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Case Report

A rare combination of double primary malignancies; mixed germ cell tumor of testis with papillary carcinoma of thyroid: a case report

Anuja M. S.*, Abdulla K. P., Arun Chandrasekharan

Department of Medical Oncology, Aster MIMS, Govindapuram, Calicut, Kerala, India

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***Correspondence:**
Dr. Anuja M. S.,
E-mail: anujakavinmugham@gmail.com

ABSTRACT

Double malignancy occurring in multiple organs is relatively rare yet possible. The second primary lesion is identified either simultaneously with the primary lesion (synchronous) or after a while (metachronous). We report a case of synchronous double malignancy in a patient who had two separate carcinomas, a non-seminomatous germ cell tumor (NSGCT) and a papillary carcinoma of thyroid. These types of synchronous double malignancies can be dealt as independent carcinomas. This existence of two carcinomas at anatomically dissimilar sites with distinct histopathologies, being a rare combination, led us to report the case.

Keywords: Papillary carcinoma of thyroid, Synchronous double malignancies, NSGCT

INTRODUCTION

The incidence of multiple primary cancers in the same individual has not been rare at all; reported several times in medical literature. A cancer of a different site and histologic type other than the original cancer is considered a multiple primary cancer.[1] Patients who have already been diagnosed with a cancer, have a further risk of developing another malignancy based on several inherited, environmental and iatrogenic factors. Double primary malignancies can be divided into two types, based on the interval between disease diagnoses. Synchronous malignancies are second tumors that have been occurring either simultaneously or within 6 months after the diagnosis of the first malignancy. The second type are metachronous malignancies, in which the second tumor has developed 6 months after the diagnosis of the first malignancy.[2,3] Although the presence of multiple primary cancers in an individual was reported several times in literature, synchronously occurring primary malignancies involving testes and thyroid in a young patient is a rarity, prompting us to report this case.

CASE REPORT

A 30-year-old male patient presented with complaints of low back ache radiating to bilateral flanks associated with anorexia and weight loss for the past 1 month, for which he was evaluated in an outside hospital. Ultrasonography (USG) abdomen showed multiple enlarged rounded lymph nodes, the largest one adjacent to the right kidney and mild splenomegaly. USG neck revealed a well-defined solitary heterogeneous hypoechoic nodule in the lower pole of the right lobe thyroid measuring 28×18×20 mm with few enlarged hypoechoic lymph nodes in the deep cervical region. Fine needle aspiration cytology (FNAC) neck node was suggestive of poorly differentiated malignant neoplasm with differentials of probable metastatic carcinoma or non-Hodgkin lymphoma. In addition, FNAC thyroid showed adenomatoid nodule (thyroid-Bethesda category-II).

The patient then visited our hospital for further evaluation and management. On examination, the left supraclavicular lymph node was palpable with swelling over the right testis. Serum lactate dehydrogenase (LDH),

alpha-fetoprotein (AFP), and beta-human chorionic gonadotropin (βHCG) levels were high. USG testis showed a relatively well-defined lobulated hetero-echoic lesion with cystic areas, microcalcifications and widespread increased internal vascularity replacing the whole of the right testicle, possibly an intra-testicular neoplasm. positron emission computed tomography (PET-CT) scan revealed metabolically active lesions involving right testis, left supraclavicular, mediastinal, and retroperitoneal nodes, bilateral lungs and liver.

After discussion in the multidisciplinary tumor board, the patient was planned for right high inguinal orchidectomy. Post procedure, histopathological examination showed a mixed germ cell tumor (Seminoma 70%) limited to testis-pT1bNxMx (Figure 1). Immunohistochemistry for SALL4, CD30, and AFP was positive in tumor cells. The final stage was IIIC, poor risk. Patient was planned for 4 cycles of BEP regimen chemotherapy (Bleomycin 30 units IV Days 1,8,15; etoposide 100 mg/m^2 IV days 1 to 5; cisplatin 20 mg/m^2 IV days 1 to 5; each cycle will last 21 days). He completed 4 cycles without major issues. Tumors markers showed a declining trend, but had not fully normalized. AFP was 9.8 (Normal range: 5-10 ng/ml), beta HCG 3.5 (Normal level <2 milli-International units per milliliter), and LDH-248 (Normal range: 140-280 U/L).

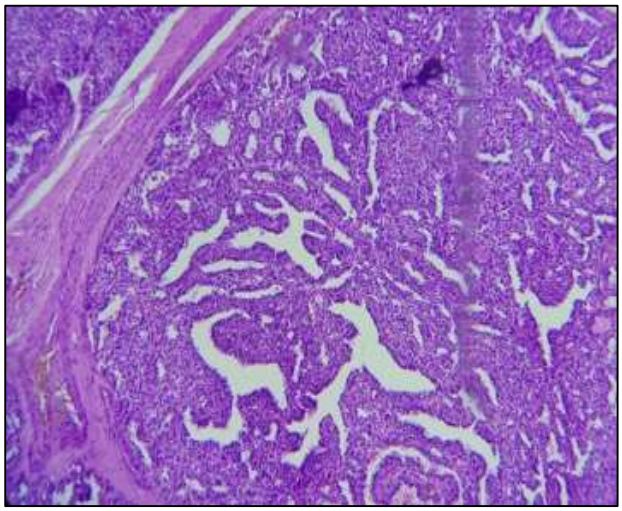

Figure 1: Mixed germ cell tumor (Seminoma 70%, embryonal carcinoma 20%, yolk sac tumor-5%, mature teratoma-5%).

Tumor cells are arranged as glandular and papillary pattern. They have pleomorphic vesicular nuclei, distinct nucleoli and moderate amount of eosinophilic cytoplasm. Squamous epithelium with keratin flakes is also seen.

A repeat PET demonstrated residual lesions in lung (1.1×1.3 cm) in the superior lingular segment of left lung upper lobe, enlarged lymph nodes in precaval, paracaval, aortocaval and para-aortic regions with right thyroid nodule. USG thyroid showed right lobe nodules (TIRADS 5) measuring 3.7×1.7 cm, left level IV lymph node measuring 2.4 cm and bilateral level II and III lymph nodes. FNAC was repeated from thyroid nodule which was then reported as papillary carcinoma thyroid, Bethesda category.

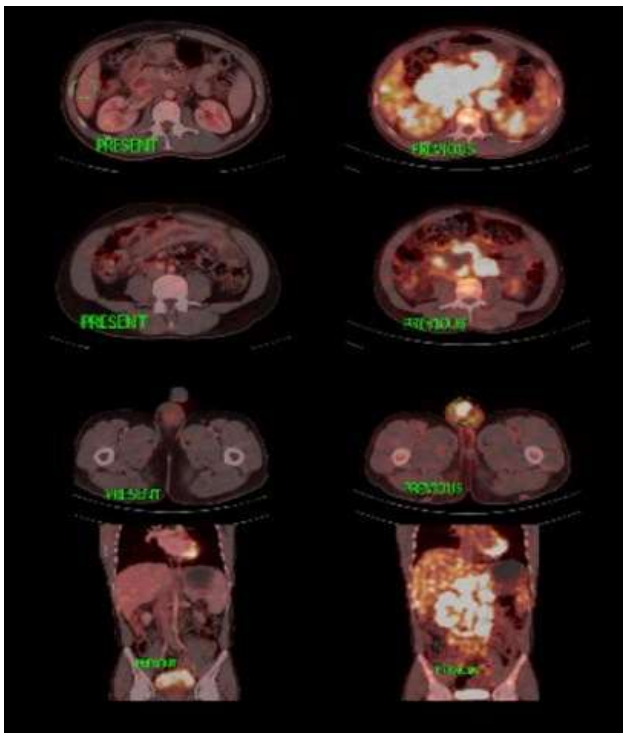

Figure 2: Whole body PET-CT (20/09/2022) in comparison to previous PET-CT scan done on 03/06/2022.

Significant decrease in size and metabolic uptake in lung nodules, liver lesions, supraclavicular, mediastinal and retroperitoneal lymph nodes. Right testicular mass not visualized thyroid nodule.

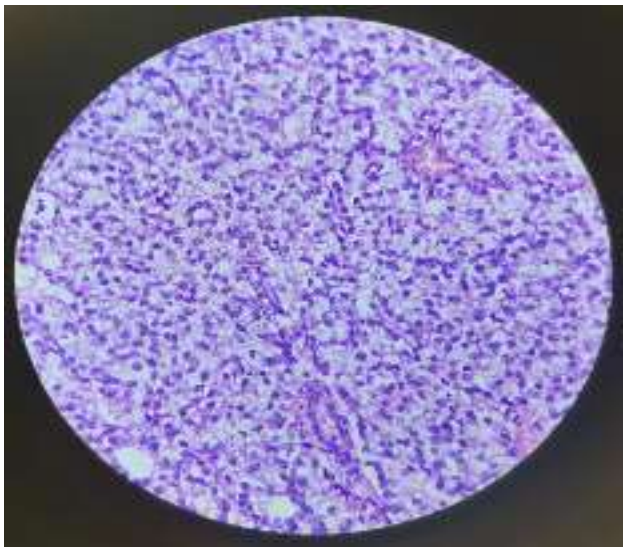

Figure 3: Histology of papillary carcinoma thyroid.

Cells are rounded with scant to moderate amount of cytoplasm, vesicular nuclei that are overlapping and crowded with powdery chromatin and indistinct nucleoli. Nuclear groove and pseudo inclusions are present along with scanty mitosis. Lymphovascular invasion present with no necrosis.

A synchronous dual primary cancer diagnosis of NSGCT and papillary carcinoma of thyroid was made. Based on the multidisciplinary tumor board discussion, retroperitoneal lymph node dissection with total thyroidectomy and central and bilateral modified radical neck dissection was performed. Histopathological examination showed classical papillary carcinoma, stage pT2N0Mx (Figure 3). Retroperitoneal lymph nodes (43 in number) were negative for tumour (Figure 4). The case was discussed again in multidisciplinary tumor board, planned to do radioactive iodine scan and proceed; and to keep Germ cell tumor testis part under regular follow-up. Then the patient was directed to the nuclear medicine department for further investigations and management.

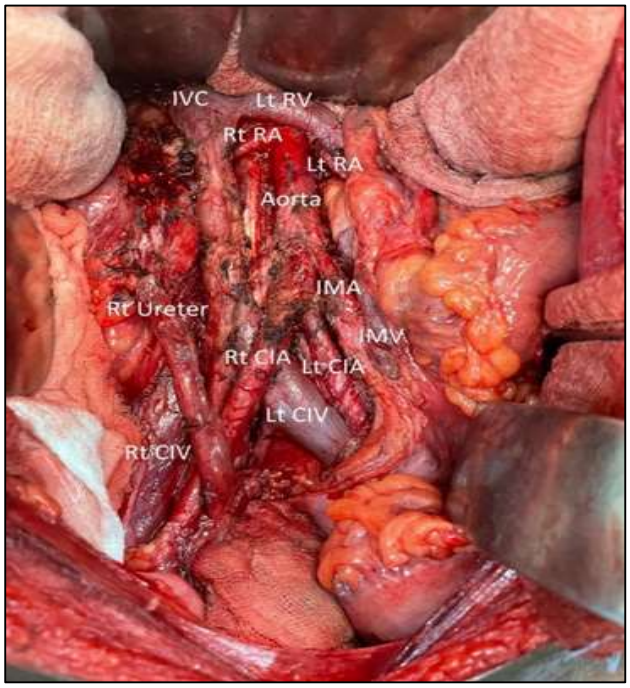

Figure 4: Surgical dissection of retroperitoneal lymph nodes.

DISCUSSION

Description of multiple primary cancers goes as far back as 1889 when Bilroth described it in a single patient.[2] A report by Owen showed that there were 4.7% of multiple primary cancers found in 3,000 cases of malignancy.[3] As early diagnosis methods improve and effective treatments become more widely available, coupled with longer-term monitoring, the number of cases of multiple primary cancers is expected to continue rising with the increasing use of more sophisticated and sensitive imaging methods, such as PET/ CT, more and more cancer survivors are now found to have new suspicious lesions in their thyroid, colon, breast, esophagus, bile duct, and head and neck that might have been missed otherwise.[4,5] A major part of associated primary tumors was metachronous, which highlights the importance of monitoring cancer patients not only for a possible recurrence but also for other newly detected primary neoplasms.[6]

Warren and Gates proposed criteria for the diagnosis of multiple primary malignancies.[7] By adhering to these criteria, it becomes possible to avoid any uncertainty surrounding the nature of a second lesion, as to whether it is a genuine primary cancer or a metastasis. Each tumor should present a definite picture of malignancy, each tumor should be histologically distinct and the possibility that one is a metastasis of the other must be excluded

Sang et al in their study showed that the incidence of second primary cancer is more in male cancer survivors than in the general male population.[8] Additionally, pre-diagnosis smoking, obesity, and elevated fasting serum glucose levels which are well-known risk factors for cancer in the general population, seem to elevate the risk of second primary cancers. In surveillance, epidemiology, and end results (SEER) analysis (1973-99/2.7 million cases) 10% had reported a second tumor.

The second or subsequent tumor often displays distinctive features when compared to the first primary tumor.[9,10] It is often observed that the second or subsequent tumor is often more aggressive, and resistant to therapeutics and is associated with early metastasis. The incidence of additional primary neoplasms related to thyroid cancer reported in literature is 13.1% in males and 13.7% in females.[6] This clearly depicts that the chance of other primary tumors is not uncommon in thyroid neoplasm. Although many studies emphasized the double primary cancer, the presence of germ cell tumor components along with the other primary cancer is very rare. Fossa et al showed in their study that patients with testicular GCT are at a slightly increased risk of a second malignancy.[11]

CONCLUSION

Double primary malignancy was not uncommon and could occur synchronously or metachronously. A strong clinical suspicion and thorough evaluation would pass a long road in the management of these tumors. The interaction of the two primary tumors with each other in the same individual is also an interesting phenomenon and needs to be studied in further detail. In case of double primary malignancy occurring synchronously, single-stage resection will be recommended. On the other hand, a regular follow-up along with screening can pick up the metachronous type at an early stage.

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