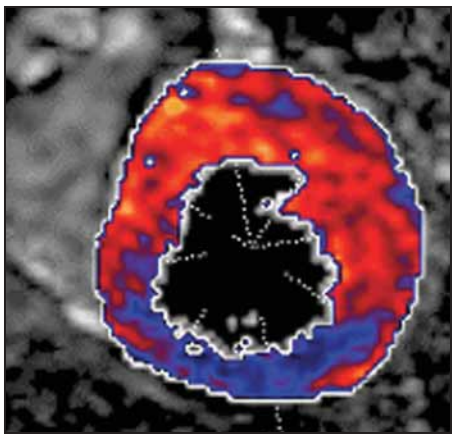

COURTESY DR. JUERG SCHWITTER

MR image shows reduced blood supply to the heart muscle (blue area).

MR Imaging Beats SPECT in Large Trial

BY BRUCE JANCIN
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STOCKHOLM — Magnetic resonance perfusion imaging proved markedly superior to single-photon emission computed tomography for the detection of coronary artery disease in the largest comparative trial to date, Juerg Schwitter, M.D., reported at the annual congress of the European Society of Cardiology.

Results of the Magnetic Resonance Imaging for Myocardial Perfusion Assessment in Coronary Artery Disease Trial (MR-IMPACT) prompted speculation that single-photon emission computed tomography (SPECT) will gradually fade from the cardiac diagnostic imaging scene.

MR-IMPACT involved 241 patients with known or suspected coronary artery disease (CAD) studied by both MR first-pass perfusion imaging and SPECT at 5 U.S. and 13 European medical centers.

All participants also underwent quantitative coronary angiography as the standard of comparison. The MR and SPECT data were interpreted by three blinded reviewers each, with scoring of 16 segments per heart, explained Dr. Schwitter of the University of Zurich.

MR displayed 91% sensitivity and 67% specificity for detection of patients with single-, double-, or triple-vessel CAD, compared with 74% and 57%, respectively, for SPECT.

For double- or triple-vessel disease, MR had 90% sensitivity and 67% specificity, while SPECT showed 76% sensitivity and 57% specificity. Thus, while MR missed 1 in 10 cases of CAD, SPECT missed 1 in 4. Artifacts made a diagnosis impossible in 5% of the MR studies.

The MR perfusion technique employed a contrast agent called Omniscan (gadodiamide). Omniscan has been on the U.S. market since the mid-1990s for central nervous system MR and is at present under review by the Food and Drug Administration and European authorities for a proposed cardiac MR indication.

The cardiac MR perfusion technique was safe. It was associated with only a single adverse event, a case of angina that rapidly resolved, according to Dr. Schwitter.

He said that physicians too often adopt a reactive strategy to heart disease, waiting to act until after symptoms announce its presence. He sees MR perfusion imaging as occupying a key role in a more proactive management strategy that detects CAD in its early stages.

Discussant Udo Sechtem, M.D., said he found the MR-IMPACT results believable, particularly in light of supportive data from animal studies that highlighted SPECT's limited accuracy in detecting moderate stenoses (Circulation 2004; 110:58-65).

SPECT is not a patient-friendly technique. The test entails a substantial radiation exposure, takes about 4 hours, and requires two trips to the nuclear medicine facility, often on separate days.

In contrast, MR first-pass perfusion imaging is fast and radiation free. But it requires a relatively healthy patient. For example, it can't be done in patients with a pacemaker.

The necessity for two breath holds makes many individuals with heart failure or pulmonary disease poor candidates, added Dr. Sechtem, a cardiologist at Robert Bosch Hospital, Stuttgart, Germany.

He predicted that the multibillion-dollar-per-year perfusion imaging business will witness a gradual shift from SPECT to cardiac MR in response to MR-IMPACT and other studies. But it won't happen overnight.

"SPECT is definitely not a technique to do away with immediately. It is supported by a large body of evidence showing that it's clearly applicable, very robust, valid, and it includes a lot of prognostic data," Dr. Sechtem observed.

MR-IMPACT was sponsored by GE Healthcare, which markets Omniscan. To demonstrate the technique's versatility, the study included MR scanners made by all of the major manufacturers. ■

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