HATRICK—Synchronous Triple Primary Tumors of Thyroid

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Abstract

Multiple primary cancer (MPC) has an incidence of 1.8% and is defined as having two or more cancers in a single patient. Synchronous tumors are defined as ≥ 2 primary tumors occurring within 6 months of diagnosis of the first primary tumor. We present a case of a 27-year-old female patient who presented with a painless, gradually progressive right-sided neck swelling for the last 1 year with no systemic complaints. Examination revealed a 4×3 -cm, firm, smooth surfaced swelling on right lobe of thyroid. USG neck showed a hypoechoic solid nodule on the right lobe and the left lobe was normal. FNAC showed features of adenomatous colloid nodule, Bethesda II. Right hemithyroidectomy specimen revealed evidence of triple tumors—not otherwise-specified (NOS) tumor, papillary carcinoma thyroid, and medullary carcinoma thyroid, which was confirmed with positivity on IHC with synaptophysin, CEA, and chromogranin. Concurrent appearance of NOS, PTC, and medullary carcinoma thyroid in the very same patient is extremely rare and has not been previously reported in the English literature.

Keywords Triple thyroid tumor · Not otherwise specified (NOS) · Papillary thyroid carcinoma (PTC) · Medullary carcinoma thyroid

Introduction

Thyroid cancer accounts for about 1% of all cancers. Papillary thyroid cancer (PTC) and follicular thyroid carcinoma (FTC) account for 70–90 and 15% of all thyroid cancers, respectively [1]. Medullary thyroid carcinoma accounts for only 5–8% of thyroid cancers. Occasionally, PTC coexists with FTC. The simultaneous occurrence of different types of thyroid carcinomas in the same patient is an unusual event.

Case Report

A 27-year-old female presented to the out-patient department with complaints of a painless, gradually progressive right-sided neck swelling for the last 1 year. There was no history of any pressure symptoms, other swellings in the neck, or any systemic complaints. She also had no hyper or hypothyroid symptoms. Past history was unremarkable and family history was non-contributory. Last child birth was 2 years back, full-term normal vaginal delivery, and was still lactating. On examination, vitals were within normal limits. Local examination revealed a non-tender, 4×3 -cm, firm, smooth surfaced swelling which moved with deglutition on right side of neck. The lower border was palpable and carotid pulsations were felt and were normal in position. There were no swellings on the left side or elsewhere in the neck. The serum values are TSH = 1.287 MIU/L, T3 = 2.96 ng/ml, and T4 = 1.29 μ g/dl and the serum calcium was 8.8 mg/dl. USG neck showed a 3.8×2.4 -cm hypoechoic solid nodule with small cystic areas with mild increase in vascularity in the lower part of right lobe with the left lobe and isthmus being normal. FNAC showed

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Fig. 1 First nodule—encapsulated, composed of microfollicles with scanty colloid and cells with vesicular nuclei, mild pleomorphism, with features suggestive of capsular invasion-not otherwise-specified tumor

features of adenomatous colloid nodule, Bethesda II. She was then taken up for a right hemithyroidectomy under general anesthesia. Histopathology revealed three malignancies, in the same lobe of thyroid—first, well-differentiated, not otherwise-specified (NOS), with capsular invasion and nuclear clearing (Fig. 1); second, papillary carcinoma in background of Hashimoto's thyroiditis with no invasion (Fig. 2); and third, medullary carcinoma (Fig. 3). The confirmation of medullary carcinoma was made on IHC, where synaptophysin (3+, 90%), CEA (3+, 90%), and chromogranin (2+, 90%) were positive (Fig. 4). The Ki67 proliferative index was < 10%. She underwent completion thyroidectomy and that lobe was histologically normal. In view of medullary carcinoma, to rule out syndromic association, RET proto-oncogene study was done, which was negative.

Fig. 2 Second nodule—cells arranged in glands and occasional papillae, lined by columnar epithelium showing nuclear clearing and longitudinal nuclear groove. Papillary carcinoma thyroid

Fig. 3 Third nodule—oval spindle-shaped cells with salt and pepper chromatin. Medullary carcinoma thyroid

Discussion

Multiple primary cancer (MPC) with an incidence of 1.8% is defined as two or more cancers in a single patient [2]. Each tumor is independent rather than a metastasis from another tumor and it does not have any relationship with each other. As was in our patient, the simultaneous occurrence of two malignancies in the same patient is extremely rare. Synchronous tumors are defined as ≥ 2 primary tumors occurring within 6 months of diagnosis of the first primary tumor. Warren and Gates gave a histologic criterion of synchronous malignant neoplasm as follows: tumors must be clearly malignant, as determined by histologic evaluation; each neoplasm must be topographically separated and distinct; the probability that one is a metastatic lesion from the other must be ruled out [3, 4]. MPCs usually occur in elderly patients, which was unlike in this patient, who was a young female. Most thyroid cancers are sporadic; some are associated with heredity such as Gardner syndrome, Cowden disease, and MEN syndromes. There is evidence of simultaneous existence of FTC and PTC, where the frequency of concurrent PTC in patients with FTC is 19% [5]. Simultaneous existence of different types of primary thyroid cancer in the same patient has been reported as usually independent and coincidental events. Wong et al. reported that one tumor is often discovered primarily in simultaneous thyroid tumors patients, with the second tumor found incidentally after thyroidectomy [5, 6]. Concurrent appearance of NOS tumor, PTC, and medullary carcinoma thyroid in the very same patient is extremely rare and has not been previously reported in the English literature. In our patient, simultaneous thyroid tumors were discovered incidentally after a hemithyroidectomy, with the initial evaluation giving the impression of a colloid nodule in a multinodular goiter, which is benign. Outcome is poorer for patients with multiple primary cancers than for those with single

Fig. 4 IHC for confirmation of medullary carcinoma—synaptophysin (3+, 90%) and CEA (3+, 90%)

primary cancer and treatment should be planned to achieve best outcome for each cancer.

Conclusion

Synchronous triple primary tumor of thyroid is an extremely rare clinical entity. A multi-modal approach in investigating such patients helps clinch diagnosis. The possibility that multiple primary malignancies may co-exist must be considered during pre-treatment evaluation.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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