Tennessee. Patients may be referred for FNA biopsy of most palpable masses as well as for aspiration of non-palpable breast and thyroid masses that can be visualized by ultrasound. OCC is a participating provider with most insurance plans. Our primary referral area includes patients from Tennessee, Virginia, West Virginia, North Carolina, South Carolina, Kentucky and Georgia.

Dr. Rollins

SUSAN D. ROLLINS, M.D., F.I.A.C. is Board Certified by the American Board of Pathology in Cytopathology, and in Anatomic and Clinical Pathology. Additionally, in 1994 she was inducted as a Fellow in the International Academy of Cytology. She began training under G. Barry Schumann, M.D. at the University of Utah School of Medicine, subsequently completed a fellowship in Cytopathology under Carlos Bedrossian, M.D. at St. Louis University School of Medicine, and has completed a fellowship in Clinical Cytopathology under Torsten Lowhagen, M.D. at the Karolinska Hospital in Stockholm, Sweden. The author of numerous articles in the field of cytopathology, Dr. Rollins also has served as a faculty member for cytopathology courses taught on a national level.

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JANET F. STASTNY, D.O. is Board Certified by the American Board of Pathology in Anatomic Pathology and has specialty boards in Cytopathology. She completed a pathology residency at the University of Cincinnati and subsequently a one-year fellowship in cytopathology and surgical pathology at the Virginia Commonwealth University / Medical College of Virginia. She was on the faculty at the University for 7 years specializing in gynecologic pathology and cytopathology. She has written numerous articles in the field of cytopathology and gynecologic pathology and has taught cytopathology courses at national meetings. She is currently involved on national committees dealing with current issues concerning the practice of cytology.