CT / Case Study

Spectral Myocardial Computed Tomography Perfusion in diffuse coronary atherosclerosis disease patient

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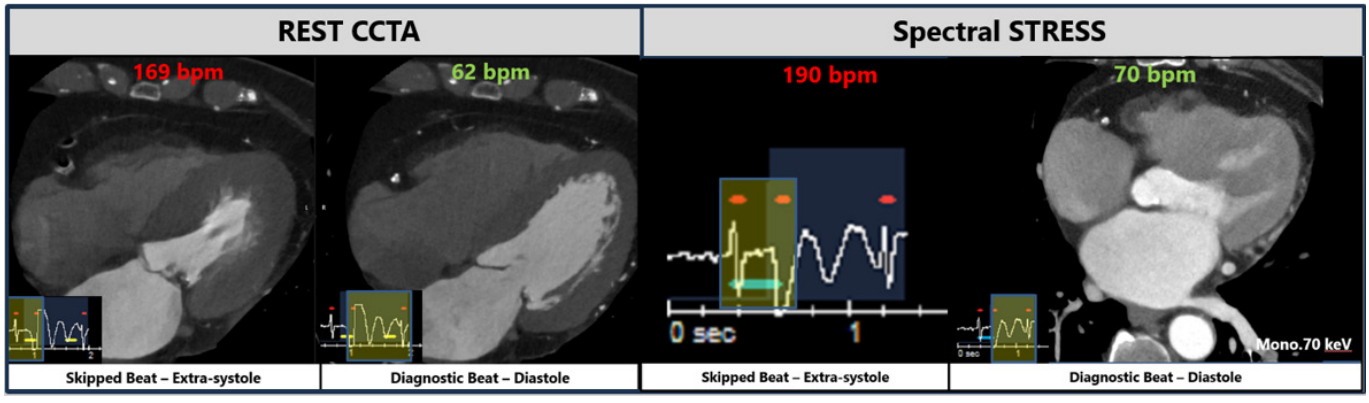
"Spectral Static Perfusion is a reliable and fast technique that provides valuable information about ischemic disease caused by coronary artery diseases (CAD).

The combination of spectral volumetric one-beat scanning with the Arrhythmia Detection Algorithm enables spectral imaging to maintain superior diagnostic accuracy, even in challenging arrhythmic cases like atrial fibrillation." Dr. Gemma Burcet

Patient history

A 73-year-old female patient with a positive exercise stress test underwent coronary CT angiography (CCTA) to evaluate the possible presence of coronary artery diseases and myocardial perfusion. Imaging was performed with wide-area detector CT in a single heartbeat.

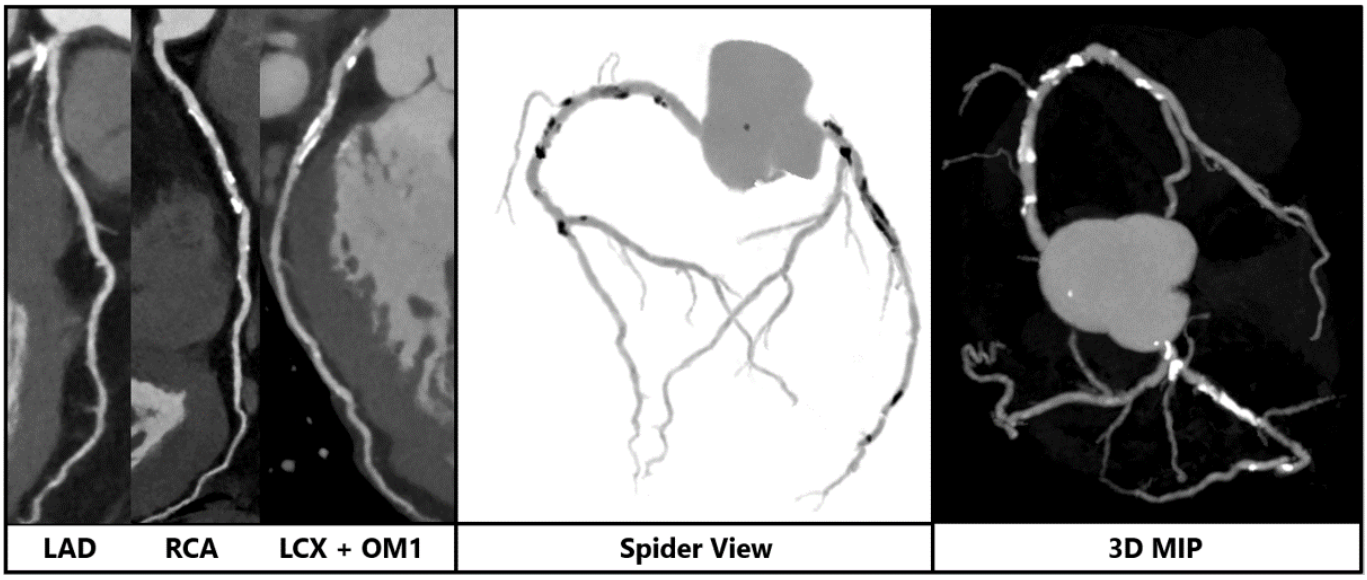
The ECG trace showed systematic extra systolic beats.



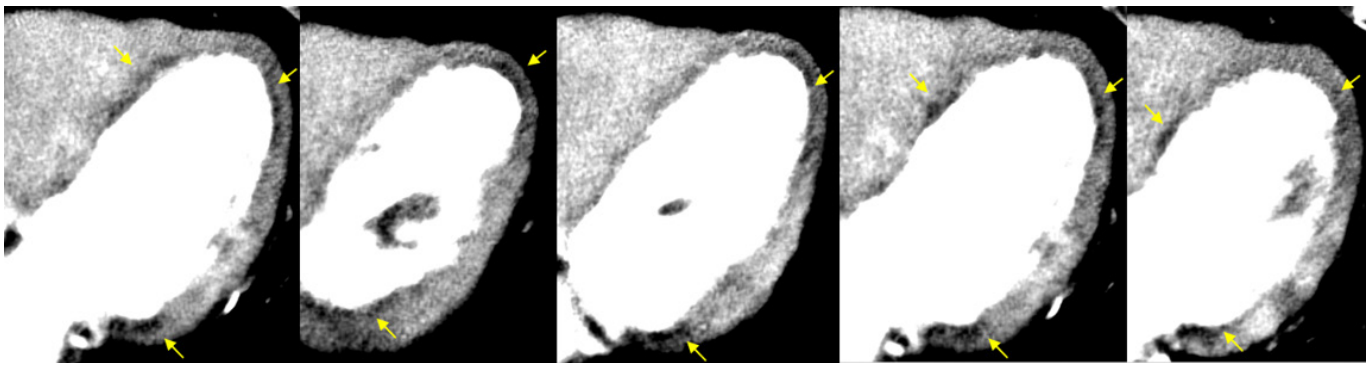
The one-beat scan successfully bypassed the extra systolic beat that occurred during the acquisition and captured a subsequent normal cardiac cycle, resulting in a successful examination.

Results

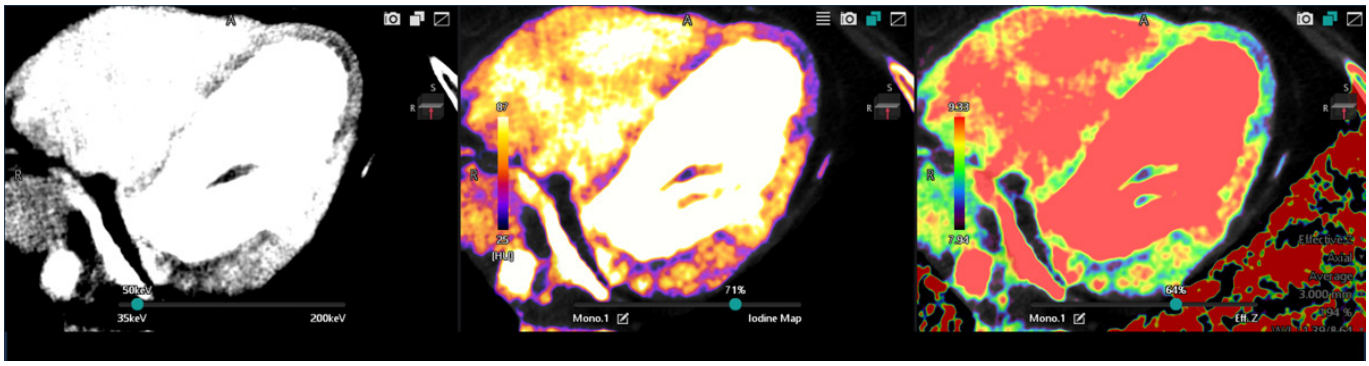
Diffuse atherosclerosis disease can be seen on the right coronary artery (RCA), left circumflex artery (LCX) and on the first obtuse marginal (OM1) on the CCTA exam.



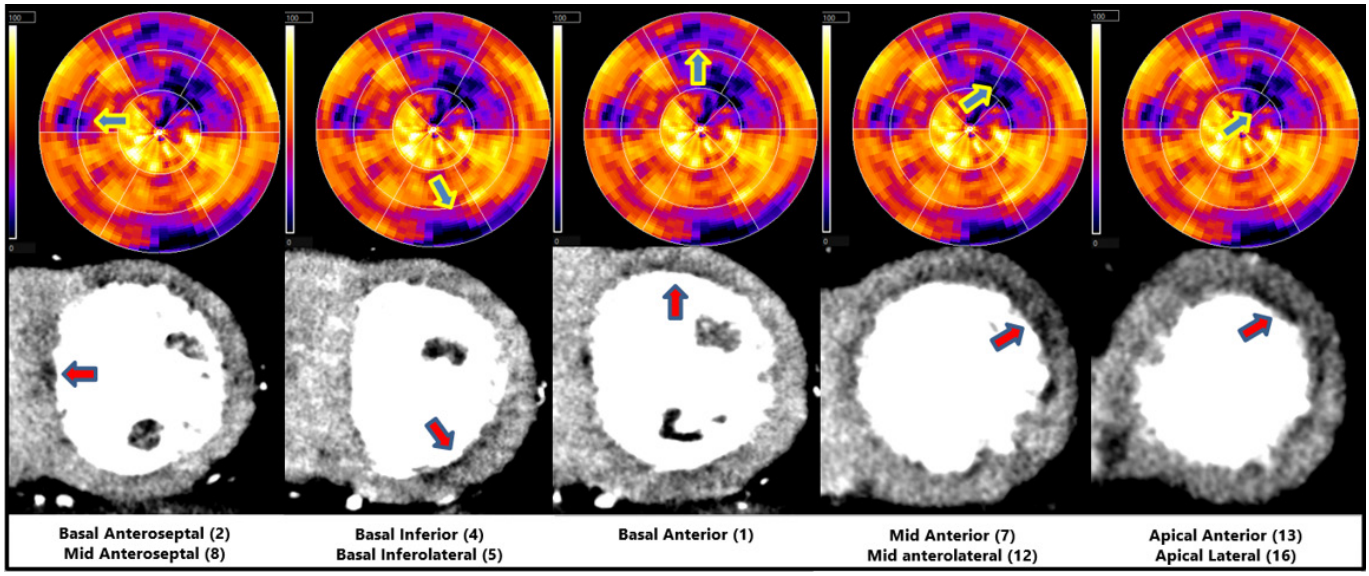
Spectral Stress imaging at 50 keV (axial monochromatic images) shows ischemic endocardial areas.



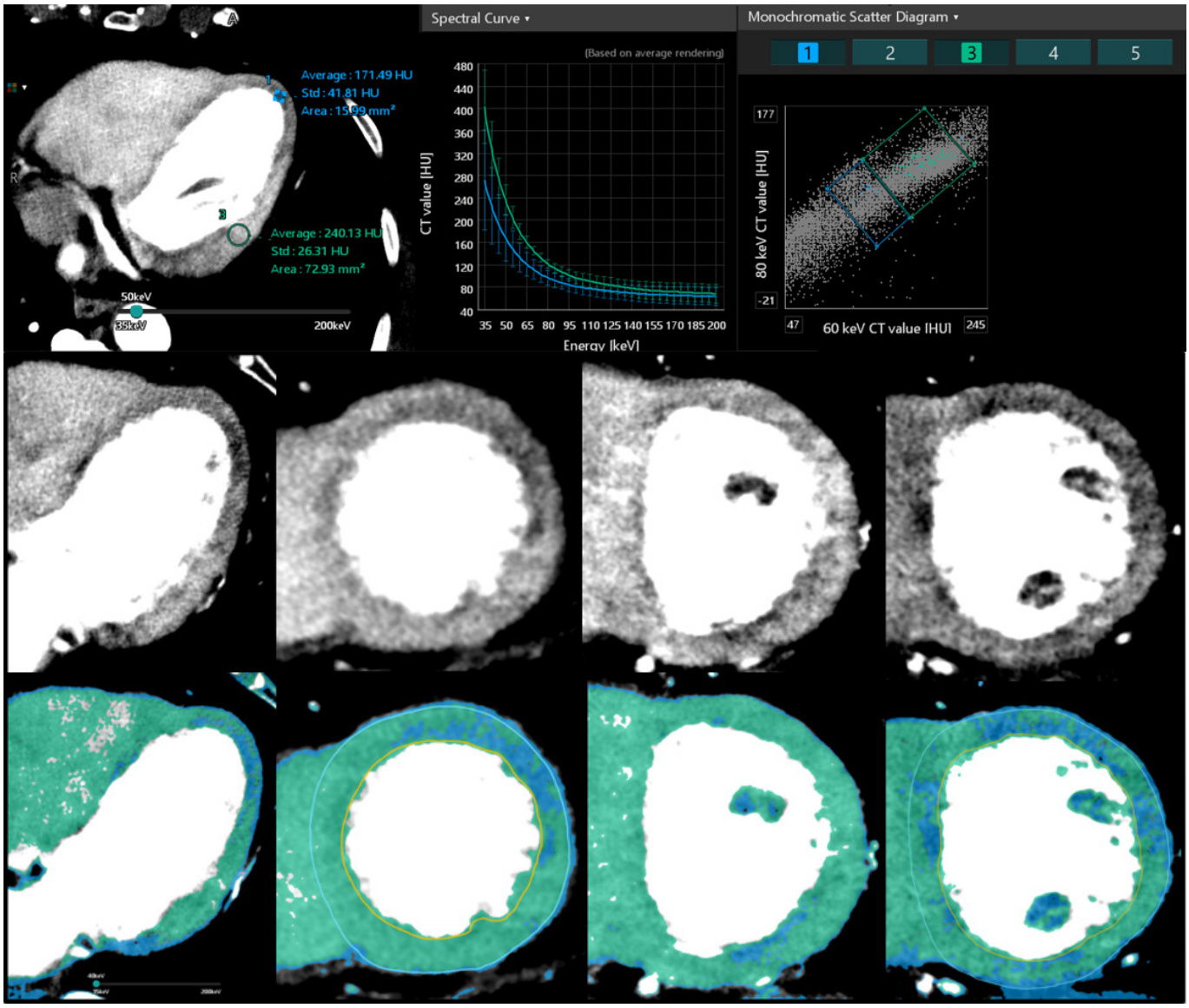
The iodine map and Eff.Z number map provide improved delineation of ischemic regions.



Based on the monochromatic images, a more accurate evaluation of the Transmural Perfusion Ratio (TPR) was obtained.



The mono-scatter diagram provides clearer differentiation between normal myocardium and ischemic regions.



Conclusions

Static myocardial perfusion benefits from spectral acquisition, providing more accurate Transmural Perfusion Rations (TPR) values, improved delineation of ischemic regions, and a clear differentiation between normal myocardium and ischemic regions.

Additionally, the wide-area detector one-beat scan is capable of bypassing arrythmias, enabling spectral cardiac imaging even in cases where an irregular heart rate would typically be a contraindication for the examination.

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