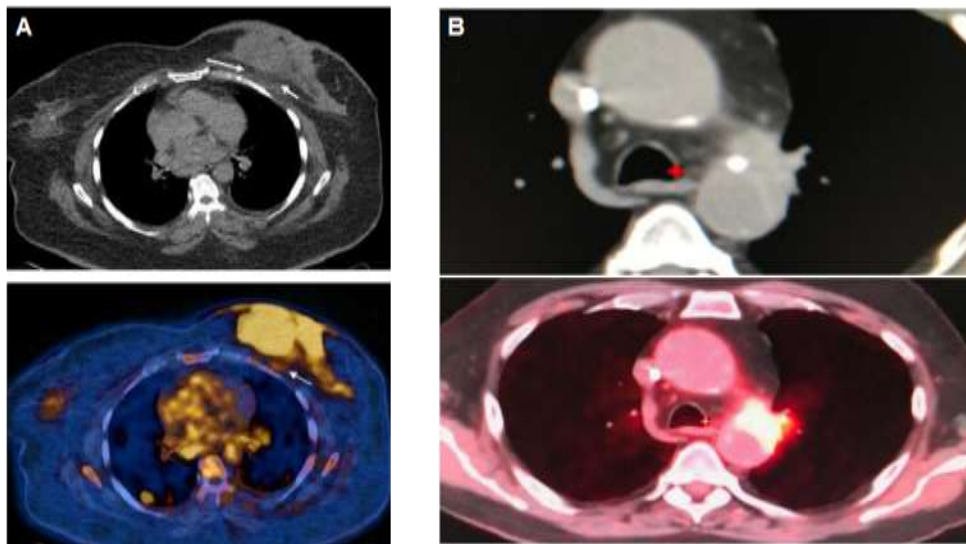


Supplemental Figure 1

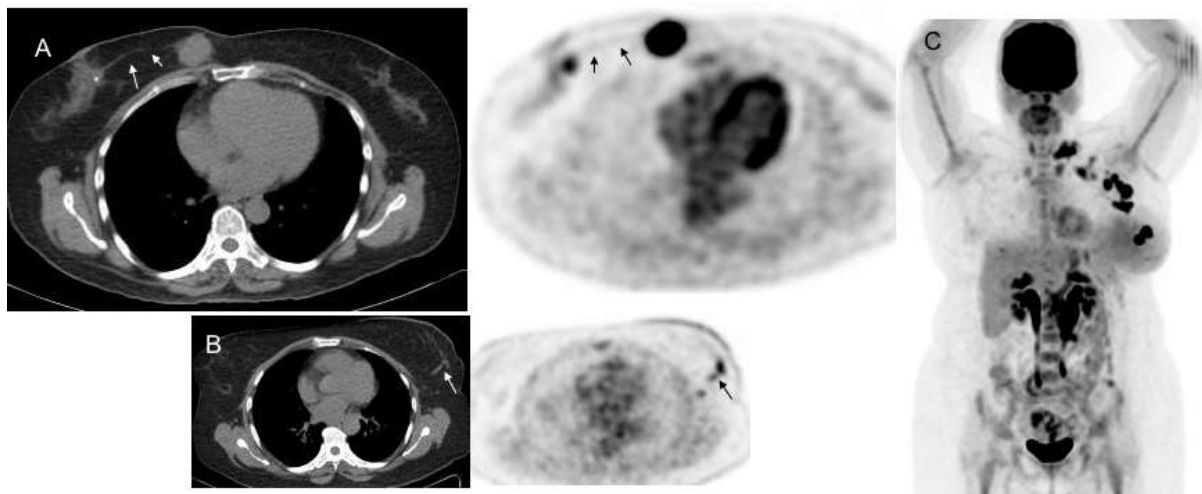
A- A large markedly hypermetabolic left breast tumor (IDC) invading the skin, nipple, areola and pectoralis muscles with loss of fat plane on CT (arrows) (selected transaxial CT and FDG PET/CT fusion images). A hypermetabolic focus is also seen in the right lung and multiple other foci/metastases in the lymph nodes, bones and both lungs (not shown).

B-Primary left lung cancer invading the aortic wall (selected transaxial chest CT and FDG PET/CT fusion images).



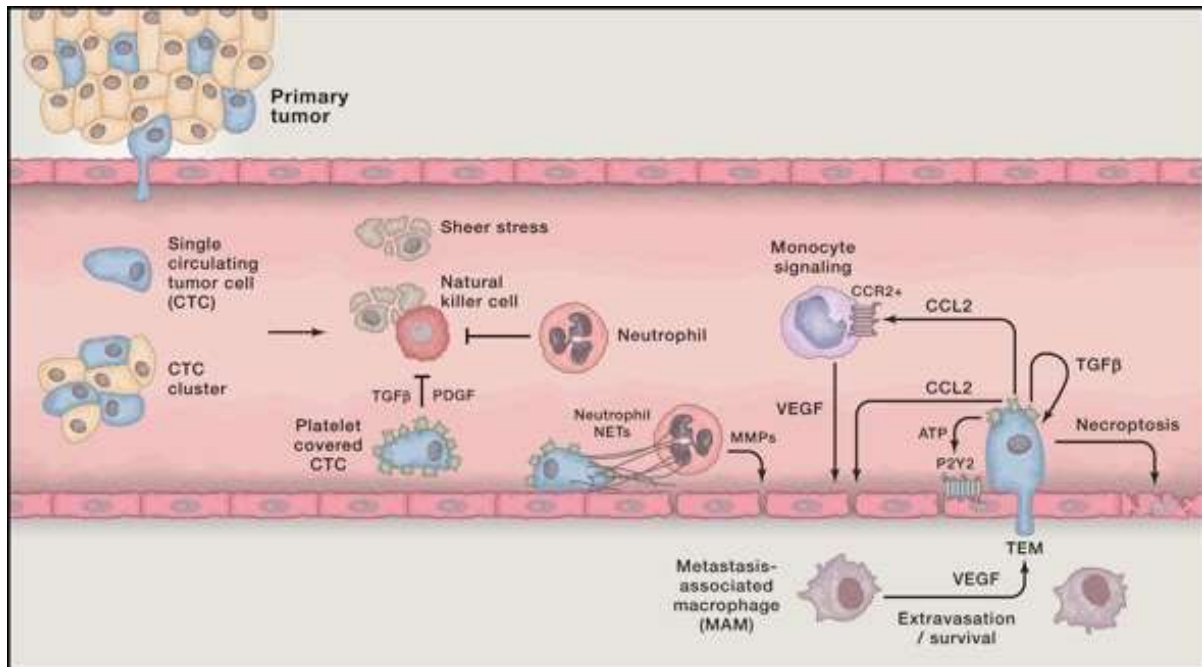
Supplemental Figure 2

Tumor uptake in the lymphatic channels. Selected transaxial CT, FDG PET and PET/CT fusion images in two cases with newly diagnosed breast cancer. A- Images show the hypermetabolic primary tumor in the right breast (arrow) invading the skin/nipple, and a lymphatic channel with mild linear uptake (arrows) extending from primary to a secondary focus (arrow) which is larger and more hypermetabolic than the primary focus. B- Images show the hypermetabolic primary tumor in the left breast (arrow) and a lymphatic channel arising from the tumor directing towards the axilla with mild linear uptake (arrow) and uptake in the left axillary lymph node. C- FDG PET images showing lymph node metastases. Multifocal left breast tumor (IDC) with multiple lymph node metastases in the left axilla, subclavicular and supraclavicular regions.



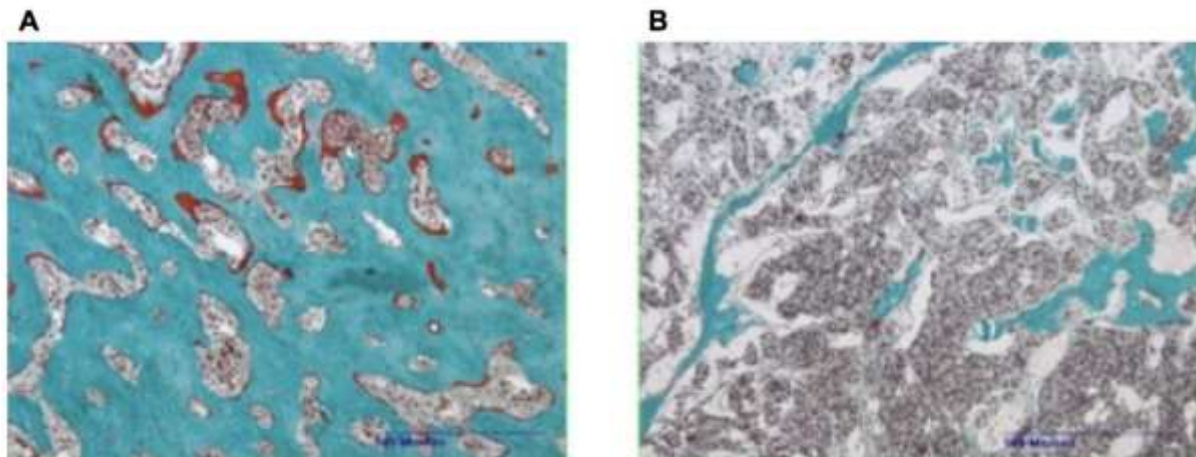
Supplemental Figure 3

Cancer cells escaping from the primary tumor, traveling in the circulation, interacting with the various cells and substances in the circulation, and entering into new soil (Reprinted with permission from Elsevier) (39).



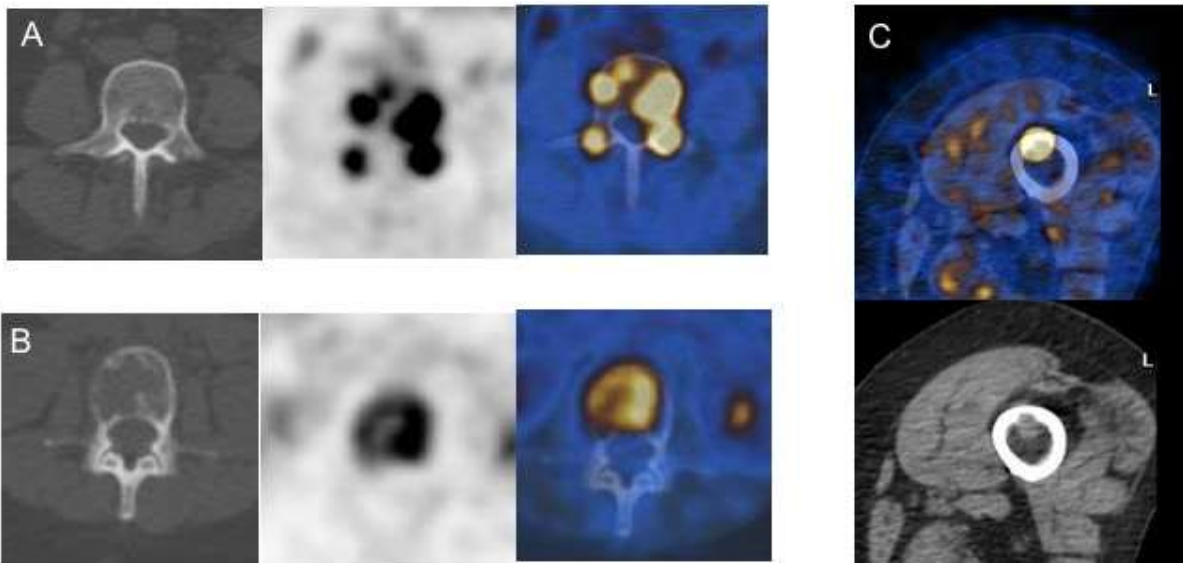
Supplemental Figure 4

Spectrum of histological patterns observed in prostate cancer bone metastases from one patient: A- Osteodense biopsy and B- Osteopenic biopsy taken from two different anatomical sites in the same patient. In all biopsies, bone marrow is entirely filled with prostate cancer cells. Magnification 5x. (Reprinted with permission from Elsevier. Image altered (47)).



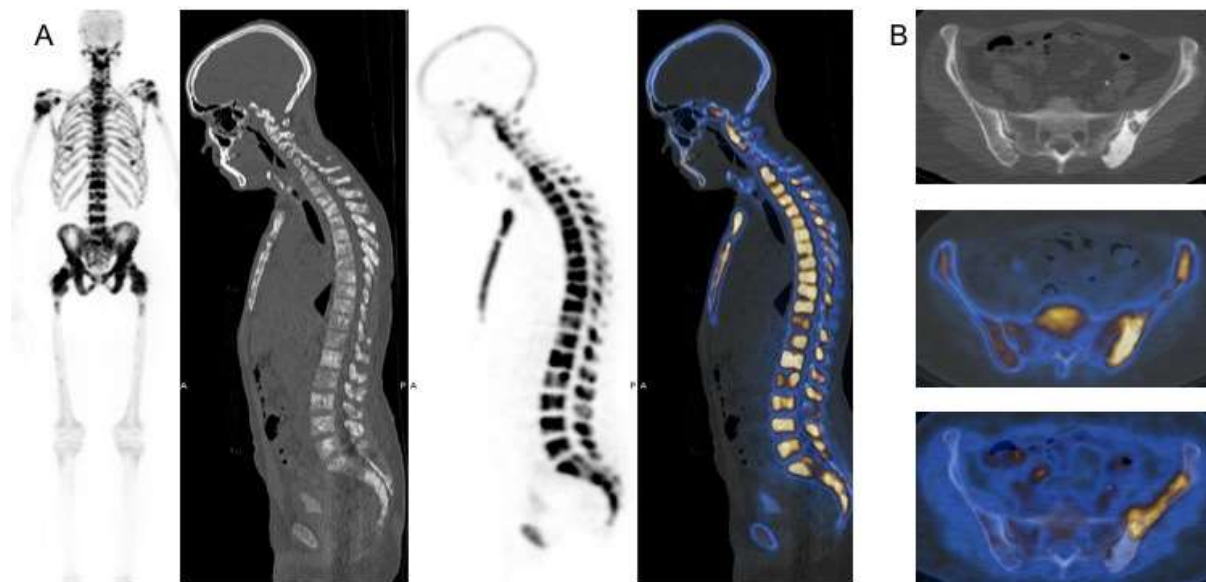
Supplemental Figure 5

Lytic bone metastases. Selected transaxial CT, FDG PET and PET/CT fusion images. A- In a case with breast cancer, CT shows only minimal lytic changes in the vertebral cortex laterally on the left (arrow) but FDG PET shows multiple foci of markedly increased metabolic activity in the vertebra. B-In a case with breast cancer, CT shows significant lytic and destructive changes in the vertebral body and PET shows markedly increased metabolic activity which is heterogeneous. C- In a case with multiple myeloma, FDG PET shows an active hypermetabolic intramedullary lesion which invades the bone and causes a lytic lesion as seen on CT image. FDG PET has higher sensitivity in detecting osteolytic bone metastases than osteoblastic ones. This is mainly due to higher cancer cell density in lytic lesions than osteoblastic lesions and also lytic metastases to arise from more aggressive primary tumors which are highly FDG avid.



Supplemental Figure 6

A-Diffuse osteoblastic metastases in a case with prostate cancer. NaF PET MIP and sagittal CT, PET and PET/CT fusion images show multiple sclerotic foci in the axial bones seen on CT (only spine shown) and diffusely and heterogeneously increased osteoblastic metabolic activity in the axial bones. B-Mixed lytic-sclerotic lesions in a case with breast cancer. CT shows lytic and sclerotic changes in the left posterior iliac bone. NaF PET shows increased uptake corresponding to sclerotic changes and FDG PET shows increased uptake in the anterior iliac region and focal uptake in focal lytic area in posterior iliac. FDG PET has low sensitivity in detecting osteoblastic metastases because the cancer cell density in the tumor tissue is low due to new bone formation and also they usually arise from tumors which are less aggressive or have low FDG avidity.



Supplemental Figure 7

Peritoneal carcinomatosis in two cases. FDG PET MIP, and selected transaxial CT, PET and PET/CT images of the abdomen. A- There is omental thickening/nodularity and diffusely increased uptake (omental caking) in a case with endometrial cancer. B- There is ascites with faint uptake and mild diffusely increased uptake along the parietal peritoneum in a case with breast cancer. Uptake in the region of the bowel loops could be from visceral peritoneal uptake versus physiological bowel activity.

