Interesting image

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

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

S. Gungor$^{a,*}$, M. Mazican$^{b}$, I. Koc$^{c}$, H. Bal$^{d}$, N. Mazican$^{e}$

$^a$ Department of Nuclear Medicine, Recep Tayyip Erdogan University Training and Research Hospital, Rize, Turkey
$^b$ Department of Radiology, Agrı State Hospital, Agrı, Turkey
$^c$ Department of Thoracic Medicine, Sanlıurfa Viranşehir State Hospital, Sanlıurfa, Turkey
$^d$ Department of Radiology, Karaman State Hospital, Karaman, Turkey
$^e$ Department of Thoracic Medicine, Agrı State Hospital, Agrı, Turkey

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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.$^{1,2}$ Blood clots may exist when vascular endothelium is damaged by paravenous injection, high flow of materials, location of needle tip, or aspiration of blood.$^{1}$ 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-cyttoplasmic granules by exocytosis.$^{2}$ 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.$^{2,3}$ The activation of platelets by thrombin induces a three- to five-fold increase in glucose transport via GLUT-3.$^{3}$ 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 endothelium injury may account for bilateral multiple FDG microembolisms.

* Corresponding author.
E-mail address: dr.serkan81@hotmail.com (S. Gungor).

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Conflict of interest

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

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