Dual-Energy Computed Tomography with Material Decomposition: Before and after Thrombolysis in Massive PTE

Paula de Castro Carvalho Gorgulho, Bruno Soares da Silva Rangel, Sicilia Pacheco e Silva, Ilan Gottlieb, Gustavo Luiz Gouvêa de Almeida Junior

Casa de Saúde São José, Rio de Janeiro, RJ – Brazil

Female patient, 31 years old, on oral contraceptives, admitted to the emergency department with dyspnea after syncope (third episode in one month). Laboratory tests revealed 6650 D-dimer. Dual-Energy Computed Tomography was done. Spectral imaging with material decomposition, iodine reconstruction and water suppression (perfusion imaging) revealed hypoattenuation suggesting oligaemia in most of the left lung and part of the upper, middle and lower lobes of the right lung. After thrombolysis, clear perfusion improvement in the lower and upper left and upper right lobes, with slight improvement in the right middle lobe. The dual-energy spectral imaging computed tomography protocol allows reconstruction of iodine images with water subtraction, which makes it possible to view the flow and evaluate the perfusion of the pulmonary parenchyma. This may provide greater sensitivity in the detection of small thrombi, especially subsegmental thrombi, which may not be seen in an ordinary angiography scan. However, more scientific evidence is still needed.

Authors' contributions

Research creation and design: Gorgulho PCC, Almeida Jr GLG; Data acquisition: Gorgulho PCC, Rangel BSS, Silva SP, Gottlieb I; Data analysis and interpretation: Gorgulho PCC, Rangel BSS, Silva SP, Gottlieb I, Almeida Jr GLG; Manuscript drafting: Gorgulho PCC, Rangel BSS, Silva SP, Gottlieb I, Almeida Jr GLG; Critical revision of the manuscript as for important intellectual content: Gorgulho PCC, Almeida Jr GLG.

Keywords

Pulmonary Embolism/diagnostic imaging; Perfusion/instrumentation; Tomography, X-Ray Computed.

Mailing Address: Paula de Castro Carvalho Gorgulho •
Casa de Saúde São José - Unidade Coronariana
Rua Macedo Sobrinho, 21. Postal Code 22271-080, Humaitá, Rio de Janeiro, RJ – Brazil
E-mail: paulagorgulho@hotmail.com
Manuscript received September 6, 2017; revised October 5, 2017; accepted November 21, 2017

Potential Conflicts of Interest

There are no relevant conflicts of interest.

Sources of Funding

This study had no external funding sources.

Academic Association

This study is not associated with any graduate programs.

DOI: 10.5935/2318-8219.20180009

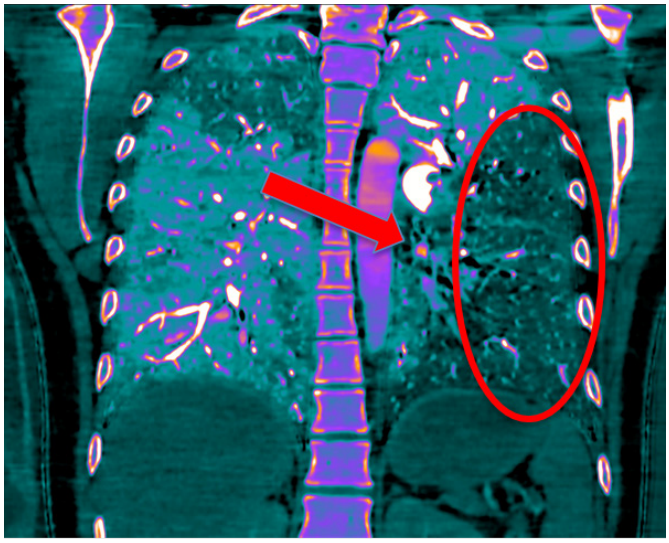

Figure 1 – *Pre-trombolysis perfusion.*

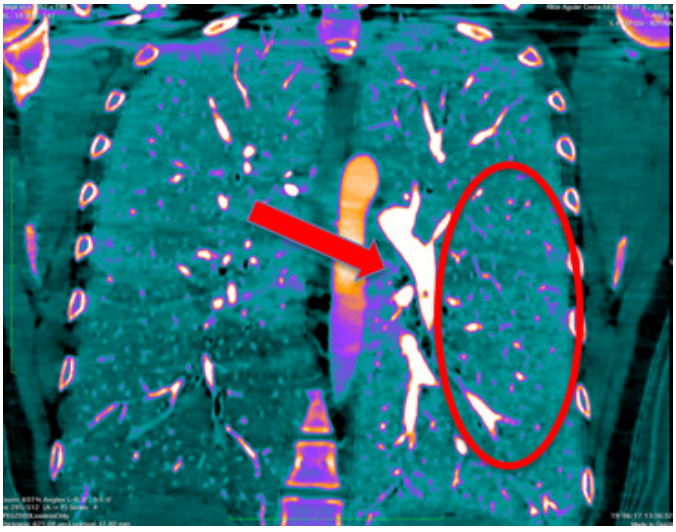

Figure 2 – *Post-trombolysis perfusion.*