In our study published in a recent issue of JACC (1) we demonstrated that the new 64-slice computed tomography (CT) technology enables one to identify and rule out atherosclerotic coronary lesions with high accuracy irrespective of the stenosis severity. Because of restricted spatial resolution, this technology does not yet allow an exact stenosis quantification. However, a rough classification in mild, moderate, and high-grade stenosis can be done reliably. In their letter to the editor, Wijpkema et al. addressed a very important issue—the functional aspect of coronary lesions, which is critical for the treatment decision. Neither invasive angiography nor noninvasive angiographic tests like 64-slice CT provide such information.

Multi-slice CT (MSCT) angiography, however, has other unique advantages. Because approximately 40% of coronary catheterizations are solely diagnostic procedures and are not followed by interventions, an obvious need arises for diagnostic tools that would allow improvement of the triage of patients. Numerous studies have demonstrated the high accuracy of MSCT angiography to rule out coronary disease (2,3). Consequently, this technique has great potential to act as a filter before invasive diagnostic procedures, although some limiting factors have to be considered: MSCT angiography is always associated with the administration of contrast agent and the exposure to radiation. Thus, candidates for an MSCT examination have to be selected carefully. In patients with typical angina pectoris symptoms, the pretest likelihood for the presence of a hemodynamically relevant stenosis is already >80%; thus, MSCT angiography is not likely to add incremental diagnostic information. The ideal candidate would be the patient with atypical symptoms and an intermediate to low pretest likelihood. In a possible diagnostic workup of these patients, MSCT angiography may rule out coronary artery disease (CAD) in the majority of cases, thus saving additional diagnostic procedures (including invasive procedures). In patients with MSCT evidence of significant lesions, noninvasive stress testing (magnetic resonance, single-photon emission computed tomography, position emission tomography) will be required. Only patients with evidence for a hemodynamically relevant lesion will then undergo coronary catheterization. Controlled prospective studies applying that algorithm are currently underway, and it is hoped this will demonstrate the benefit compared to the traditional diagnostic workup.

In addition to the exclusion of coronary stenoses, MSCT provides other unique information. In contrast to invasive coronary angiography, MSCT angiography allows for identification of nonobstructive atherosclerotic lesions located in the vessel wall. Thus, for the first time compositional aspects of CAD can be identified in the preclinical stage, potentially allowing for an earlier initiation of antiatherosclerotic modifications.

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Werner G. Daniel, MD, FESC, FACC
Department of Internal Medicine II (Cardiology)
University of Erlangen-Nürnberg
Ulmenweg 18
91054 Erlangen
Germany
E-mail: stephan.achenbach@med2.med.uni-erlangen.de

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REPLY

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Alexander W. Leber, MD
Andreas Knez, MD
Alexander Becker, MD
Christoph Becker, MD
Peter Boekstegers, MD
University of Munich
Klinikum Grosshadern
Division of Cardiology
Marchioninistrasse 15
Munich, 81377
Germany
E-mail: aleber@med.uni-muenchen.de

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