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Pathology Page

Mixed medullary and papillary carcinoma of the thyroid: A case report

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A 53-year-old woman with a history of hypertension and right breast cancer status after mastectomy presented with progressive swelling of the neck in May 2013. She had no family history of medullary thyroid carcinoma (MTC), hyperparathyroidism, or pheochromocytoma. On physical examination, a soft, elastic, 2-cm nodule was palpated on the left side of the neck. The serum levels of thyroid stimulating hormone and free thyroxine were normal. Ultrasonography showed an isoechoic irregular 8.3 mm × 7.6 mm × 5.8 mm nodule in the right lobe of the thyroid, and a hypoechoic heterogeneous 19.2 mm × 18.7 mm × 14.0 mm nodule in the left lobe. Fine-needle aspiration cytology of the left lobe nodule revealed scattered atypical cells. Based on the atypical clinical features and patient request, a radical thyroidectomy and central neck lymph node dissection were performed. During the operation, the left thyroid nodule was found to have invaded the strap muscles. An intraoperative pathology consultation on the left thyroid nodule was deferred owing to diagnostic difficulty. After the operation, the patient was discharged without complications.

Macroscopically, the right thyroid lobe measured 4.5 cm × 3 cm × 1.5 cm, and the left lobe measured 5.5 cm × 3.0 cm × 2.5 cm. After serial sections, a gray white soft tumor mass, about 2.4 cm in diameter, was noted in the left-side thyroid parenchyma, and the right side of the thyroid showed vague goiter-like tan brown nodules.

A microscopic examination of the left-side thyroid tumor revealed one partially encapsulated nodular tumor composed of solid sheets and follicles of neoplastic cells that were round to polygonal, with large nucleoli, granular cytoplasm, and medium-sized nuclei, separated by hyalinized collagen (Fig. 1A, hematoxylin and eosin × 40; Fig. 1B, hematoxylin and eosin × 400). Foci of calcification, atypical mitoses, and angioinvasion were noted. Amyloid deposition in the fibrous stroma was proven by Congo red staining under a polarizer. Immunochemical assays showed that the neoplastic cells expressed calcitonin (Fig. 1C, ×200), TTF-1, synaptophysin, chromogranin A, and CD56, and failed to express HBME-1 and cytokeratin 19. The features above were consistent with medullary carcinoma. The two dissected lymph nodes were negative for metastatic carcinoma. The histological results from the right side of the thyroid showed three small foci (up to 3 mm in diameter) of papillary microcarcinoma composed of tumor cells arranged in papillary patterns with ground-glass nuclei and nuclear grooves (Fig. 1D, hematoxylin and eosin ×200).

Papillary thyroid carcinoma (PTC) is the most common histologic type of thyroid carcinoma, accounting for 85–90% of all thyroid cancers [1]. MTCs comprise 5–10% of all thyroid carcinomas [2], which differ from PTC in terms of their cell origin, histopathological features, and clinical management. Mixed medullary and papillary carcinoma of the thyroid has been documented in the literature. Machens and Dralle [3] reported that the prevalence of simultaneous medullary and papillary thyroid carcinomas in patients with PTC was about 2.6%, although the true prevalence is unknown. The exact pathogenesis of two distinct types of thyroid carcinoma in a thyroid gland is still controversial, but it has been hypothesized that they derive from a common tumorigenic pathway [4] or are coincidental findings with different genetic origins [5–7]. In our case, the MTC and PTC components were identified in different thyroid lobes. This suggests independent tumors and supports the theory of a coincidental event, although there was no genetic analysis.

The prognosis for a patient with these mixed thyroid carcinomas is unclear because most reports in the literature are case reports and long-term overall survival results are limited. Patients with MTC have a worse prognosis than patients with PTC [8]. Therefore, long-term follow-up of patients with mixed medullary–papillary carcinomas of the thyroid is mandatory.

Conflict of interest: none.

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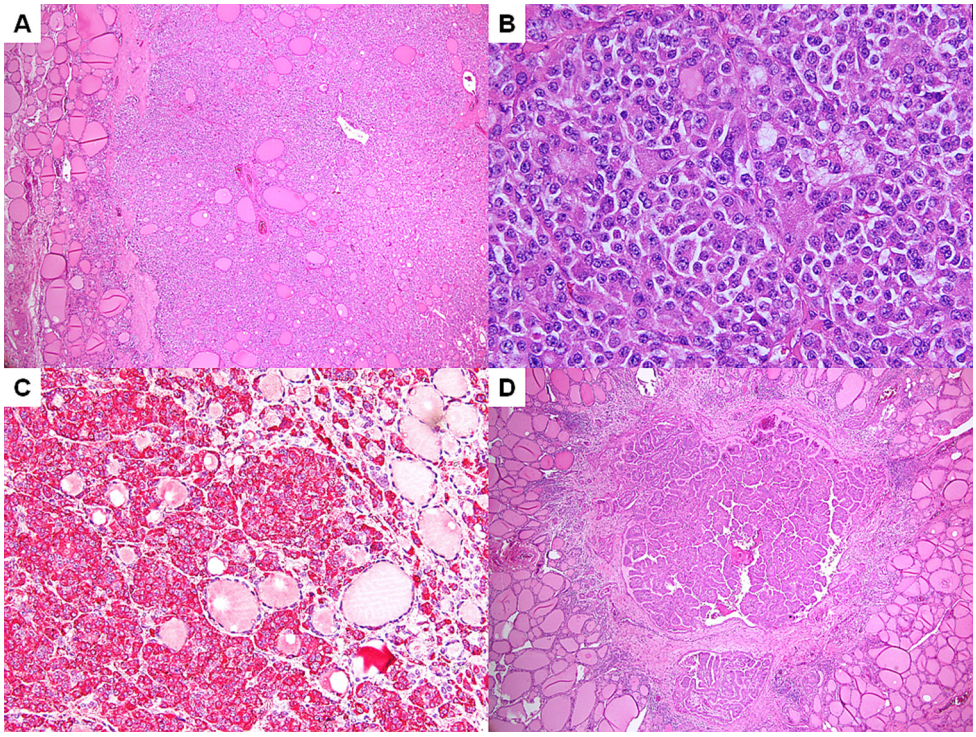

Fig. 1. (A) There is one partially encapsulated nodular tumor composed of solid sheets and follicles of neoplastic cells in the left side of the thyroid (hematoxylin and eosin ×40). (B) The neoplastic cells are round to polygonal, with large nucleoli, granular cytoplasm, and medium-sized nuclei (hematoxylin and eosin ×400). (C) Immunochemical assay shows the neoplastic cells express calcitonin (×200). (D) Histological results of the right side of the thyroid show three small foci (up to 3 mm in diameter) of papillary microcarcinoma composed of tumor cells arranged in papillary patterns with ground-glass nuclei and nuclear grooves (hematoxylin and eosin ×200).

Further reading

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