A 58-year-old man was referred to our center for angiographic evaluation of unstable anginal complaints. Selective coronary angiography revealed 3-vessel disease.

Multislice CT angiography (Somatom plus 4 Volume Zoom, Siemens AG), a new noninvasive technique to image the heart and coronary arteries, was also performed (Figure). The entire heart was scanned within 1 single breath-hold after injection of a contrast medium (iomeprol, 350 mg/mL, 144 mL at 4 mL/s). By use of retrograde ECG gating, a 3D volume consisting of thin slices can be reconstructed from the CT data during a preselected period (250 ms) within the RR interval of each cardiac cycle. 3D data sets were acquired during 20 different reconstruction intervals equally distributed throughout the cardiac cycle.

These 20 3D data sets, each representing a different cardiac phase, were further processed on a graphic workstation (Indigo 2, SGI) with 3D volume-rendering software (Voxel View, Vital Images). By manual segmentation, the thoracic wall was removed from each volume. From these volumes, a large series of movie frames was recorded, like photographs, and ordered according to their phase. By running these frames at a speed corresponding to the original heart rate, we could create a 4D representation of the beating heart (Movie).

![Selective coronary angiogram of left coronary artery (90° left anterior oblique view). Midsegment of left anterior descending coronary artery (LAD, arrowheads) and proximal circumflex artery are occluded and distal parts are filled by collateral vessels. Significant lesions can be observed in second diagonal branch (D2, arrow) as well.](http://circ.ahajournals.org/)

From the Department of Cardiology, Thoraxcenter (K.N., B.R., P.J.d.F.), and Department of Radiology, Daniel den Hoed Clinic (P.v.O., M.O.), Rotterdam University Hospital, Rotterdam, Netherlands.

Movie can be found Online at [www.circulationaha.org](http://www.circulationaha.org)

Reprint requests to Koen Nieman, MD, Catheterization Laboratory, Thoraxcenter BD 406, PO Box 2040, 3000 CA Rotterdam, Netherlands. E-mail koennieman@hotmail.com

The editor of Images in Cardiovascular Medicine is Hugh A. McAllister, Jr, MD, Chief, Department of Pathology, St Luke’s Episcopal Hospital and Texas Heart Institute, and Clinical Professor of Pathology, University of Texas Medical School and Baylor College of Medicine.

_Circulation_ encourages readers to submit cardiovascular images to the Circulation Editorial Office, St Luke’s Episcopal Hospital/Texas Heart Institute, 6720 Bertner Ave, MC1-267, Houston, TX 77030.

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Four-Dimensional Cardiac Imaging With Multislice Computed Tomography
Koen Nieman, Peter van Ooijen, Benno Rensing, Matthijs Oudkerk and Pim J. de Feyter

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