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Title: Isolated malignant portal vein thrombus in colon carcinoma– A rare finding on 18F-FDG PET/CT

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Title : Isolated malignant portal vein thrombus in colon carcinoma– A rare finding on 18F-FDG PET/CT

Abstract:

Isolated malignant portal vein thrombus in absence of hepatic metastasis in abdominal cancers is very rare. The presence of malignant thrombus has clinical significance for determining the staging, treatment decisions and prognosis. 18F-FDG PET/CECT is a noninvasive modality for discriminating between malignant and benign thrombi. We present a 61-year old male diagnosed with primary sigmoid colon carcinoma and 18F-FDG PET/CT scan showed, in addition to FDG avid primary lesion, a FDG avid filling defect in portal vein, likely malignant thrombus.

Keywords: Malignant portal vein thrombus; Colon carcinoma; F-18 fluorodeoxyglucose positron emission tomography-contrast enhanced computed tomography

Figure legends

Figure 1

A 67 year old male presented with history of black color stool for the last 20 days. He had severe anemia with a hemoglobin level of 5.0 mg/dL. There was no past history of previous surgery, tuberculosis, hepatitis, or any other chronic illness. On physical examination, there was no specific finding other than severe pallor. On ultrasonography, a long segmental wall thickening was seen in the sigmoid colon and a filling defect in the portal vein. Patient underwent sigmoidscopy and biopsy of the lesion, histopathology of which revealed moderately differentiated adenocarcinoma. 18F-FDG PET/CT was performed for staging and to assess the nature of the filling defect in portal venous system. After 50 minutes of intravenous injection of 370MBq (10 mCi) radiotracer, PET/CT acquisition was performed on dedicated hybrid scanners (Discovery STE 16; GE healthcare, Milwaukee). A low dose scout scan (120 kV, 10 mA) was acquired from base of skull to mid thigh region. Porto-Venous phase CECT (120 kV, 340 mA) from base of skull to mid-thigh was acquired 55 sec after beginning of intravenous injection of 90 ml intravenous iso-osmolar contrast media. Following CT acquisition, 3D-PET acquisition was done in caudocranial direction with acquisition time of 2 minutes per bed position.18F-FDG PET/CT maximum intensity projection (MIP) image reveals few hot spots in right upper abdominal region in the paramedian plane and pelvic region. Corresponding transaxial and sagittal CECT and fused PET/CT images of pelvis (Figure 1B-E) reveal FDG avid (SUVmax ~21.7) long segmental asymmetrical wall thickening in the sigmoid colon.

Figure-2 and Fig. 3

Corresponding transaxial CECT and fused PET/CT images of upper abdomen revealed FDG avid filling defect in main portal vein (arrow ; SUVmax18.3) and left portal vein (arrow head; SUVmax 16.9); suggestive of malignant thrombus. There was no FDG avid lesion in the liver parenchyma. .

After PET/CT, it was decided to give the patient initial chemotherapy with the CAPEOX (capecitabine plus oxaliplatin) regimen along with oral anticoagulant medication (dabigatran 150 mg. BD) rather than the surgery. After 3 cycles of chemotherapy, the patient expired at his home after few hours of sudden respiratory distress, possibly unconfirmed pulmonary thrombo-embolism, before a response evaluation could be done.

Discussion:

Malignant portal vein tumor thrombus (MPVTT) is rare entity seen in ~2-3% cases and is commonly observed in patients with either primary or secondary malignant liver lesions.(1)The possible mentioned mechanisms for MPVTT are shunt formation between the hepatic artery to the portal vein and microscopic invasion of the portal vein from adjacent hepatic lobule. Isolated MPVTT without liver involvement is very rare and only few cases are reported in the literature. (2, 3) The possible pathogenesis is hypercoagulable state induced by the primary malignant pathology. (4) During routine CECT images, venous thrombosis either malignant or benign appears as a low-attenuation area/filling defect in the vein. Therefore, it is very difficult to differentiate between tumor and blood clot thrombosis on the basis of CECT data alone. (5) Presently, 18F- FDG PET/CT is very helpful to distinguish tumor thrombosis from blood clot thrombosis on the basis of the tracer accumulation. (6) In present case, 18F-FDG PET/CT

showed tracer avid malignant pathologies in the sigmoid colon (primary) and portal vein with no FDG avid lesions in the liver.

The possible approach to the management of such patients is resection of the primary and also the portal venous thrombosis followed by chemotherapy along with oral anti-coagulants and/or subcut. low molecular weight heparin (LMWH). As per the limited literature available, the prognosis of these patients is poor – our patient also died after 3 cycles of chemotherapy before a disease response evaluation could be done. (7)

Conclusion-

The presence of malignant venous thrombi is a poor prognostic factor in malignant pathologies. 18F-FDG PET-CECT is a reliable, noninvasive modality to detect the malignant venous thrombus.

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Figure 1

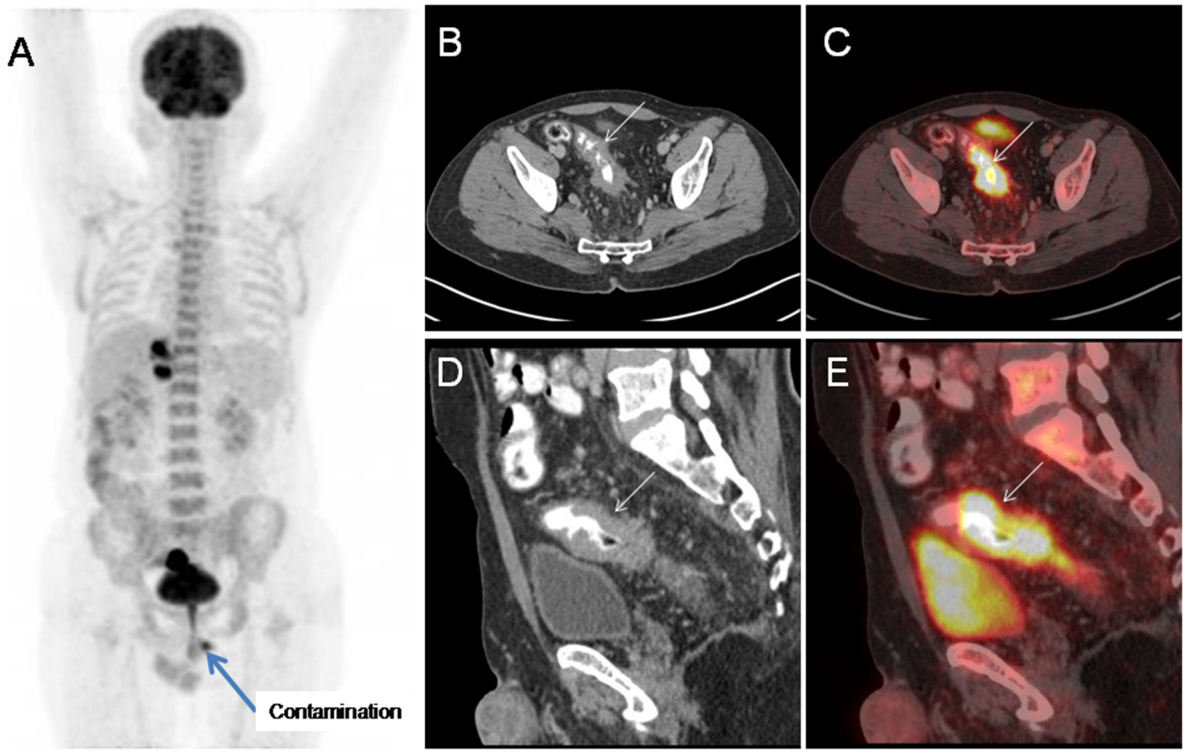
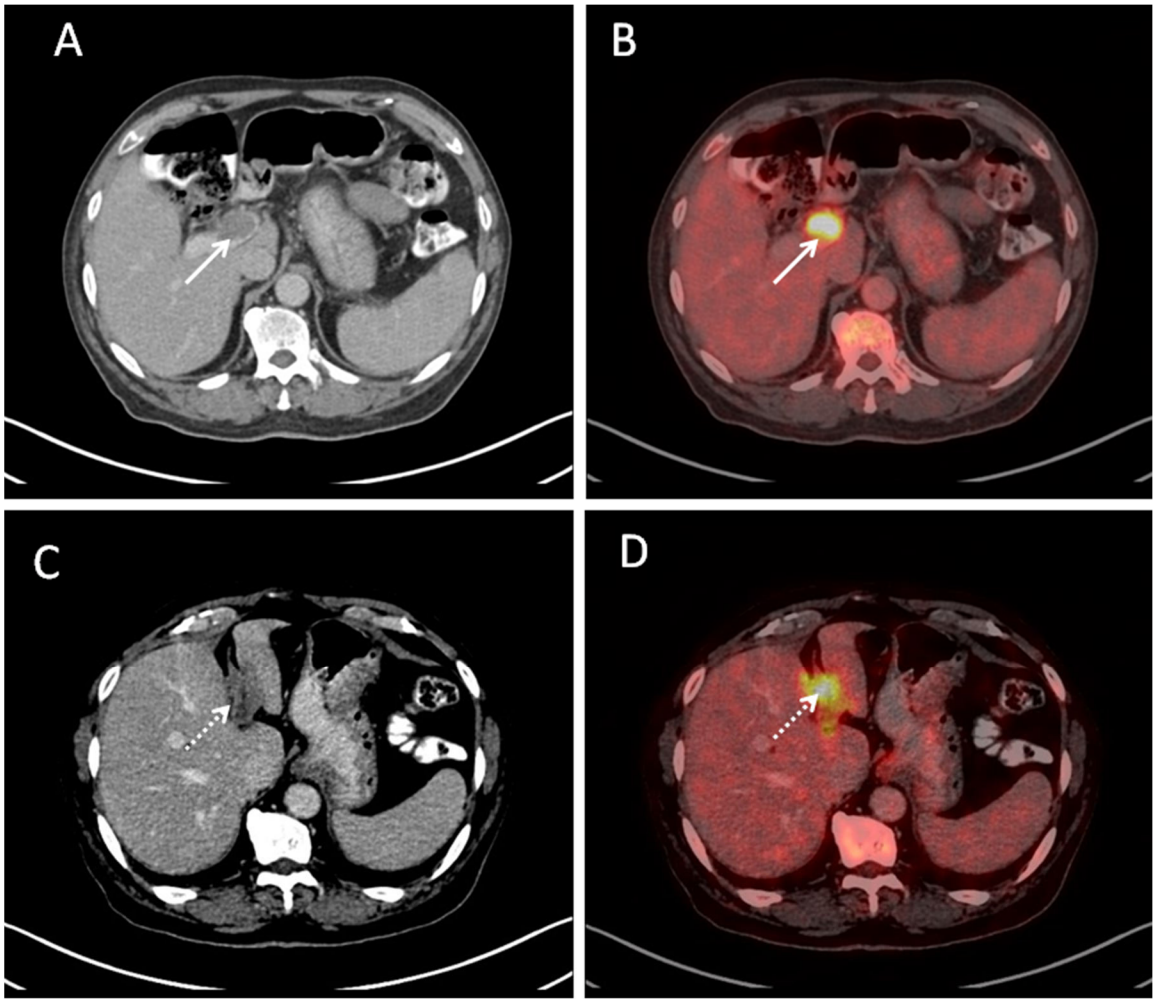


Figure-1

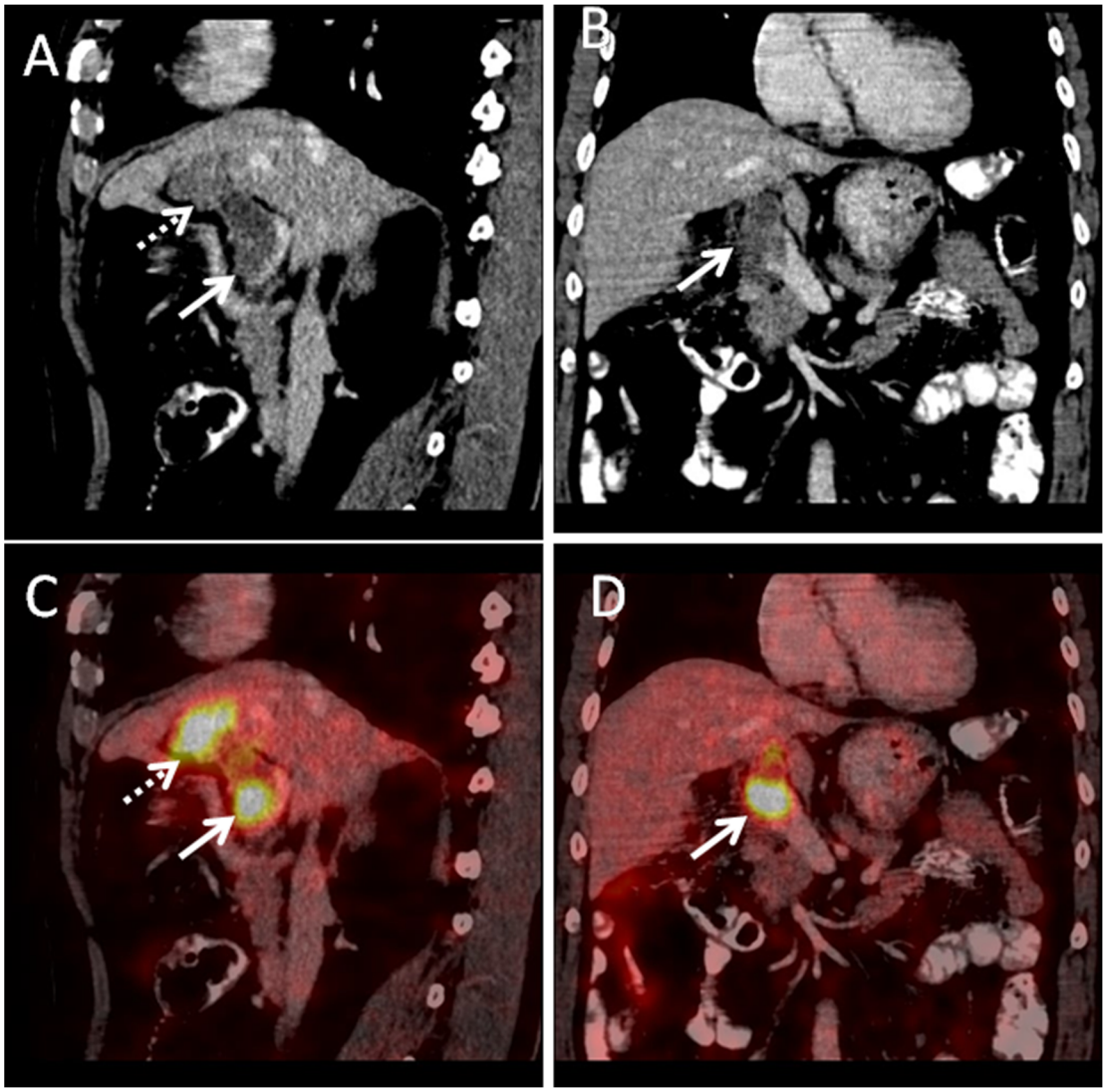
18F-FDG PET/CT maximum intensity projection (MIP) image reveals few hot spots in right upper abdominal region in the paramedian plane and pelvic region. Corresponding transaxial and sagittal CECT and fused PET/CT images of pelvis (Figure 1B-E) reveal FDG avid (SUVmax ~21.7) long segmental asymmetrical wall thickening in the sigmoid colon with perilesional stranding and nodularity.

Figure 2



Corresponding transaxial (Figure 2 A,B, C, D) CECT and fused PET/CT images of upper abdomen revealed FDG avid filling defect in main portal vein (arrow ; SUVmax18.3) and left portal vein (arrow head; SUVmax 16.9)

Fig. 3



Sagittal (Figure 3 A, C) and coronal (Figure 3 B, D) CECT and fused PET/CT images of abdomen revealed FDG avid filling defect in main portal vein (arrow) and left portal vein (arrow head)