

Spectral Insights – Iodine mapping

“CTPA iodine mapping provides us with important functional information about the lung parenchyma in thromboembolism exams allowing for a more accurate lung diagnosis and reduces the need to perform additional exams.”



**Eduardo K. U.
Nunes Fonseca
MD, PhD**



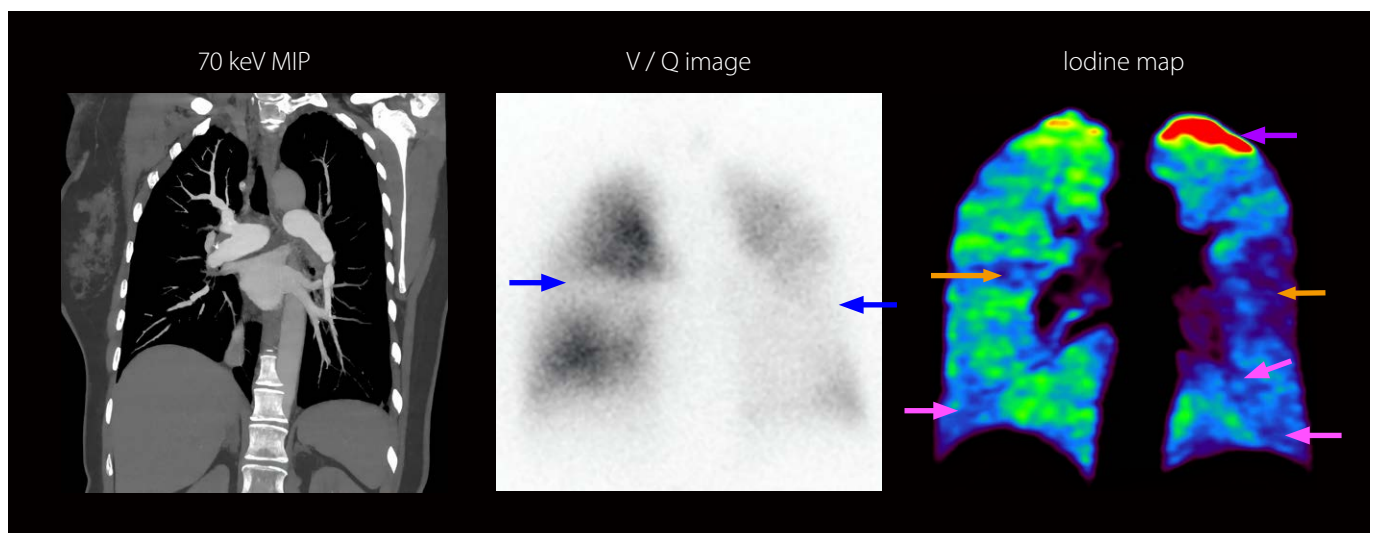
**Jacqueline k. N.
Matsumoto
MSc, PhD**

InCor – Heart Institute of the FMUSP Clinical Hospital, São Paulo, Brazil

Patient History

This 42-year-old man with a recent pulmonary thrombus underwent both a Ventilation (V) Perfusion (Q) scan and spectral computed tomography pulmonary angiography (CTPA) for assessment.

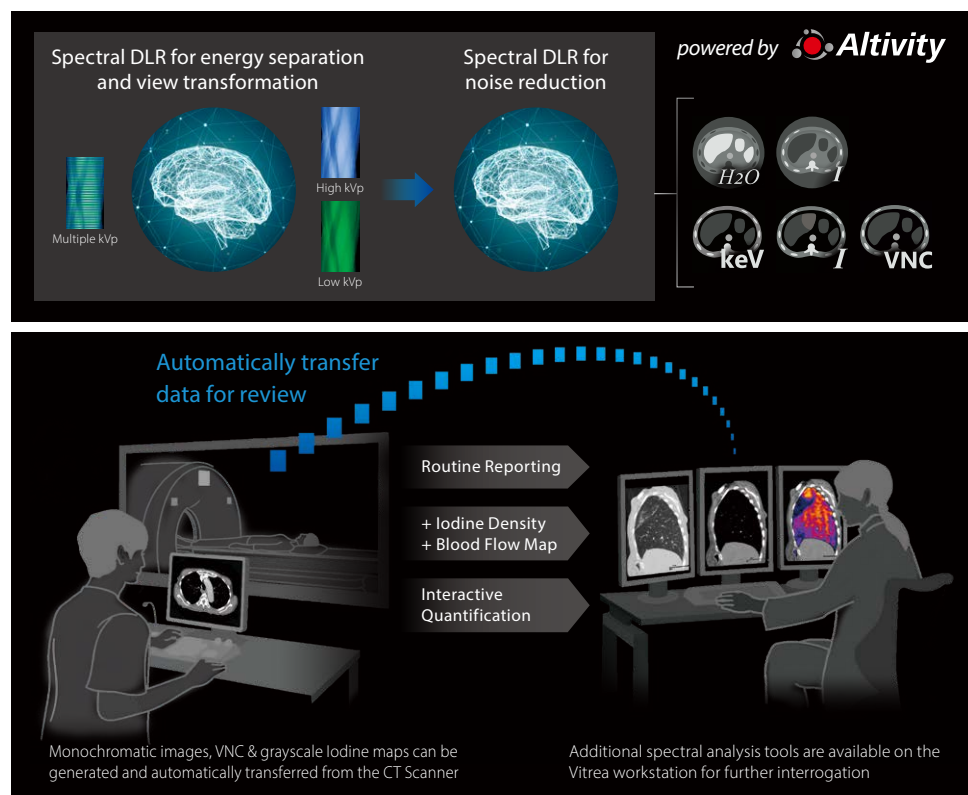
Result



According to doctors Fonseca and Matsumoto, the 70 keV MIP image demonstrates chronic pulmonary thromboembolism (CTPE) signs, such as organized and eccentric chronic thrombus in both interlobar arteries of the lungs, along with abrupt vessel narrowing and luminal bands in the left lower lobar artery. The V / Q image, considered the technique of choice for CTPE screening¹, shows multisegmented perfusion defects (blue arrows). The iodine map reveals the same multisegmented hypoperfused areas as the V / Q image (orange arrows) and additionally highlights the involvement of basal segments in both the lower lobes and in the inferior lingular segment (pink arrows), confirming findings seen in the 70 keV MIP image. The hyper dense area at the apex of the left lung is due to contrast still being injected and passing through through the subclavian vein at the time of acquisition (purple arrow).

Technology

Canon's Spectral CT technology incorporates rapid kV switching and patient-specific mA modulation with Deep Learning Reconstruction (DLR). DLR process multi-energy raw data, achieving precise energy separation and noise reduction resulting in clear spectral images. Output images can be sent directly to PACS, and advanced image analysis can be performed on the Spectral Analysis application on the Vitrea Platform.



Key Benefits

- Detect local perfusion differences
- Display local iodine distribution
- Detect/rule out contrast enhancement

Acquisition

Scanner Model:

Aquilion ONE / PRISM Edition

Scan Mode: Ultra Helical Spectral

Collimation: 0.5 mm × 80

Exposure: Rapid kV Switching, SURE Exposure

Conclusion

Based on the result of this study and others, Dr. Fonseca and Matsumoto have adopted Spectral CT and iodine mapping for all their CTPA exams. This method combines anatomical and perfusion assessment in a single study, improving diagnostic accuracy and potentially reducing the need for additional diagnostic tests. Consequently, by eliminating the need for additional imaging such as V/Q image, it may also lower the overall costs and eases workflow burden.

1. Dounes G, et al. Dual-energy CT perfusion and angiography in chronic thromboembolic pulmonary hypertension: diagnostic accuracy and concordance with radionuclide scintigraphy. Eur Radiol. 2014



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