Interesting images

Flip-flop pattern of skeleton after treatment in a patient with Hodgkin’s lymphoma

Patrón «flip-flop» en esqueleto después del tratamiento en un paciente con linfoma de Hodgkin


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A R T I C L E   I N F O

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$^{18}$F-FDG PET/CT is a well-established method used both for staging and follow-up examinations of patients with lymphoma. In addition, it provides valuable information considering bone marrow infiltration. We present a case of 46-year-old female with lymphocyte-depleted Hodgkin’s lymphoma who underwent $^{18}$F-fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET/CT) for initial staging and for response evaluation to chemotherapy. Evaluation of pre- and post-therapy scans side by side revealed an unusual flip-flop pattern of skeleton as reversing FDG uptake (Fig. 1).

Fig. 1(A) shows maximum intensity projection (MIP) and sagittal images of staging FDG PET/CT scan (upper row) demonstrate multiple areas of intense FDG uptake in lymph nodes throughout the body and liver, as well as patchy pattern of FDG uptake in the skeleton indicating lymphomatous involvement. Axial fused FDG PET/CT and FDG PET images (lower row) demonstrate intense metabolic activity in T11 vertebra (SUVmax: 12.52), as well as hypermetabolic foci in liver (SUVmax 12.56) and right 8th rib. Lymphomatous infiltration of bone marrow was further confirmed by histopathological examination of the iliac crest biopsy sample. (B) Three weeks after

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completion of chemotherapy, MIP and sagittal PET image (upper row) demonstrate complete metabolic response of the lymph nodes and liver lesions, along with patchy uptake seen in bone marrow. Axial fused PET/CT and FDG PET images (lower row) through T11 vertebra demonstrate reversing pattern of FDG uptake appearing FDG non-avid in previously involved/hypermetabolic parts of vertebra, in contrast to FDG-avid spared marrow parts due to rebound after therapy. Diffuse FDG uptake in bone marrow is commonly attributable to the effect of hematopoietic cytokines and inflammation whereas malignant infiltration is strongly suspected in case of heterogeneous uptake. In this case, we considered that decreased FDG uptake with lack of expected marrow rebound after therapy in parts of bone/bone marrow indicated effective therapy where malignant cells were replaced by fibroblastic cells resulting in lack of normal bone marrow at the site of the dead tumor cells. Evaluation of pre- and post-therapy scans side by side is substantially important in case of heterogeneous uptake in bone marrow where this kind of flip-flop pattern could lead to misinterpretation of PET/CT findings. It may be concluded that this phenomenon would be subjected to further evaluation for differential diagnosis of cold defects in bones unless the initial staging examination was performed. Although this kind of flip-flop pattern was previously demonstrated in a case of non-Hodgkin lymphoma, to our knowledge, this is the first case report demonstrating the flip-flop phenomenon in lymphomatous infiltration of bone marrow in Hodgkin’s lymphoma.

References