Synchronous primary hyperparathyroidism, follicular thyroid carcinoma, and papillary thyroid carcinoma

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To the Editor: The co-existence of primary hyperparathyroidism (pHPT) and nonmedullary thyroid carcinoma (NMTC) has been reported occasionally since 1956;[1,2] meanwhile, the synchronous occurrence of pHPT and two distinct tumors (follicular and papillary thyroid carcinoma) has rarely been reported. Here, we report the case of a 66-year-old female patient who was transferred to a surgery specialist with the complaints of pHPT and two distinct carcinomas. The patient was admitted to the Department of Endocrinology and Metabolism in our hospital on May 21, 2018 because of an elevation of serum calcium level at 2.80 mmol/L (reference range 2.08–2.60 mmol/L). Laboratory examinations revealed that the parathyroid hormone (PTH) level was 111.4 ng/L (reference range 15–65 ng/L), which suggested the diagnosis of pHPT. However, the patient had no symptoms suggestive of hypercalcemia such as generalized weakness or nausea. Subsequent single-photon emission computed tomography (SPECT) in combination with computed tomography (CT) was performed. Both early- and late-phase images showed enhanced focal retention of Tc–99m MIBI located at the middle-upper part of the right thyroid lobe, and the abnormal signal accumulation was localized specifically at the middle-upper part of the dorsal right thyroid lobe by the fusion imaging of SPECT/CT, which suggested the existence of right-sided parathyroid adenoma [Figure 1A]. The patient provided no significant medical history and family history associated with multiple endocrine adenomatosis (MEN), and her CT scan of adrenal areas and cranial magnetic resonance imaging (MRI) scan demonstrated no obvious abnormality, therefore ruling out the possibility of MEN. Radionuclide bone imaging was also performed, and no abnormity was found. The patient then received ultrasound examination and a right-side parathyroid adenoma and bilateral solid thyroid nodules were detected [Figure 1B and 1C]. Fine-needle aspiration cytology (FNAC) was performed under the guidance of ultrasound, and the pathological result indicated the co-existence of lymphocytic thyroiditis, follicular neoplasm, and epithelial papillary hyperplasia. Subsequently, the patient was transferred to the general surgery department for the surgical treatment of right parathyroidectomy and bilateral total thyroidectomy. Pathological diagnosis of the surgical specimens revealed bilateral multinodular goiter, left-sided thyroid adenoma, right-sided thyroid follicular carcinoma (with capsular microinvasion, $1.2 \times 1.0 \times 1.0$ cm) [Figure 1D], papillary microcarcinoma ($0.5 \times 0.4 \times 0.3$ cm) [Figure 1E and 1F], and a parathyroid adenoma. Her post-operative serum calcium level decreased to 2.2 mmol/L, and the patient was discharged 4 days after surgery.

To our knowledge, the co-existence of pHPT and two different thyroid carcinoma (medullary and papillary thyroid carcinoma) was firstly described in 2014,[3] but no case of pHPT in addition to follicular and papillary thyroid carcinoma has been reported previously. In our case, thyroid ultrasound, FNAC of nodules, and SPECT/CT examinations enabled accurate pre-operative detection of both lesions, and these lesions were managed with a single surgical procedure eventually. Whether these two pathologies occur co-incidentally or for some other reasons remains undetermined, but it is known for certain that the co-morbidity rate of pHPT and NMTC is higher than the incidence rate of either pHPT or NMTC.[4,5] Therefore, screening patients with thyroid nodules for pHPT and patients with pHPT for thyroid nodules and determining the pathological patterns may have certain clinical significance. Thyroid ultrasound is an inexpensive, non-invasive, and recommendable examination to detect thyroid nodules. In conclusion, we recommend careful and thorough examination of the patients with both pHPT and thyroid nodules before parathyroidectomy to avoid missing concurrent thyroid carcinoma and re-operation.

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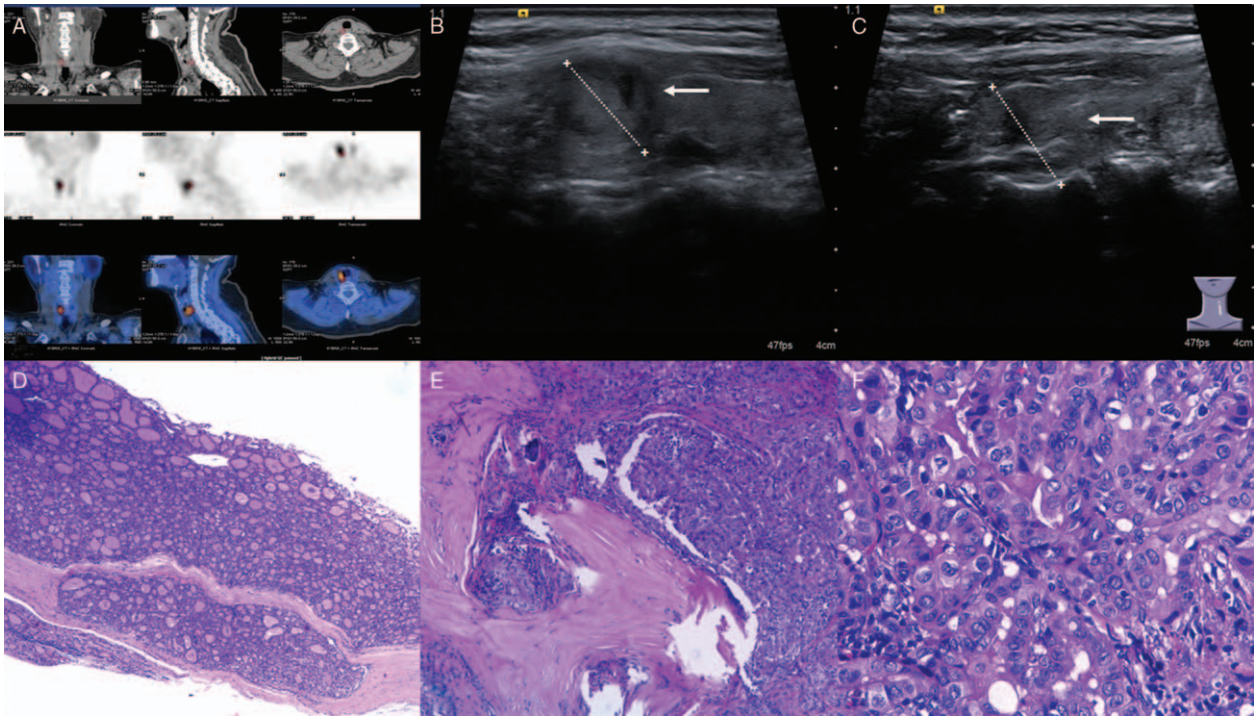

Figure 1: Synchronous primary hyperparathyroidism, follicular thyroid carcinoma, and papillary thyroid carcinoma in a 66-year-old female. (A) CT, SPECT, and fusion SPECT/CT images of parathyroid adenoma; (B) ultrasound image of right thyroid lobe; (C) ultrasound image of left thyroid lobe; (D) a nidus of follicular carcinoma located in the right thyroid lobe. (H&E staining; original magnification, ×40); (E) a nidus of papillary carcinoma located in the right thyroid lobe (H&E staining; original magnification, ×100), and (F) the specific cellular morphology of papillary carcinoma (cuboidal cells with enlarged, overlapping nuclei, and clearing chromatin, H&E staining; original magnification, ×400). CT: computed tomography; SPECT: single-photon emission computed tomography.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflicts of interest

None.

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