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Incidentally Detected COVID-19 Cases and FDG-PET-CT Findings in Patients with Different Primary Malignancies

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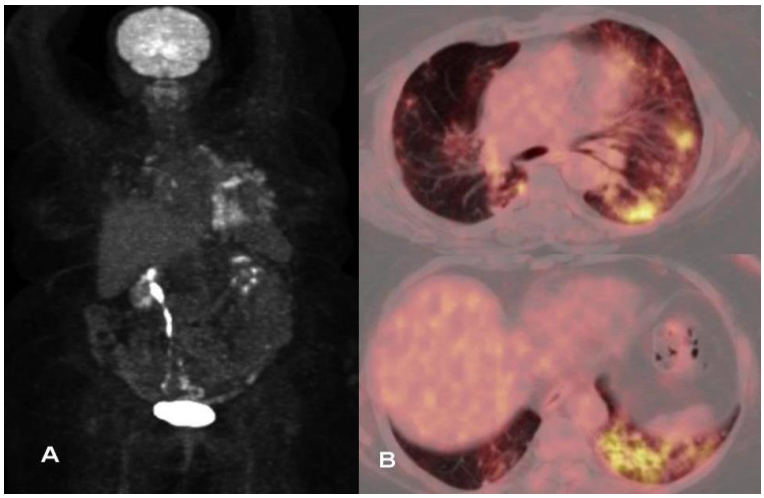
ABSTRACT

Imaging plays an important role in the evaluation of cancer patients. In recent years, much attention has been focused on FDG PET-CT imaging in various cancer patients and has been widely used for staging, restaging, and therapy response for these patients. We hereby, report insidentally detected COVID-19 disease FDG PET-CT findings of 5 cases followed with various cancers.

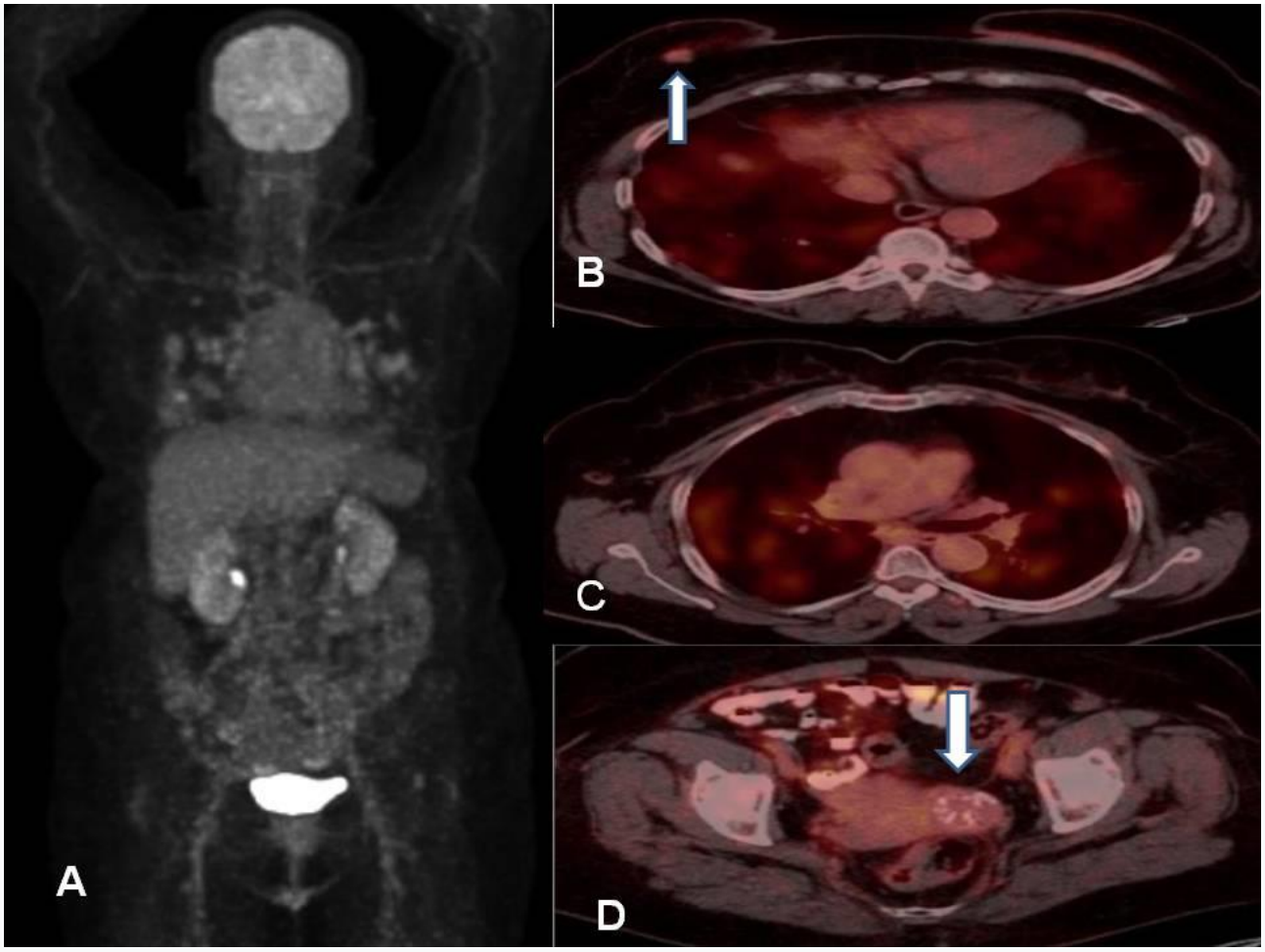
Figure 1



CASE 1-Figure 1: An 60 year old woman with lung cancer underwent Flour-18 Flourodeoxyglucose-Positron Emission Tomography-Computed Tomography (FDG PET-CT) imaging for therapy response evaluation after 15 mCi (555 MBq) FDG injection. MIP (Maximum Intensity Image) (A) and axial fusion images (B) demonstrate complete metabolic response when compared with the previous PET-CT scan. Although, in the current study, areas of hypermetabolic (SUVmax:17) reticulonodular densities and ground-glass opacity with non-uniform

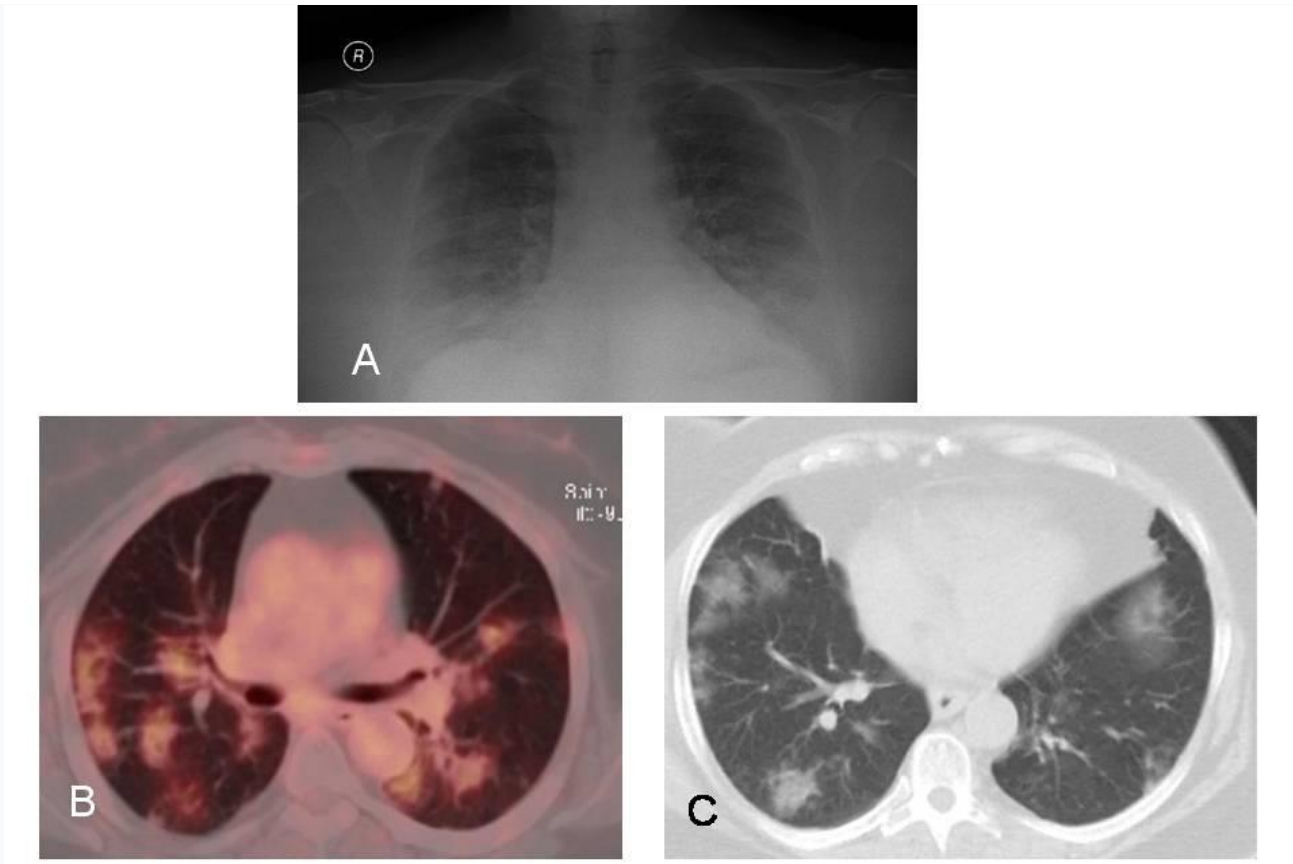
density and air bronchogram were seen in both lung parenchyma areas especially in basal sections. This finding was newly developed during follow-up study and were interpreted in line with the viral COVID-19 pandemic findings. The new coronavirus was isolated from a few of patients in China in the late 2019 and spread with people movement to all over the world in a very short time period. The virus spreads from human to human like flu (8) and result coronavirus disease (COVID-19). Computed Tomography (CT) and lung X ray are currently and widely used as an imaging modality especially in emergency departments for evaluation of COVID-19 cases. FDG PET-CT imaging cannot be used in an emergency setting and generally not recommended in infectious diseases. However, COVID-19 infection is seriously endemic in our country and as the diagnosis, treatment and follow-up processes of cancer patients continue uninterruptedly as can be expected during the current pandemic period, we frequently encounter incidentally detected Covid-19 cases.

Figure 2



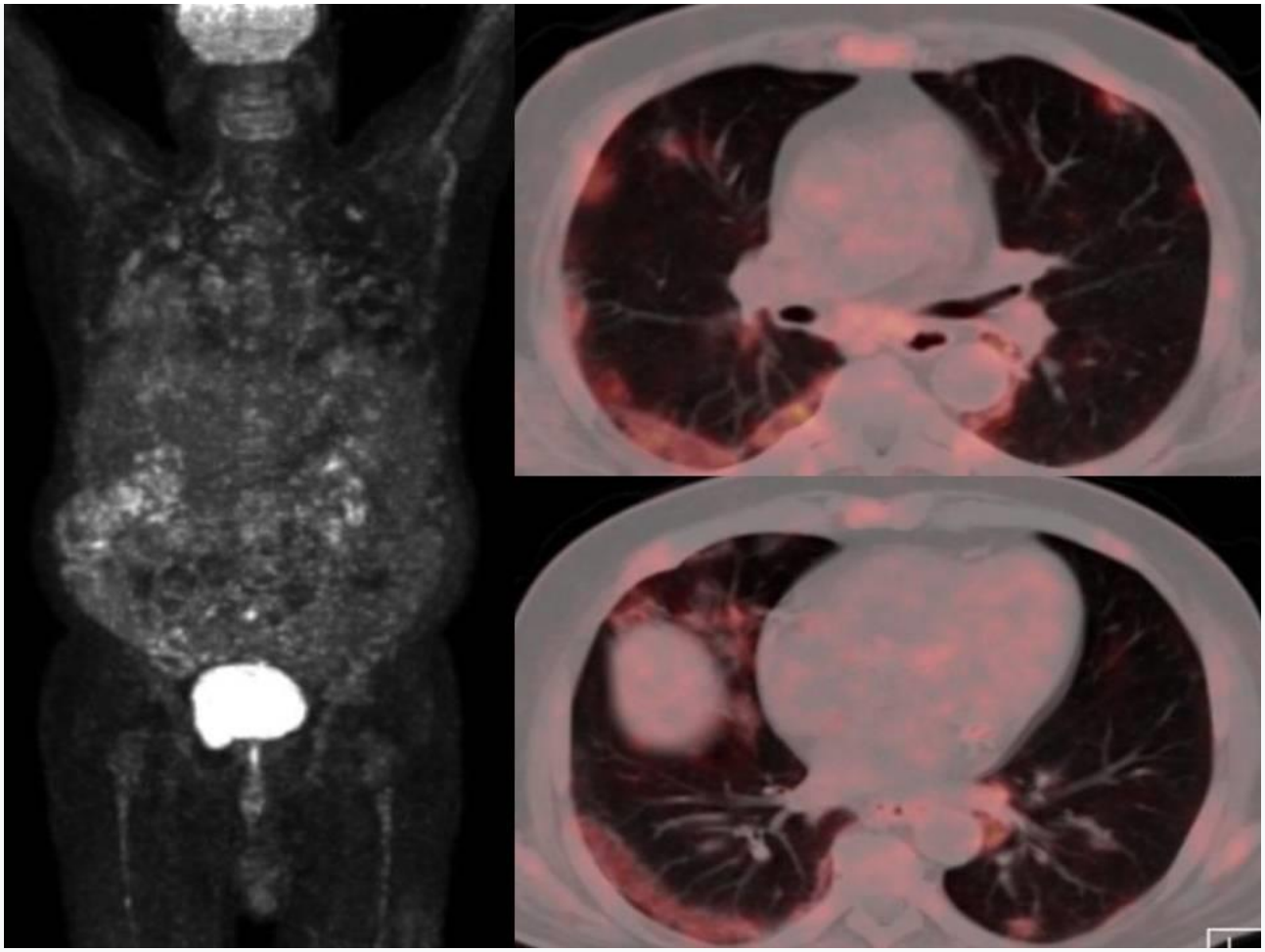
CASE 2-Figure 2: A 62 years old woman with breast cancer underwent FDG PET-CT imaging for initial staging evaluation after 15 mCi (555 MBq) FDG injection. MIP (Maximum Intensity Image) (A) and axial fusion images (B-white arrow) demonstrate right breast lower quadrant centrally located hypermetabolic nodule with spicular contour, 1.5 cm in diameter, consistent with primary malignancy (SUVmax: 5.32) with proven diagnosis of invasive carcinoma pathological diagnosis, axillary reactive lymph node (C) and calcified myoma (D-white arrow).

Figure 3



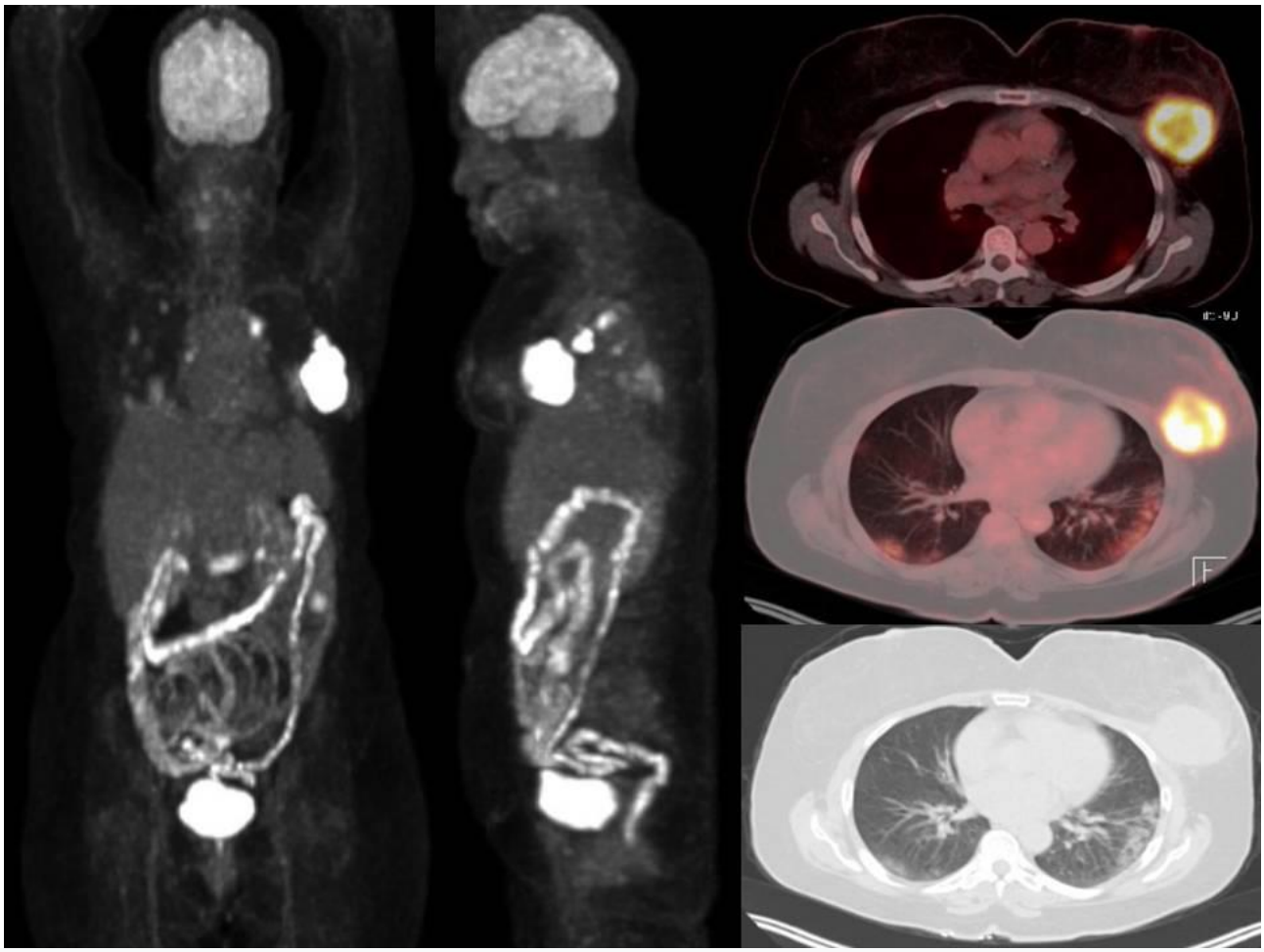
CASE 2-Figure 3: Areas of hypermetabolic reticulonodular densities and ground glass opacity increase in both lung parenchyma areas especially in basal sections were seen (SUVmax: 6.65) and were interpreted in line with the viral COVID-19 pandemic findings. Figure 3 demontrates lung findings in lung X-ray, axial fused PET/CT and axial CT images in the same patient presented in Case 2 Figure 2. In this patient, the operation for primary breast cancer was rescheduled by postponing the COVID-19 contact isolation period due to coincidental findings in PET-CT imaging.

Figure 4



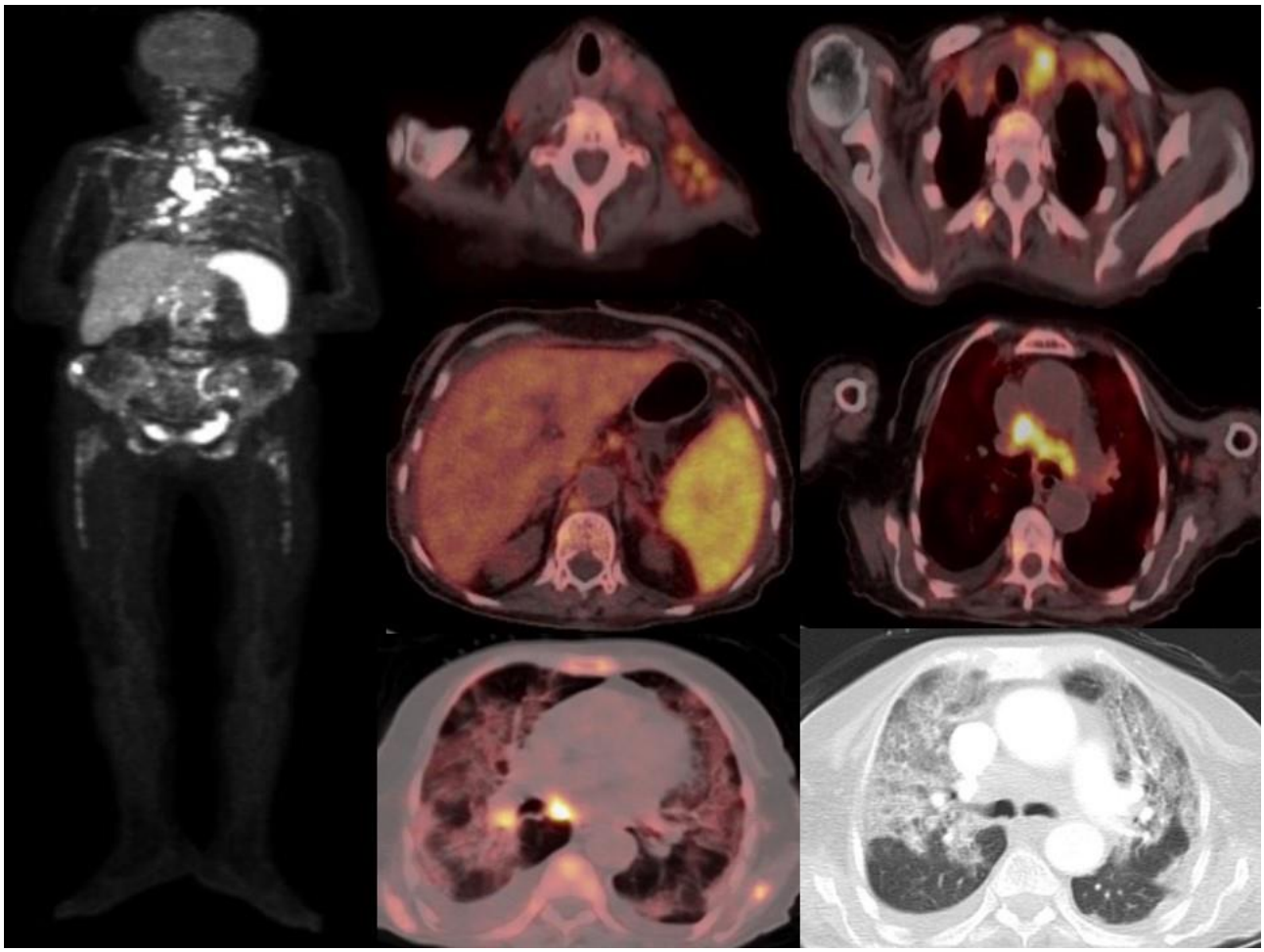
CASE 3-Figure 4: A 59 years old man with cholangiocellular carcinoma underwent FDG PET-CT imaging for therapy response evaluation after 7.5 mCi (278 MBq) FDG injection. MIP (Maximum Intensity Image) (A) demonstrate partially metabolic and anatomical response when compared with the previous PET-CT scan. Although, in the current study, areas of hypermetabolic reticulonodular densities and ground glass opacity increase in both lung parenchyma areas especially in basal sections were newly developed during follow-up (SUVmax: 6) and were interpreted in line with the viral COVID-19 pandemic findings. Mediastinal hypermetabolic lymphadenopathies (SUVmax: 6.09) compatible with COVID-19 infection were also detected.

Figure 5



CASE 4-Figure 5: An 56 years old woman with breast cancer underwent FDG PET-CT imaging for initial staging evaluation after 15 mCi (555 MBq) FDG injection. MIP (Maximum Intensity Images) and axial fusion images demonstrate left breast upper quadrant located hypermetabolic mass with spicular contour, 5 cm in diameter, consistent with primary malignancy (SUVmax: 33.88) with proven diagnosis of invasive carsinoma, axillary and pectoral metastatic lymph nodes (SUVmax:23.35) more than 10 in number with the largest of which is 2.5 cm in diameter. Additionally, areas of hypermetabolic reticulonodular densities and ground glass opacity increase in both lung parenchyma areas especially in basal sections were seen (SUVmax: 13.56) and were interpreted in line with the viral COVID-19 pandemic findings. Treatments planned for the breast were postponed during the isolation period.

Figure 6



CASE 5-Figure 6: A 78 years old woman with peritoneal carcinomatosis and no known malignancy was referred to FDG PET-CT imaging for evaluation of underlying primary malignancy. PET-CT imaging was performed after 60 min of injection of 6 mCi FDG. The PET-CT examination revealed left cervical, bilateral supraclavicular, mediastinal, intraabdominal, bilateral paraosephageal, retrocrural, left axillary conglomereted hypermetabolic lypmhadenopaties (SUVmax: 6-15). Diffuse spleen parencymal FDG uptake (Spleen SUVmax:12 & liver reference SUVmax:6), Abdominal and pleural effusion, bone marrow diffuses and multifocal uptake (SUVmax: 5-18) and peritoneal and mesenteric diffuse and nodulary FDG uptake (SUVmax:10) was also detected. Whole body FDG PET-CT image findings were compatible with stage IVS lymphoma. Additionally, ground glass opacity increases in both lung parenchyma areas especially in upper and middle sections were seen (SUVmax: 3.2) and were interpreted in line with the viral COVID-19 pandemic findings. MIP, axial fused PET-CT, axial CT images Show both lymphoma and COVID-19 lung findings. In the literature, case reports and very small case series describing incidental findings of COVID-19 in patients performed FDG PET-CT imaging for especially oncological patients (1-10). To date, according to evidence-based data, FDG PET-CT cannot substitute or integrate high-resolution CT to diagnose suspicious COVID-19 or for disease monitoring, but it can be useful to incidentally detection of suspicious COVID-19 infection in especially oncological patients and influences therapy plan period.

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