Clinical Image

Multinodular goiter in a patient with a history of renal cell carcinoma

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A 77-year-old male presented with a large left neck mass and neck tightness for two years. Eighteen months before presentation, cervical spine MRI for radiculopathy had noted goiter with large, heterogeneously T2-hyperintense nodules in the middle and superior left thyroid [Figure 1A, #].

Figure 1. Images of the patient’s thyroid by three modalities. A) Axial view on MRI T2 protocol showed a large left thyroid nodule with a high T2 signal (#). B) Long-axis view on ultrasound showed benign features of the larger left thyroid nodule in the middle and superior poles (#). C) The transverse view on ultrasound showed benign features of the smaller left thyroid nodule in the inferior pole (*). D) The coronal view on CT with contrast showed heterogeneous enhancement of the larger left thyroid nodule in the middle and superior poles (#). E) The coronal view on CT with contrast showed hypoenhancement of the smaller left thyroid nodule in the inferior pole (*). F) Axial view on CT with contrast showed hypoenhancement of the smaller left thyroid nodule in the inferior pole (*).
The MRI did not visualize the inferior part of the thyroid. Two months later, a thyroid ultrasound found a multinodular goiter with two dominant nodules in the left lobe: a 47-mm one occupying the superior and middle sections (#), and a 34-mm one in the inferior section (*). Both nodules were heterogeneously hypoechoic, complex but predominantly solid, and without calcifications or color Doppler flow [Figure 1B and 1C]: the ultrasound features were consistent with a very low suspicion pattern for thyroid cancer by the American Thyroid Association (ATA) 2015 category. Both nodules were biopsied due to the large sizes by fine-needle aspiration two months later; cytology of the biopsied materials showed benign colloid nodules. His past medical history was significant for resistant hypertension, renal cell carcinoma (RCC) and left nephrectomy 17 years before, and a stable, exophytic, 1.8-cm mass in the right kidney first identified 18 months before the current presentation. To further examine the mass, neck CT was performed which showed a large multinodular goiter with two dominant nodules in the left lobe [Figure 1D and 1E], similar to those found on ultrasound, and did not find any other masses in the neck; the larger nodule demonstrated heterogeneous enhancement [Figure 1D, #] but the smaller one was hypoenhancing [Figure 1E and 1F, *]. TSH was 2.1 mIU/mL (range 0.3 - 4.7). So, what was the diagnosis of the neck mass?

Answer: multinodular goiter with metastatic RCC. To alleviate the neck tightness, he underwent left hemithyroidectomy two months after the presentation. Gross and histological examination of the surgical specimen found multinodular hyperplasia in the background thyroid and a 34-mm clear cell RCC in the inferior part. Metastatic lesions in the thyroid are generally rare; RCC is the most common metastatic thyroid lesion found in clinical practice [1]. RCC thyroid metastasis usually occurs in old patients, with a solitary lesion, and in a metachronous manner with an average 10-year lag time from the original diagnosis of RCC, as seen in this patient [2]. Due to its rarity, preoperative diagnosis of RCC thyroid metastasis can be challenging. Although ultrasound features of RCC thyroid metastasis are reported to be the irregular border, intra-tumoral vascularity, and tumor thrombus in the vein, those features are not common [3]. In this patient, neither ultrasound nor CT suggested the possibility of malignancy or metastasis and even biopsy missed the RCC diagnosis. In retrospect, the hypoenhancement on CT might be the only clue of a nodule with low iodine avidity, but even that is non-specific [4]. This case reminds us that RCC thyroid metastasis can be easily overlooked during the evaluation of thyroid nodules, and it should be in the differential diagnosis of any old patients with a history of RCC.

Conflict of interest

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References