Interesting images

Incidentally detected right-to-left intracardiac shunt with Eisenmenger syndrome on V/Q SPECT/CT

Detección incidental en una SPECT/TC V/Q de un cortocircuito derecha-izquierda intracardíaco con síndrome de Eisenmenger

S. Gungor a,⁎, M. Aras b, F. Novruzov c, M. Sunbul d, F. Dede e

a Department of Nuclear Medicine, Recep Tayyip Erdogan University Faculty of Medicine, Rize, Turkey
b Department of Nuclear Medicine, Bulent Ecevit University School of Medicine, Zonguldak, Turkey
c Department of Nuclear Medicine, Azerbaijan National Institute of Oncology, Baku, Azerbaijan
d Department of Cardiology, Marmara University School of Medicine, Istanbul, Turkey
e Department of Nuclear Medicine, Marmara University School of Medicine, Istanbul, Turkey

A 50-year-old female patient with atrial septal defect (ASD) and Eisenmenger syndrome (ES) was referred to V/Q scintigraphy due to sudden deterioration of her complaints and suspicion of pulmonary embolism. According to our departmental protocol, first ventilation (Technegas) and perfusion (99mTc-MAA) SPECT/CT images were obtained on the same day. It showed nonventilating and severely hypoperfused left lung and a subsegmental match V/Q defect in the inferior lobe of right lung. In addition, the perfusion SPECT/CT images show uptake in brain, thyroid, myocardium, and kidneys due to right-to-left shunt, confirmed by echocardiography, consistent with ASD and ES (Fig. 1). ES is a cardiac disease caused by ventricular or atrial septal defect and accompanied by pulmonary hypertension. Initially the direction of the shunt is from left to right. However, by the progressive increase in the pulmonary pressure, right-to-left shunt predominates.1 Extrapulmonary accumulation of 99mTc-macroaggregate of albumin (MAA) is uncommonly seen on perfusion lung imaging. It takes place when the agent bypasses the lungs due to a right-to-left cardiac or pulmonary shunt, shunted to the portal vein before reaching the right atrium and ventricle of the heart, and degraded to a submicron-particle size. When a pharmaceutical problem is excluded, extrapulmonary uptake indicates unusual hemodynamics with a shunt.2,3 A right-to-left shunt of more than 10% is easily seen on the scan by recognizing activity in organs with high systemic blood flow such as the brain, and kidneys. In addition, myocardial 99mTc-MAA uptake, which is even more rare entity and seems to be a reliable imaging sign of a right-to-left shunt, can not be readily apparent on the scan due to low systemic blood flow and normal left pulmonary 99mTc-MAA uptake. In our case, the severe hypoperfusion of the neighboring left lung and fusion SPECT/CT images made it easier for us to depict myocardial 99mTc-MAA uptake.
Fig. 1. (A) Transaxial V/Q SPECT/CT scintigraphy showed nonventilating and severely hypoperfused left lung (V: Ventilation; P: Perfusion). (B) Coronal SPECT/CT and planar images show uptake in brain, thyroid, myocardium, and kidneys due to right-to-left shunt, confirmed by echocardiography, consistent with ASD and ES (Fig. 1).

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

References