CT Angiography with Reduced Radiation - The Dawn of a New Era
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Clinical History
A 46-year-old woman with a history of supraventricular tachycardia, benign positional vertigo, and a meningioma was admitted after being found unresponsive at the bottom of a stairway. During her index hospitalization, no arrhythmias were noted; and a technically difficult transthoracic cardiac ultrasound revealed mild to moderate mitral regurgitation, inferior hypokinesis, and an estimated left ventricular ejection fraction of 44%. The initial neurological workup was unremarkable, and the patient refused any further cardiovascular workup. Following discharge, she consented to a cardiac CTA evaluation, and was scanned at MGH with a latest generation high-pitch, dual source (“Flash”) CT scanner.

Findings
Cardiac CTA revealed no evidence for anomalous coronary arteries. There was right coronary artery dominance, without evidence of any coronary artery disease. There was no evidence of aortic dissection or aneurysm, and her pulmonary vasculature was unremarkable.

Discussion
The evaluation of coronary arteries by cardiac CTA in patients with a cardiomyopathy of unclear etiology is an established indication and has a negative predictive value of 98% in excluding coronary artery disease as a potential etiology. Our patient was scanned in the “Flash” mode using the new high-pitch CT scanner, which has a scanning speed of up to 43 cm/s and a temporal resolution of 75 ms. Therefore, an entire chest examination can be completed in just 0.6 seconds. The “Flash” mode can be used reliably in patients with a heart rate of less than 65 and regular rhythm. Our patient’s examination lasted 0.43 seconds, and her total radiation exposure was 1.07 millisieverts (mSv), compared to an average effective dose of 7 mSv for a diagnostic cardiac catheterization and an average effective dose of 15.6 mSv for a myocardial perfusion imaging study (SPECT).

REFERENCES