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Hypodense nodule in right thyroid lobe

Contributed by Amer Heider, MD and Robert Peel, MD Posted online in May 2006 The patient is a 68-year-old woman with a past medical history of acne post neck irradiation at the age of 18, migraine headaches, hypertension and hyperlipidemia, who was found to have an incidental thyroid cyst in the neck ultrasound while undergoing evaluation of her migraine headaches. She was clinically euthyroid and her TSH was 3.05 (normal = 0.35 to 5.5). His family history is negative for endocrine neoplasm. RADIOLOGY: Ultrasound demonstrated 1.4 cm thyroid cyst in the right lobe. CT scans of the neck confirmed the presence of a hypodular right thyroid nodule, measuring 1.5 cm larger, and also demonstrated calcifications in the posterior appearance of the nodule without extracapsular propagation. She subsequently had an ultrasonic-led FNA. FINE NEEDLE ASPIRATION: FNA smears were suspected of papillary thyroid carcinoma; However, an atypical cytological follicular injury, such as a hyalinizing trabecular adenoma, could not be excluded. Therefore, it was recommended to establish a definitive diagnosis based on the histological evaluation of the injury. Subsequently, the patient underwent a total thyroidectomy and central dissection of the compartment node. Intraoperatively, the right lobe was noted to be multinodular diffuse without serious invasion of adjacent structures. The left thyroid lobe was similar in size and shape. GROSS DESCRIPTION: Received was a total thyroid specimen of 11.7 grams (7.0 x 3.5 x 1.5 cm). The outer surface was rubber and tanned red. In a cross section, the carved surface demonstrated two well-circumscribed, solid and different white masses within the middle part of the right lobe, measuring 0.3 x 0.2 x 0.3 cm and 1.2 x 1.0 x 1.0 cm, respectively. The rest of the carved surfaces showed a fluffy, red-tan and multinodular parenchyma. The specimen was submitted entirely for histological examination. It also received a portion of 2.5 x 2.0 x 0.5 cm of lobulated adipose tissue. In dissection, it contained two rubber tanned lymph nodes, 1.0 cm and 0.5 cm, in larger dimensions, respectively. MICROSCOPIC DESCRIPTION: The thyroid's right lobe exhibited two well-circumscribed encapsulated lesions (Figs. 1, 2 and 3). The first injury had a thick fibrous capsule with calcifications, and was composed of large cells with oval nuclei superimposed on round nuclei. Irregular nuclear contours and chromatin clearing were noted. Occasional nuclear pseudo-inclusions and nuclear grooves were also seen. (Figs 4, 5 and 6) The second injury had a thin fibrous capsule and was composed of medium to large cells that formed a trabecular pattern. The cytoplasm of cells it contained a pale perinuclear body with slight yellow tinge. Numerous nuclear pseudo-inclusions and occasional nuclear grooves were noted. The background showed the hyalinization and a Thestroma. (Figs 7, 8, 9, 10, 11, 12, 13 and 14) FINAL DIAGNOSIS ON UPCOMING DIAGNOSTIC CAUSES The thyroid gland is located at the bottom of the neck, below the voice box (larynx) and above the necklaces. A thyroid nodule is a lump in or in the thyroid gland. Thyroid nodules are detected in about 6 percent of women and 1-2 percent of men; occur 10 times more often in the elderly, but are not normally diagnosed. Every time a lump is discovered in thyroid tissue, the possibility of malignancy (cancer) must be taken into account. More than 95 percent of thyroid nodules are benign (not cancerous), but tests are needed to determine whether a nodule is cancerous. Benign nodules include: Multinodular Goiter, also called non-toxic goiter. The word goiter means that the thyroid gland has grown too large. This usually happens when the pituitary gland of the brain creates too much thyroid stimulating hormone. If the goiter is small, the problem can be treated with thyroid hormone pills. Surgery is necessary if the goiter is large or does not stop growing after taking thyroid hormones. A large thyroid gland can press against the trachea (wind pipe) or oesophagus (food tube) and cause difficulties breathing or eating. Benign follicular adenomas. The follicular word means that cells look like a group of small circles under a microscope. If follicular cells are contained inside the nodule, the condition is called benign. If the cells have invaded the surrounding tissue, the diagnosis is cancer. Thyroid cysts are nodules full of liquid. If a nodule has fluid and solid parts, it is called a complex nodule. They should be surgically removed if they cause pain in the neck or hard to swallow. Nodules can be caused by a simple growth of normal thyroid tissue, fluid-filled cysts, inflammation (thyroid) or a tumor (either benign or cancerous). Most nodules were surgically removed until the 1980s. In hindsight, this approach led to many unnecessary operations, as less than 10 percent of the nodules removed turned out to be cancerous. Most of the nodules removed could have simply been observed or treated medically. Chronic thyroiditis (Hashimoto disease) is an inflammation of the thyroid gland that develops slowly. It often leads to a decrease in thyroid function (hypothyroidism). Thyroiditis occurs when the body's immune system destroys cells in the thyroid gland. Chronic thyroiditis is more common in women and people with a family history of thyroid disease. What are the symptoms of thyroid nodules? Many patients with thyroid nodules have no symptoms and are of having a lump in the thyroid gland during a routine physical examination or an imaging study done for uns related reasons. A minority of patients may become aware of a lump slowly on the front of the neck or may experience a vague feeling of pressure or when swallowing. A lump in your neck should be brought to your doctor's attention, even in the absence of symptoms. A thyroid fine needle biopsy is a simple procedure that can be performed in the doctor's office. Some doctors numb the skin on the nodule before the biopsy, but it is not necessary to put to sleep, and patients usually return to work or home afterwards without negative effects. This test provides information that no other test can offer short surgery. A thyroid needle biopsy will provide enough information on which to base a treatment decision more than 85 percent of the time if an ultrasound is used. The use of fine needle biopsy has drastically reduced the number of patients who have undergone unnecessary operations for benign nodules. However, about 10-20 percent of biopsy specimens are interpreted as inconclusive or inappropriate, i.e. the pathologist cannot be sure whether the nodule is cancerous or benign. In these cases, a doctor who has experience with thyroid disease can use other criteria to make a decision on whether to operate. Thyroid scan A thyroid scan is an image of the thyroid gland taken after a small dose of a radioactive isotope normally concentrated by thyroid cells has been injected or swallowed. The scan says if the nodule is hyperfunction (a hot nodule). Because cancer is rarely found in hot nodules, a scan showing a hot nodule eliminates the need for fine needle biopsy. If a hot nodule causes hyperthyroidism, it can be treated with radiiodine or surgery. Neither a thyroid scan nor a radiiodine treatment should ever be given to a pregnant woman. Small amounts of radioactive iodine will be excreted in breast milk. Since radiiodine could permanently damage the baby's thyroid, breastfeeding is not allowed for women undergoing radioiodine treatment. Ultrasound In thyroid ultrasound, high frequency sound waves pass through the skin and are reflected back into the machine to create detailed images of the thyroid. It can display nodules as small as 2-3 millimeters. Ultrasound distinguishes thyroid cysts (liquid-filled nodules) from solid nodules. Recent advances in ultrasound help doctors identify nodules that are more likely to be cancerous. Thyroid ultrasound is also used for the orientation of a fine needle to aspirate to thyroid nodules. The ultrasonic guide allows biopsy doctors the nodule to obtain an adequate amount of material for interpretation. Even when a thyroid biopsy sample is reported as benign, the size of the nodule should be controlled. A thyroid ultrasound examination provides an objective and accurate method for detecting a change in the size of the nodule. A nodule a benign biopsy that is stable or decreasing in size is unlikely to be malignant or require surgical treatment. Most patients who seem to have do not require any specific treatment. Some doctors prescribe the hormone levothyroxine in the hope of preventing the growth of nodules or reducing the size of cold nodules. Radiiodine can be used to treat hot nodules. In a patient with a known thyroid nodule, the initial step is to determine the risk of cancer. High risk factors include: If the injury is benign, the patient is monitored by ultrasound for the growth of the nodule or development of new nodules. If there is growth, another biopsy can be performed. If the injury is malignant, the patient refers to one of the surgeons of the Thyroid Cancer Program for thyroid removal. About 10 percent of the time, the pathologist is unable to provide a diagnosis due to the lack of suction specimens. This suggests an increased risk for malignancy, which may require surgery or follow-up. In most surgeries, the entire thyroid is removed (total thyroidectomy). Lymph nodes can also be removed to determine whether the tumor has spread beyond the thyroid gland. Subsequent therapy depends on the results at the time of surgery. Some patients may be placed in thyroid hormone and followed by blood tests and ultrasound tests, while others will receive radioactive iodine to destroy residual thyroid tissue and then be followed with blood tests and ultrasounds. Using this type of therapy, most cancers will be cured or controlled and less than 20 percent are repeated. In the case of aggressive diseases, a patient can qualify for clinical trials with more recent therapies, such as targeted chemotherapy. Key points A thyroid nodule is a lump in or in the thyroid gland. Thyroid nodules are detected in about 6 percent of women and 1-2 percent of men; occur 10 times more often in the elderly, but are not normally diagnosed. Every time a lump is discovered in thyroid tissue, the possibility of cancer must be taken into account. More than 95 percent of thyroid nodules are benign. Tips to help you get the most out of a visit to your health care provider: know the reason for your visit and what you want to happen. Before your visit, write the questions you want to answer. Bring someone with you to help you ask questions and remember what your supplier tells you. On the visit, type the name of a new diagnosis, and any new medication, treatments, or tests. Also write the new instructions that your supplier gives you. Know why a new drug or treatment is prescribed, and how it will help. Also know what are the side effects. Ask if your condition can be treated in other ways. Know why a test or procedure is recommended and what the results might mean. what to expect if you do not take the drug or have the test or procedure. If you have a follow-up appointment, type the date, time, and purpose of this visit. Know how you can contact your supplier if you have questions. Questions. Questions.