A Case of Metachronous Triple Carcinoma with Synchronous Double Primary Carcinoma on ^{18}F-Fluorodeoxyglucose Positron Emission Tomography-Computed Tomography

Abstract

Multiple primary malignancies in a single patient are exceedingly rare, but their prevalence has increased in recent decades due to prolonged survival rates supported by the advent of newer and better generation of chemotherapeutic agents as well as advances in cancer detectability facilitated by sophisticated modalities such as positron emission tomography-computed tomography. Here, we discuss a case of a 66-year-old male who recovered completely from lung carcinoma but subsequently developed synchronous gall bladder and gastric carcinoma after 1 year.

Keywords: *Gall bladder, metachronous, positron emission tomography-computed tomography, stomach, synchronous*

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A 66-year-old male was diagnosed with primary bronchogenic carcinoma (adenocarcinoma) in 2016 and underwent six cycles of chemotherapy (docetaxel and pemetrexed). He recovered completely and was symptom free for 1 year until 1 day when he experienced sudden excruciating abdominal pain and then developed jaundice after 15 days. Contrast-enhanced computed tomography (CT) abdomen was done which revealed a mass involving the body and neck of the gall bladder with adjacent infiltration of the liver parenchyma. ^{18}F-fluorodeoxyglucose positron emission tomography-CT (^{18}F-FDG PET-CT) scan was done to rule out any distant metastases which revealed a polypoidal lesion (measuring ~ 4.0 cm × 2.1 cm) in the body of the stomach along the greater curvature showing intense FDG uptake in addition to the lesion in the gall bladder infiltrating the adjacent liver parenchyma [Figure 1a-d]. Biopsy of the stomach lesion revealed a poorly differentiated adenocarcinoma, diffusely infiltrating into the lamina propria on hematoxylin and eosin stain [Figure 2a and b], which was immunopositive for CK7 [Figure 2c] whereas negative for CK20 [Figure 2d], thyroid transcription factor 1, and napsin. These pathological findings were least suggestive of metastasis from the gall bladder or lung primary and more definitive of gastric adenocarcinoma. However, no other distant metastatic sites were documented on the PET-CT scan. Multiple primary malignancies are categorized into two types: (a) synchronous, i.e., having all malignant lesions at the same time or within 6 months of the first malignancy and (b) metachronous in which second or high-order malignancies occur at least 6 months after the last one.[1] The peculiarity of our case lies in the fact that the patient recovered from carcinoma lung but at the same time developed carcinoma gall bladder and stomach after around 1 year. Cancer survivors have a higher risk of new primary malignancy in same or different organ compared to the general population, and it can be therapy induced, syndrome related, or by sharing common etiologic factors.[2] Most of the reported literatures about synchronous primary belong to those with head and neck, aerodigestive tract, lung, ovary, and prostate primaries owing to the concept of "field cancerization."[3] Most cases of the reported synchronous gall bladder and gastric primary belong to the Japanese

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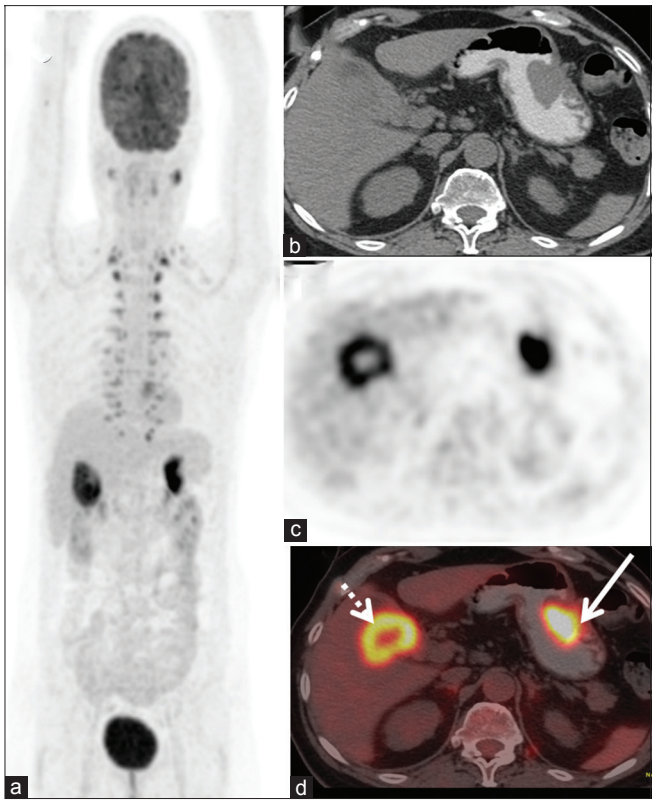

Figure 1: (a) Maximum intensity projection image showing two focus-increased fluorodeoxyglucose uptake in the abdomen (b) Axial computed tomography image showing circumferential wall thickening in the gall bladder and polypoidal lesion in the body of the stomach along the greater curvature which shows increased fluorodeoxyglucose uptake on positron emission tomography (c) and fused axial positron emission tomography-computed tomography image (d)

literature; however, PET-CT was seldom used for its diagnosis.[4-7] The utility of PET-CT using ^{18}F as well as ^{68}Ga labeled for the diagnosis of a second synchronous and metachronous primary in addition to a co-existent primary radiotracer has been highlighted in the literature by Chun-Sing *et al*. and Osman *et al*., respectively.[8,9] PET-CT can clinch the diagnosis with better ease owing to its easier whole-body imaging property and can potentially change the management by avoiding unnecessary "upstage" of the primary malignancy. This case represents a rare scenario and highlights the role of FDG PET/CT in the detection of synchronous malignancies at a stage where both malignancies have not presented with distant metastasis, making treatment with curative intent still a viable option for this patient (thus the negative predictive value of PET/CT is also important in this case) with further emphasis on early follow-up.

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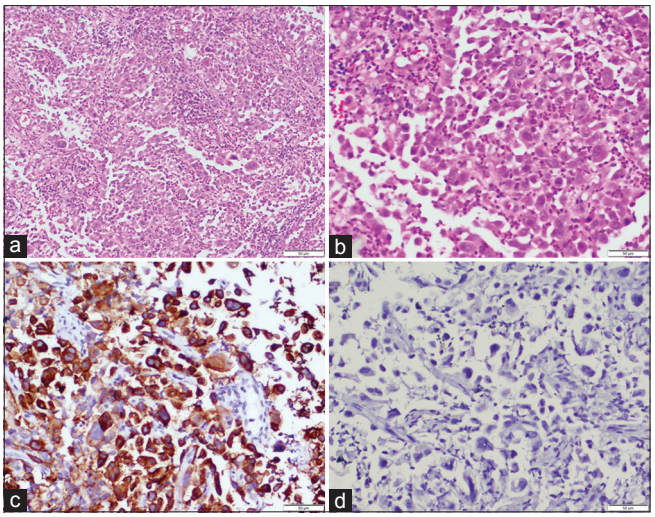

Figure 2: (a and b) Biopsy of the stomach lesion showing poorly differentiated adenocarcinoma, diffusely infiltrating into the lamina propria on hematoxylin and eosin stain, which was immunopositive for CK7 whereas (c) immunonegative for CK20, thyroid transcription factor 1, and napsin (d)

Conflicts of interest

There are no conflicts of interest.

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