Interesting image

Bilateral multiple pulmonary $^{18}$F-FDG microembolisms demonstrated on PET/CT

Múltiples microembolismos pulmonares bilaterales en $^{18}$F-FDG PET/TAC

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A 51-year-old female patient presented with a history of mastectomy and chemotherapy because of breast cancer. $^{18}$F-FDG PET/CT was performed to assess treatment response and revealed partial regression of the lung and liver metastases (data not shown). In addition to these lesions, maximum intensity projection, transaxial slices of CT and fusion PET/CT images of thorax demonstrated bilateral multiple pulmonary focal FDG uptakes in the right upper lobe, right lower lobe and left upper lobe without any anatomical correlation on CT (Fig. 1). This artifact is well known in the literature and most likely explained by the migration of $^{18}$F-FDG containing blood clot that produced during injection process from injection site to small vascular structures of the lung parenchyma. Blood clots may exist when vascular endothelium is damaged by paravenous injection, high flow of materials, location of needle tip, or aspiration of blood. Paravenous injection is known as the most appropriate mechanism for FDG microembolism. Although $^{18}$F-FDG is generally injected into a vein in the forearm, in our case it is administered into the dorsal vein of right foot due to invisible and impalpable forearm veins. At sites of endothelial injury, platelets are activated and adhere to the subendothelium, rapidly change their shape and subsequently aggregate, releasing the contents of the α-platelet granules by exocytosis. Although anaerobic glycolysis is the major energy source for platelets at rest, all steps of the activation process are highly dependent on extracellular glucose. The most active glucose transporter, GLUT-3, has been shown to be the major agent responsible for glucose uptake by activated platelets.Activated platelets and fibrin are the major constituents of blood clots and this may account for the high $^{18}$F-FDG uptake of the focal lesions observed on PET images. To our knowledge, this is the first report of bilateral multiple microembolisms in the lung following paravenous $^{18}$F-FDG radiotracer injection at the dorsum of the foot. Our hypothesis is that lower extremity injection and the degree of endothelial injury may account for bilateral multiple FDG microembolisms.
Figure 1. Maximum intensity projection (A), transaxial slices of CT and fusion PET/CT images of thorax demonstrated bilateral multiple pulmonary focal FDG uptakes in the right upper lobes (B and C), right lower lobe (D) and left upper lobe (E) without any anatomical correlation on CT.

Conflict of interest

All the authors state that there were no conflicts of interests when the manuscript was written.

References

