

Breast Cancer Cases

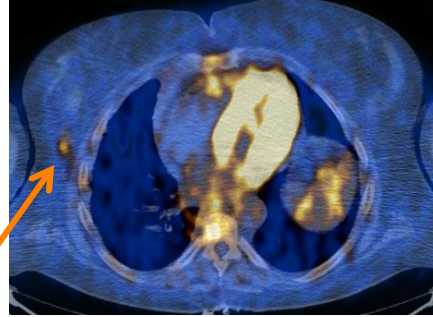
Case 1:



Indication:

- 72 year old female with DLCL-NHL, diagnosed 20 months prior to current examination, achieved complete response at the end of chemotherapy 12 months ago.
- The patient was referred to FDG-PET/CT for routine follow-up, with a previously negative study.

Case 1:



Findings:

A MIP (multiple intensity projection) image and transaxial fused PET/CT at the level of the lower chest are shown.



- A clear focus of increased FDG uptake is demonstrated in the anterior aspect of the right hemithorax, localized by fused images to the lower external quadrant of right breast

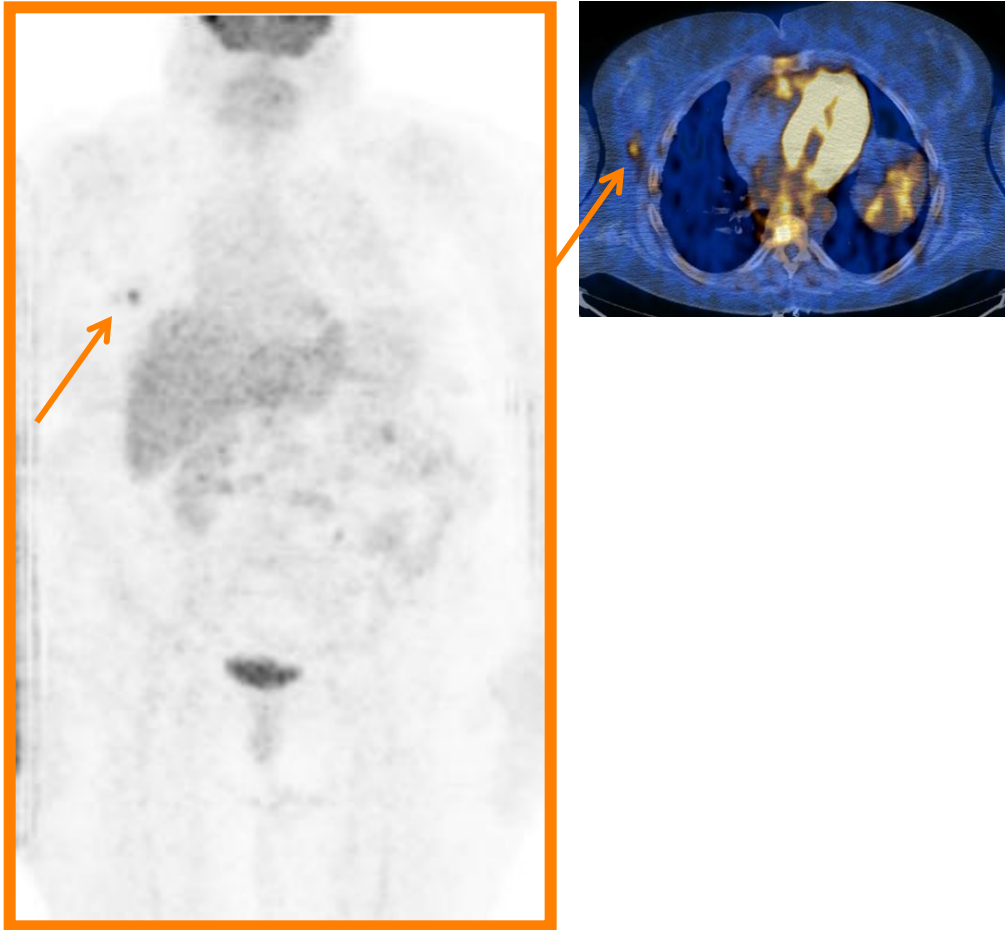
Diagnosis:

- Right invasive ductal breast cancer.

Incidentally Detected Breast Cancer,

Case 1: Breast FDG-avid Incidentaloma - Breast Cancer

Expect the Unexpected



Incidentally Detected Breast Cancer,

Teaching points:

- FDG-PET/CT is not performed routinely for diagnosis of primary breast cancer because of its low spatial resolution and suboptimal performance in small tumors.
- Incidental detection of breast cancer in patients with other primary malignancies has been reported to occur in about 1% of large study populations.
- Incidentally detected FDG-avid foci in the breast have been also reported as representing lymphoma, metastases, or fibroadenoma.

Case 2

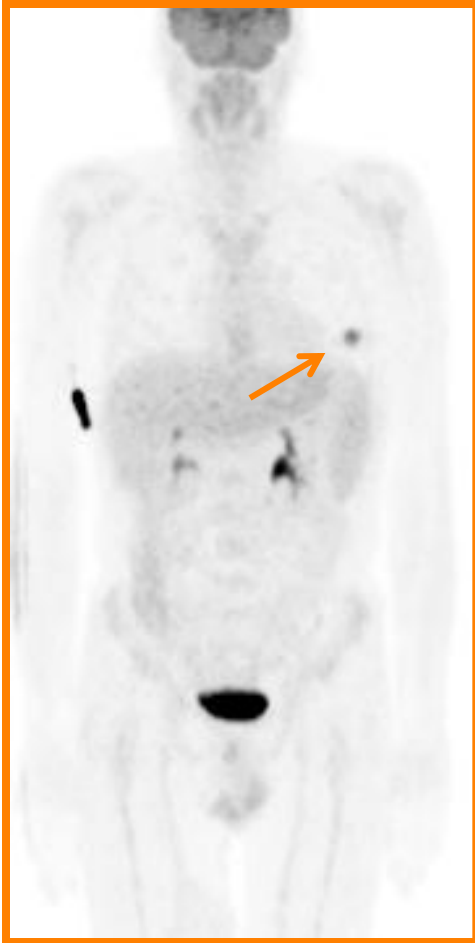


Indications:

A 50 year male with myelofibrosis and liver cirrhosis.

- The patient presented with fever $> 39^{\circ}$ C for over 20 days. CT of the chest and abdomen and US of the abdomen were normal.
- The patient was referred to FDG-PE/CT in search of the source and etiology of the prolonged fever (FUO)

Case 2



Findings:

A MIP (multiple intensity projection) image and transaxial fused PET/CT slice at the level of the lower chest are shown

- A clear FDG-avid focus is seen in the left lower anterior chest wall, localized by fused images to a small subcutaneous nodule behind the left nipple.

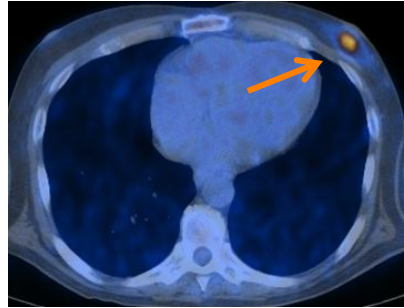
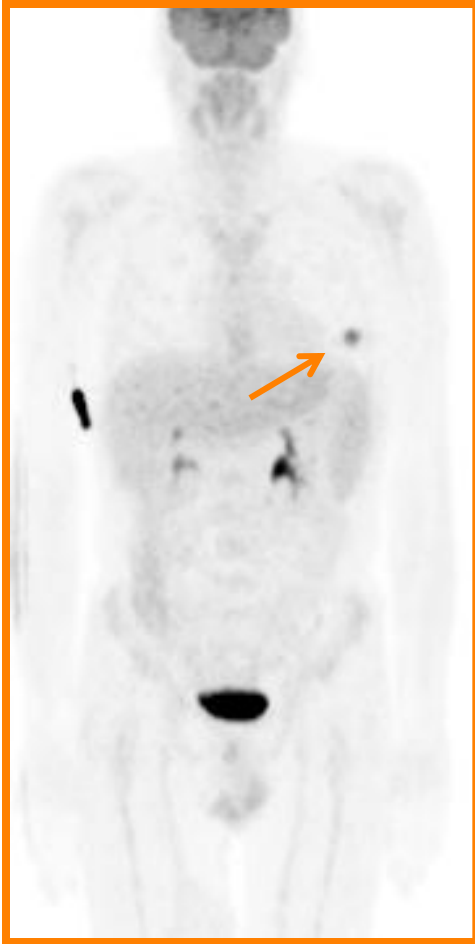
Diagnosis:

- Left breast abscess (diagnosed by US guided FNA)

Fever of Unknown Origin
Abscess in Left Breast

Case 2

FUO – Potential Etiology

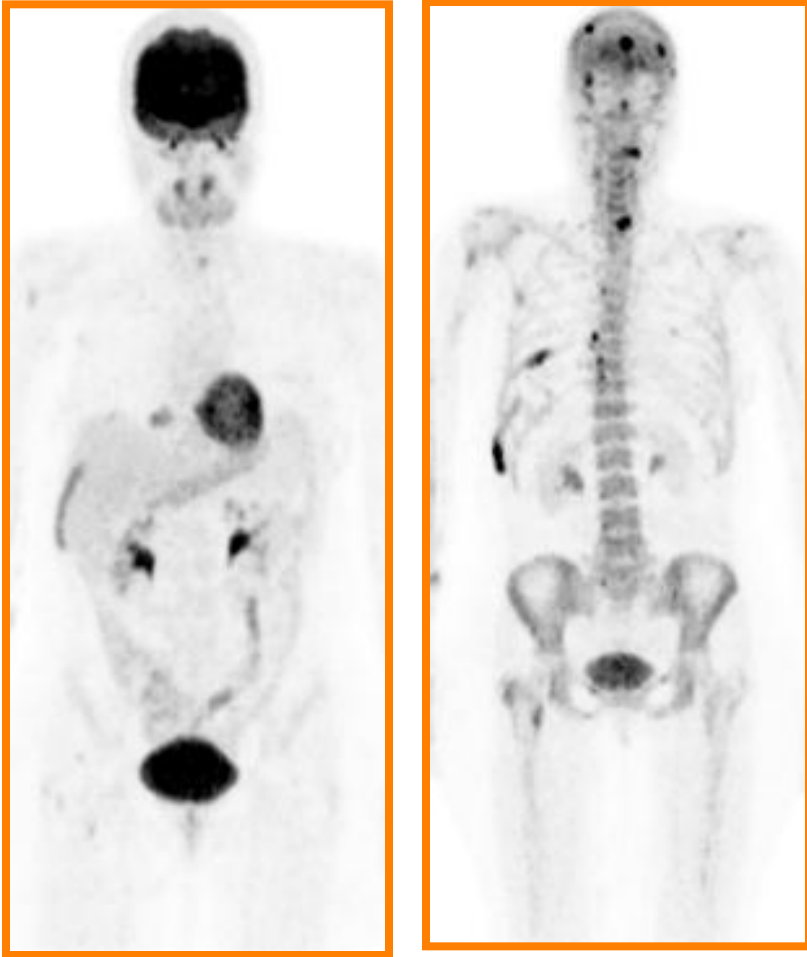


Teaching points:

- The cause of FUO can be related to 3 major categories: infectious, malignant, and inflammatory processes.
- Infections represent the main etiology (up to 30%), mostly of bacterial origin, including tuberculosis, abscesses, endocarditis or osteomyelitis, and, less frequent, viral infections.
- Malignancies, mainly lymphoma, leukemia, renal cell carcinoma or metastatic tumors to the liver, are the second most common cause for FUO.
- Inflammatory processes associated with FUO include arthritis, arteritis or other vasculitic processes, inflammatory bowel disease and systemic lupus erythematosus.

Fever of Unknown Origin
Abscess in Left Breast

Case 3

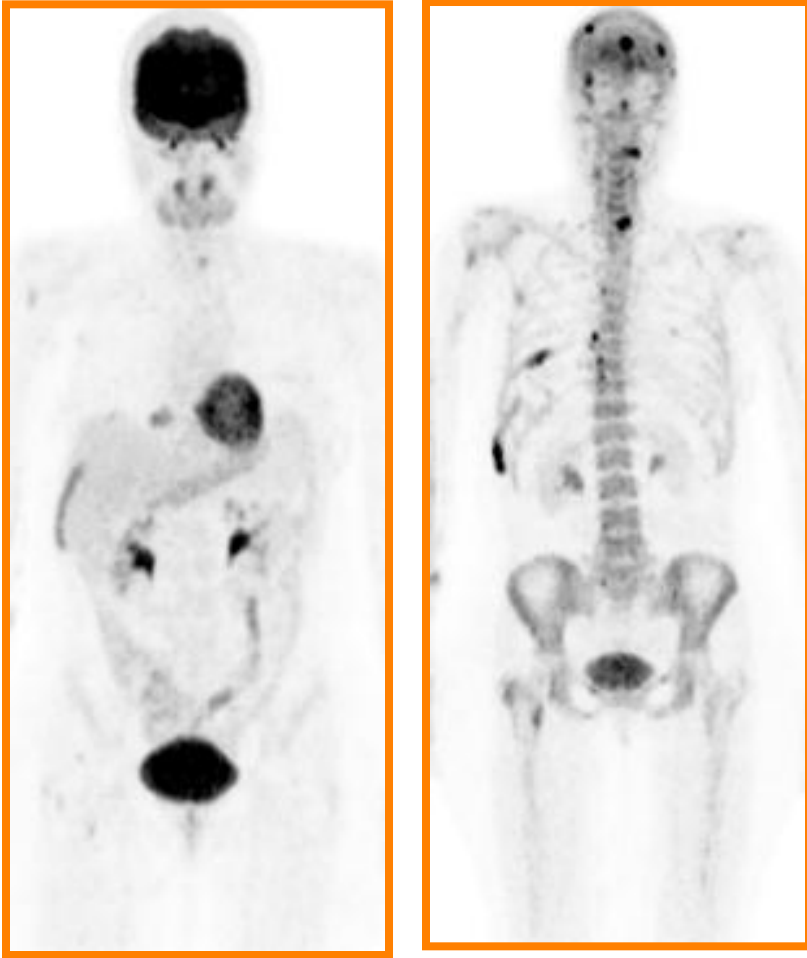


Indication:

44 year old female with locally advanced invasive lobular left breast cancer, grade 2, state after left mastectomy and neoadjuvant chemotherapy 3 years prior to current examination.

- The patient presented with diffuse skeletal pain and equivocal bone scintigraphy.
- She was referred to FDG- and Fluoride-PET/CT with the clinical suspicion of bone metastases

Case 3



Breast Cancer Metastatic to Bone FDG and Fluoride Imaging

Findings:

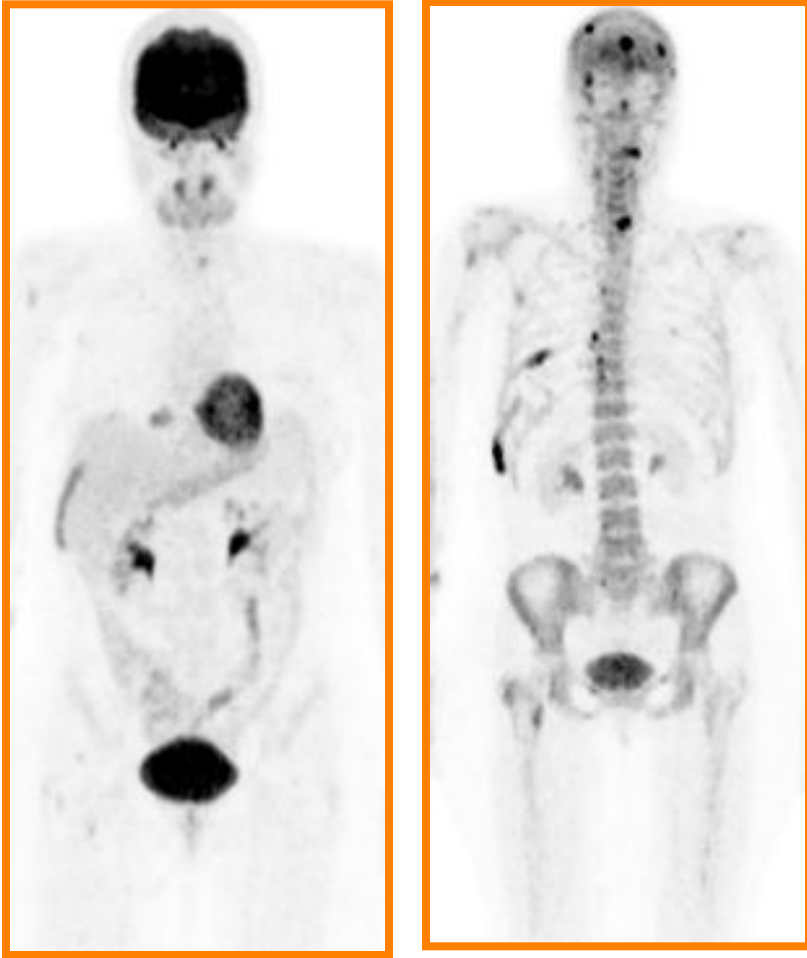
MIP images following administration of FDG (left) and Fluoride (right) are shown

- The FDG study demonstrates abnormal tracer uptake in the right proximal humerus, the upper thoracic spine, along a right lower rib, and, of low intensity, in the right proximal femur.
- The Fluoride study demonstrates additional foci of abnormal tracer uptake in multiple lesions in the skull, thoracic vertebrae, the right scapula, and ribs on both sides.

Diagnosis:

- Multiple bone metastases from breast cancer

Case 3

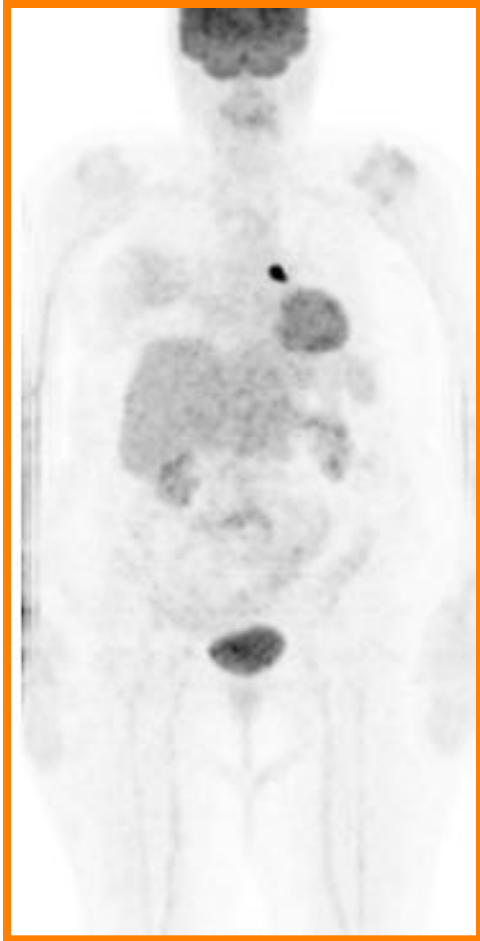


Breast Cancer Metastatic to Bone FDG and Fluoride Imaging

Teaching points:

- Increased FDG uptake can precede bone reaction (seen on bone scan, CT and Fluoride PET), suggesting early bone marrow tumor involvement.
- FDG has been reported to be more sensitive for detection of lytic metastases as compared to blastic lesions considered to be relatively less aggressive, and which are better visualized by Fluoride.

Case 4



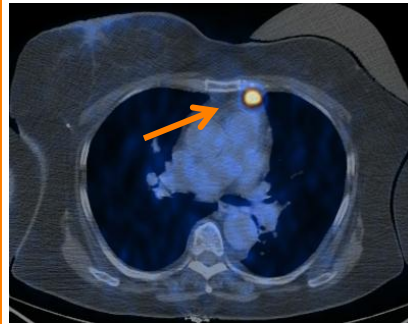
Indication:

77 year old female with bilateral breast cancer diagnosed 4 years prior to current examination, state after left mastectomy and right lumpectomy, and chemotherapy.

The patient was also diagnosed with colon cancer 2 years prior to current study.

- The patient presented with rising tumor serum markers (CEA).
- She was referred for FDG-PET/CT with the suspicion of occult recurrence, and if positive, for determining the most suitable site for tissue sampling for final diagnosis and histology (in view of the two known previous primary tumors).

Case 4



Findings:

A MIP image and transaxial fused PET/CT slices at the mid-thoracic level are shown

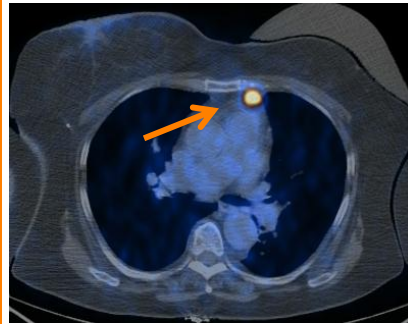
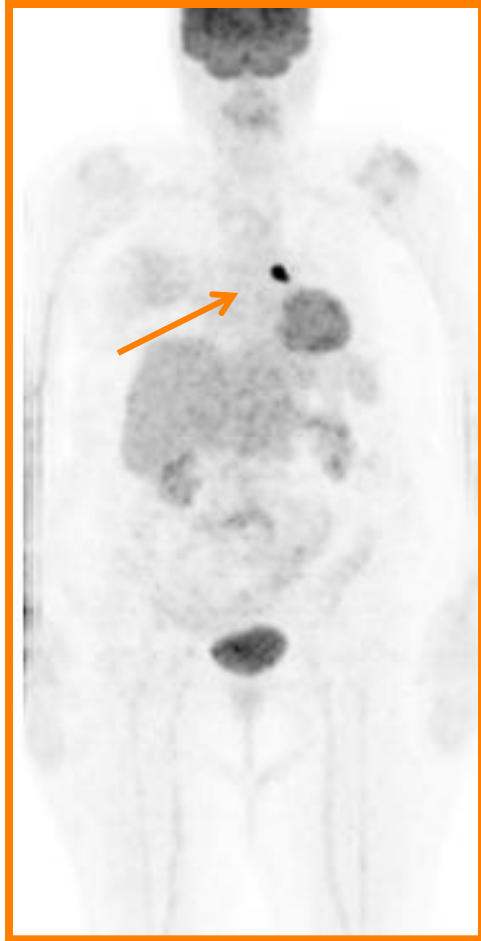
- A clear FDG-avid focused is demonstrated in the anterior aspect of the chest, left to the midline, located by fused images to an enlarged left internal mammary LN.

Diagnosis:

- Recurrent breast cancer (confirmed by biopsy)

Occult Recurrence of Breast Cancer to Internal Mammary LN in Patient with Rising Tumor Serum Markers

Case 4: Breast Cancer with Rising Serum Markers, Occult Recurrence



Teaching points:

- FDG-PET/CT has an accuracy of 90% for diagnosis of recurrent breast cancer in asymptomatic patients with rising serum tumor markers.
- FDG-PET/CT is superior to the combination of conventional imaging modalities (CT, MRI, US and X-rays) for detection of occult recurrence.
- False positive FDG-PET/CT studies are related to tracer uptake in inflammatory processes.
- False-negative findings occur in small subcentimeter lesions.

Occult Recurrence of Breast Cancer to Internal Mammary LN in Patient with Rising Tumor Serum Markers