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Anaplastic Thyroid Carcinoma Arising From a Calcified Thyroid Mass

A 68-year-old female presented for follow-up of a dense calcified mass in the right thyroid with a 3-year history. An ultrasound (US) of the affected thyroid demonstrated a newly-developed hypoechoic area (Fig 1, arrows) at the low portion of the calcified thyroid mass with multiple cervical lymphadenopathies (Fig 2) on the right side. Three years prior, a neck US incidentally detected a dense calcified mass in the right thyroid (Fig 3, arrows) without evidence of pathologic lymphadenopathy. At that time, the cytologic result of the calcified mass obtained using US-guided fine-needle aspiration biopsy was nondiagnostic. At the most recent follow-up, however, fine-needle aspiration biopsy of the newly-developed hypoechoic area revealed papillary carcinoma. Subsequent total thyroidectomy with bilateral neck dissection was performed. The specimen was an ill-defined lesion showing thick irregular fibrosis (blue arrows) and calcifications (yellow arrows) with a conventional papillary carcinoma area (black arrows) and solid infiltrative area (Fig 4; ×12.5). The solid infiltrative area revealed highly atypical cells with polygonal or spindle and polymorphic cytoplasm and bizarre nuclei with prominent eosinophilic nucleoli (Fig 5; ×200), suggesting anaplastic transformation. After 3 months, the patient complained of palpable neck nodes. The patient underwent fluorodeoxyglucose positron emission tomography/computed tomography to evaluate the metastasis. Multiple hypermetabolic lesions were detected on the lungs, heart, neck, liver, and in the skeletal systems (Fig 6, arrows) on positron emission tomography/computed tomography. She died of an upper respiratory infection 6 months after the operation.

Though anaplastic thyroid carcinomas account for only 1.6% of primary malignant thyroid neoplasms,[1] they are the most aggressive malignancies known and have a poor prognosis and clinical outcome.[2-5] An anaplastic thyroid carcinoma is usually fatal with a median survival of 3 to 9 months, and only 10% to 15% of patients survive 2 years. It is characterized by a rapid rate of local growth and a high propensity for metastasis at initial presentation and during its accelerated course.[6] The rapidly fatal disease course that is commonly observed in individuals diagnosed with anaplastic thyroid cancer is in dramatic contrast to the excellent prognosis of individuals diagnosed with differentiated thyroid cancer. An anaplastic thyroid carcinoma may arise in some cases from preexisting differentiated thyroid cancer.[7] Anaplastic transformation or the intratumoral evolution of anaplastic carcinoma from preexisting differentiated thyroid cancer has become a well-accepted process, despite a limited understanding of its underlying mechanisms.[4,6] It can be considered a part of the natural history of an untreated differentiated thyroid carcinoma. Fine-needle aspiration

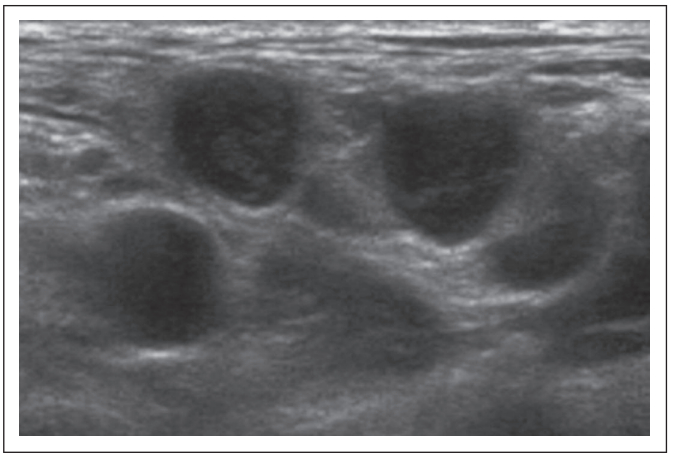

Fig 2.

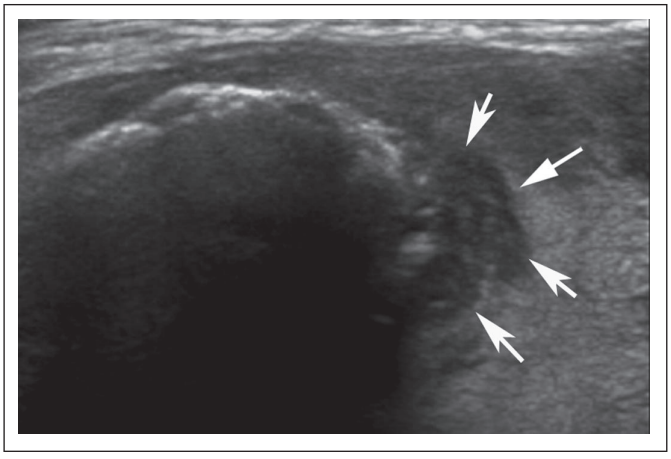

Fig 1.

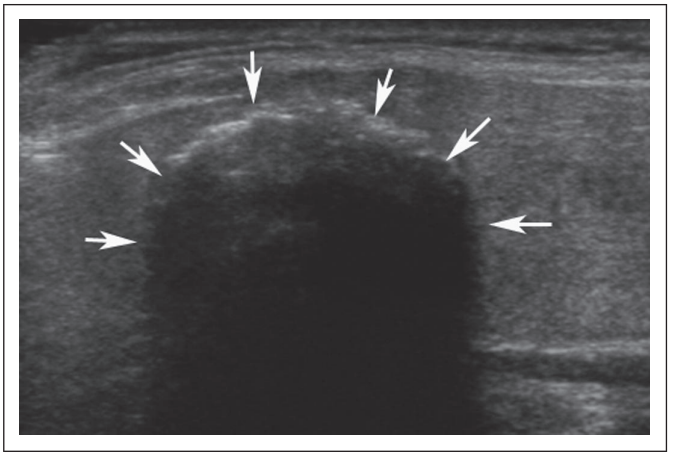

Fig 3.

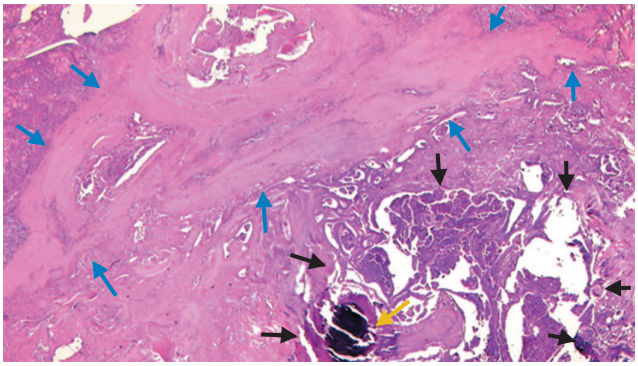

Fig 4.

biopsy is the gold standard for diagnosis of a thyroid nodule. It has a sensitivity of 71% to 93% and a specificity of 96%.[7,8] However, FNAC has a false negative rate of 11% to 25%, and 5% to 30% of results were unsatisfactory or nondiagnostic.[9,10] In our case, the initial US-guided fine-needle aspiration biopsy revealed a nondiagnostic result. The clinician opted for a strategy of only observing the mass until any change occurred. After 3 years of follow-up investigation, the radiologist found a new soft tissue portion at the inferior margin of the calcified mass. Finally, papillary carcinoma was confirmed when US-guided needle aspiration biopsy was performed by targeting the soft tissue component. Cytology of the newly-developed soft tissue area arising from the long-standing calcified mass was the key to diagnosis of this case. In our case, the dense calcified mass did not change for 3 years. Although the calcified thyroid mass was not confirmed as malignancy at the initial examination, the mass might have been a well-differentiated papillary thyroid carcinoma. Anaplastic transformation, as a stage of thyroid tumorigenesis, may develop from this long-standing well-differentiated papillary carcinoma. In summary, an anaplastic thyroid carcinoma is a rare but very aggressive malignancy, and it can evolve from a pre-existing well-differentiated papillary thyroid carcinoma as a coarse calcified mass. Therefore, when new soft tissue mass from a long-stable calcified thyroid mass is detected, a prompt cytologic examination should be performed.

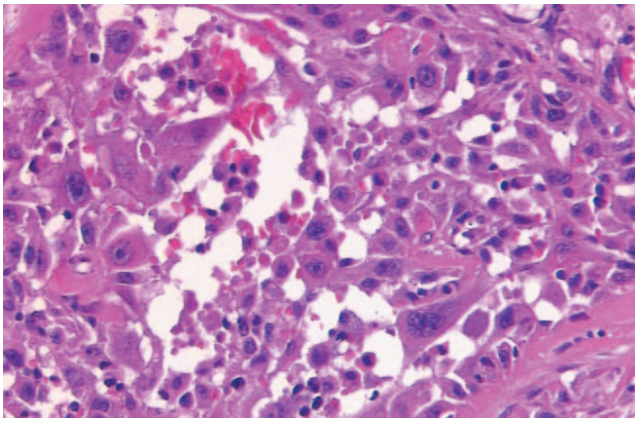

Fig 5.

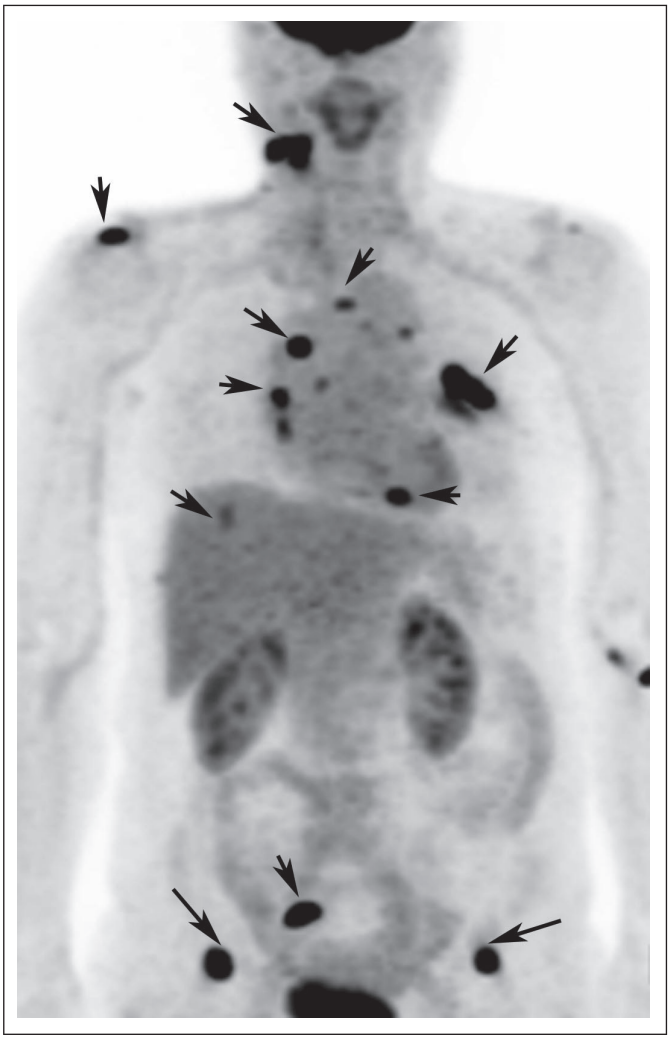

Fig 6.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

The author(s) indicated no potential conflicts of interest.

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Capecitabine-Induced Coronary Vasospasm

A 38-year-old woman with a history of hyperlipidemia and breast cancer was hospitalized after undergoing an exercise stress echocardiogram, which was markedly positive for ischemia. The patient reported a strong family history of premature coronary artery disease (CAD). She denied smoking and admitted to social use of alcohol. Five years before the current events, ductal carcinoma in situ was treated with lumpectomy, radiation therapy, and chemotherapy with cyclophosphamide, paclitaxel, and doxorubicin (a total dose of 240 mg/m^2), which she tolerated without any apparent cardiac toxicity. Two months prior to the stress test, a recurrence of cancer in the lumpectomy bed was detected. She underwent bilateral mastectomy with reconstruction, and adjuvant oral capecitabine therapy was initiated at 3500 mg daily. A few days after beginning capecitabine, she noted dyspnea, lightheadedness, and palpitations with mild exertion, and was no longer able to tolerate her usual high-intensity workouts. She was referred for an echocardiographic stress test. Her resting electrocardiogram (ECG) was normal (Fig 1A). The resting ECG (Fig 1: Apical four-chamber view of the left ventricle; 1B, diastole; and 1C, systole) demonstrated normal cardiac function with left ventricular ejection fraction of 64%. The patient exercised on a treadmill using the Bruce Protocol for 5 minutes and 18 seconds attaining a peak workload of seven metabolic equivalent units (METs). The heart rate quickly rose from 62 to 171 (93% predicted heart rate). She

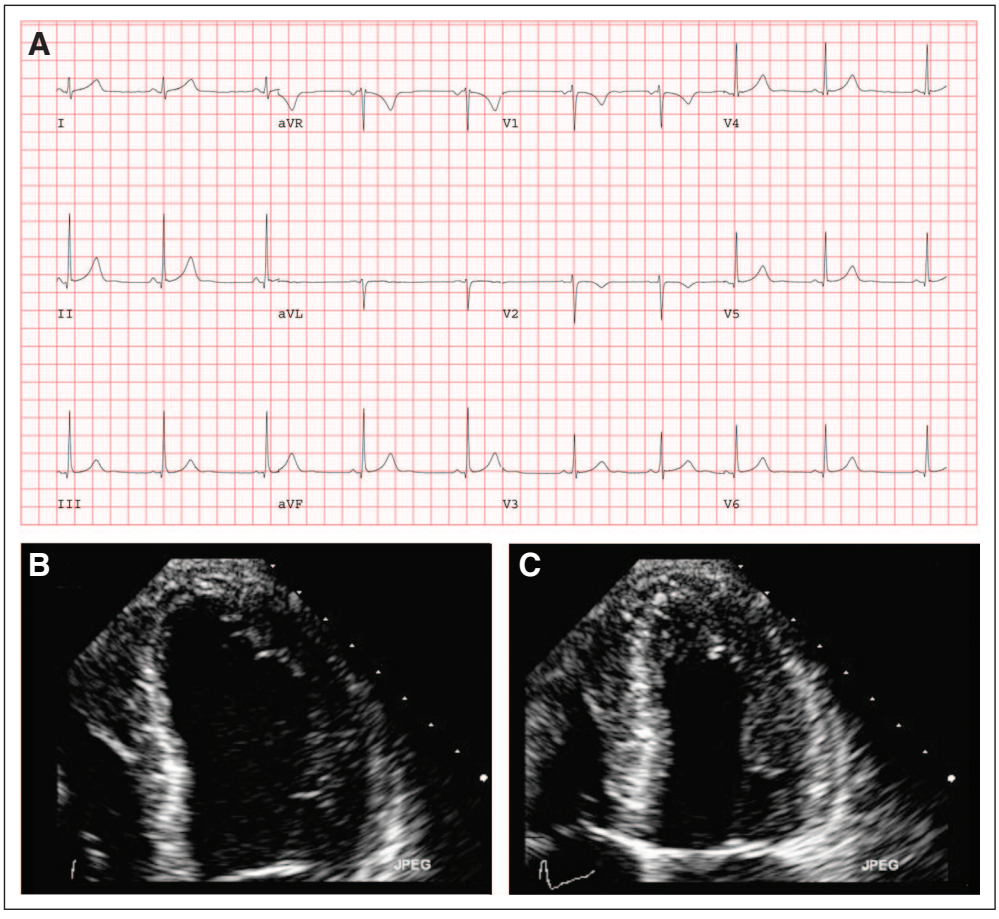

Fig 1.

