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## CARDIOVASCULAR FLASHLIGHT

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### Low-dose computed tomography coronary angiography and myocardial perfusion imaging: cardiac hybrid imaging below 3mSv

Bernhard A. Herzog<sup>1</sup>, Lars Husmann<sup>1</sup>, Ulf Landmesser<sup>1</sup>, and Philipp A. Kaufmann<sup>1,2\*</sup>

<sup>1</sup>Cardiovascular Center, Raemistrasse 100, University Hospital Zurich, Raemistrasse 100, 8091 Zurich, Switzerland and <sup>2</sup>Zurich Center for Integrative Human Physiology (ZIHP), University of Zurich, Zurich, Switzerland

\* Corresponding author: Tel: +41 44 255 4196, Fax: +41 44 255 4414, Email: pak@usz.ch

Cardiac hybrid imaging allows us combining the morphological information of CT coronary angiography (CTCA) and the functional information of myocardial perfusion imaging (MPI) in the evaluation of coronary artery disease (CAD). However, the effective radiation dose to patients is often an issue of discussion and may cause hesitation to hybrid imaging.

We report on a 65-year-old man (BMI: 24.6 kg/m<sup>2</sup>) with atypical chest pain, without cardiovascular risk factors and no known CAD, who was referred for cardiac check-up.

The exercise test showed significant ST-depressions over the anterior leads. For further assessment, a low-dose CTCA (mean heart rate: 57 per minute with 10 mg metoprolol i.v.), using prospective ECG-triggering, and a low-dose 1-day gated adenosine stress SPECT-MPI with 173 MBq <sup>99m</sup>Tc-tetrofosmin were performed and fused. The SPECT-MPI was reconstructed with a dedicated new iterative reconstruction software for low-count scans, including resolution recovery ('Evaluation for Cardiac', GE Healthcare, WI, USA). CTCA provided excellent image quality in all coronary segments at an effective radiation dose of 1.46 mSv, while the respective value for the MPI was 1.16 mSv. Thus, effective radiation dose for hybrid imaging was <3mSv. Fused SPECT-CT demonstrated a perfusion defect at stress in the anterior myocardium (Panel A, black arrows), corresponding to the total occlusion (Panel A, white arrow) in the proximal left anterior descending (LAD) coronary artery. The latter was confirmed by the invasive coronary angiography (ICA) (Panel B) for which the patient was referred without necessity of resting perfusion as wall motion abnormality was ruled out by gated stress SPECT excluding a myocardial scar. The diagnostic ICA confirmed an occlusion of the LAD, which was successfully re-canalized in the same session. This example illustrates that latest advances in non-invasive cardiac imaging allow comprehensive CAD as assessment by hybrid SPECT-CT imaging at radiation dose below 3 mSv.

