

Aggressive poorly differentiated adenocarcinoma of the lung diagnosed 13 months after initial diagnosis of papillary thyroid carcinoma with “non-iodine concentrating” pulmonary metastasis

To the Editor: An aggressive second primary in the form of a lung adenocarcinoma with a rapidly progressive fatal course is described in the setting of a metastasizing differentiated papillary carcinoma of the thyroid. The patient, first presented in HJNM [1], was a 58 years old male, diagnosed with papillary thyroid carcinoma and renal metastases one year back, for which he had undergone a total thyroidectomy with neck nodal dissection. The final histopathologic diagnosis was a differentiated papillary carcinoma of thyroid with lymph node metastases. The patient was also diagnosed with multifocal renal metastases that demonstrated varying degree of radioiodine (^{131}I) uptake and a flip-flop pattern with ^{18}F -FDG-PET study [1]. His thyroglobulin (Tg) was more than 250ng/mL and was treated with two doses of ^{131}I in two visits of 6 months' apart. Post-treatment ^{131}I scan on both occasions had shown uptake in the renal metastases of both sides and in the residual thyroid tissue. No lung lesion was shown in PET and X-rays studies at that time. Recently, he developed progressive dyspnoea and underwent ^{18}F -FDG-PET/CT at a different centre. The present PET-CT study (Fig. 1) showed nodular thickening involving the visceral and parietal surfaces of the entire right pleura (SUVmax 16.5) with bilateral small nodules in the lung. The lesions were initially diagnosed as non-iodine avid metastases. However, in view of his rapidly progressive symptoms that were discordant

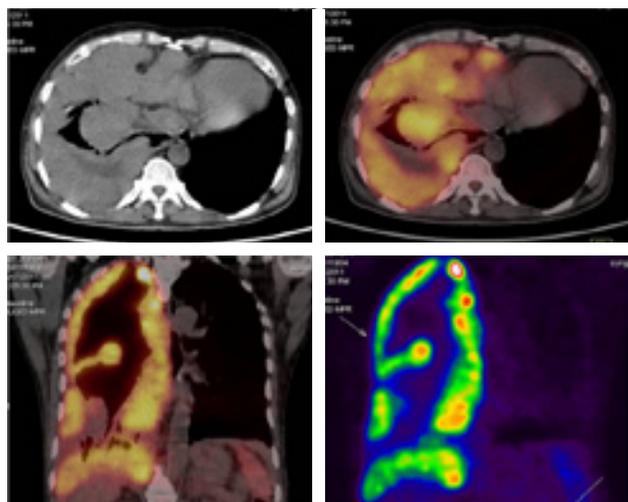


Figure 1. ^{18}F -FDG PET-CT study, transaxial CT (A) and fused PET-CT (B) images showing thickening of right lung pleura with increased ^{18}F -FDG. Coronal fused (C) and PET (D) images demonstrating the thickening involving the visceral and parietal surfaces of the entire right pleura.

with the tumor characteristics of the primary, he underwent computed tomogram (CT) guided right-sided pleural based mass biopsy for pathological diagnosis. On histopathology, the impression was that of a poorly differentiated carcinoma with glandular traits with focal papillary architecture. In view of possibility of a second primary, for objective diagnosis immunohistochemical (IHC) markers were examined and their staining showed diffuse positivity for surfactant protein, TTF-1 and CK7, along with cytokeratin (CK), epithelial membrane antigen (EMA), cytokeratin-19 (CK19) CD10 positivity and anti-mesothelioma antibody (HBME1) negativity. Overall morphological features and IHC profile were consistent with a high grade lung adenocarcinoma (Fig. 2). Mesothelioma was further ruled out, based on HBME-1 and calretinin negativity.

A second malignancy in a patient of thyroid carcinoma with non-iodine avid metastatic disease is more commonly encountered and suspected in practice in the context of a low serum Tg [2]. The whole body ^{18}F -FDG-PET/CT can at times aid this diagnosis. However, as in our case, this can occur even in the setting of very high Tg. Quite frequently, in routine practice, these non-iodine avid ^{18}F -FDG-PET positive lesions are interpreted as non-iodine concentrating metastases due to de-differentiation with no further treatment administered. Histological assessment and application of a panel of IHC markers like positive expression

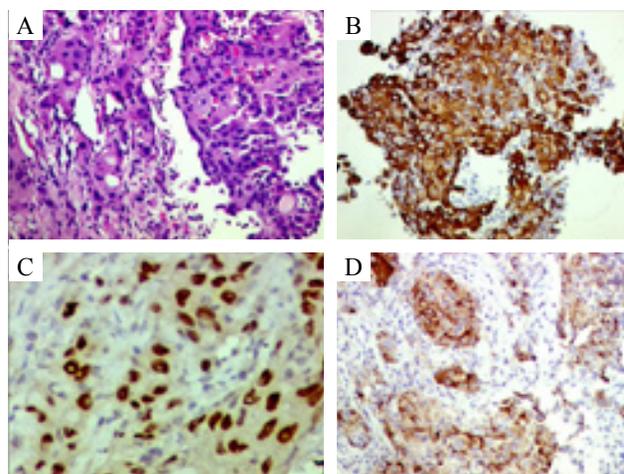


Figure 2. A: Tumor cells arranged in papillary and acinar pattern. Hematoxylin and eosin (H & E) x 200. B: CK7 positivity within tumor cells. DAB x 400. C: TTF-1 positivity (intense nuclear) within tumor cells. Diaminobenzidine (DAB) x 400. D: Surfactant protein-B positivity in tumor cells. DAB x 200.

of surfactant B protein, apart from CK7 immunostaining [3, 4] diagnosed the second primary in the present case. The patient unfortunately died during the first cycle of palliative chemotherapy.

In conclusion, in this communication an aggressive second malignancy in the lungs was diagnosed 13 months after the initial diagnosis in a patient with papillary metastatic thyroid carcinoma that appeared to be non-iodine avid metastasis in the setting of significantly raised serum thyroglobulin. The case underscores the value of histopathological and immunohistochemical correlation in appropriate cases.

The authors declare that they have no conflicts of interest.

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