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NEWS

RSNA Press Release

3-D MRI Technique Helps Radiologists Detect High-Risk Carotid Disease

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At A Glance

- Three-dimensional MRI can be used to noninvasively analyze tissue within the carotid artery wall and detect abnormal bleeding.
- Bleeding in the carotid artery wall may lead to a stroke.
- The 3-D MRI technique adds only a few minutes to an MR angiography exam.

OAK BROOK, Ill. — Canadian researchers have used three-dimensional magnetic resonance imaging (3-D MRI) to accurately detect bleeding within the walls of diseased carotid arteries, a condition that may lead to a stroke. The results of the study published in the October issue of *Radiology* suggest the technique may prove to be a useful screening tool for patients at high risk for stroke.

When major arteries are affected by atherosclerosis, fatty deposits, or plaques, accumulate on the inner lining of the vessel walls. Progression of the disease over time leads to narrowing, restricting blood flow or becoming completely blocked.

Until recently, scientists believed that this narrowing, called stenosis, was responsible for most heart attacks or strokes. But new studies have identified the composition of complicated plaques as being a major cause of vascular events and deaths. These complicated plaques are characterized by surface ulcerations, blood clots and bleeding into the vessel wall.

"There's been a major change in our research," said Alan R. Moody, F.R.C.R., F.R.C.P., of the University of Toronto. "We now know that the composition of carotid artery plaque is likely to be more predictive of future stroke events than the amount of stenosis in the vessel."

In the study, conducted at the Sunnybrook Health Sciences Centre in Toronto, researchers performed 3-D MRI on the carotid arteries of 11 patients, age 69 to 81. Complicated plaques were then surgically removed from the patients' diseased arteries and analyzed under a microscope.

The research team found strong agreement between the lesions identified by MRI as complicated plaques and the microscopic analysis of the tissue samples.

"With high spatial resolution 3-D MRI, we are able to noninvasively analyze the tissue

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within the artery wall and identify small bleeds within rupture-prone plaques that may put patients at risk for future stroke," Dr. Moody said.

According to Dr. Moody, 3-D MRI is a tool that is ideally suited to screen high-risk patients for complicated carotid plaques and to monitor the effects of interventions designed to slow the progress of the atherosclerotic disease. The technique is easy to perform and interpret and takes only a few minutes when added to an MR angiography study, he said.

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"Intraplaque Hemorrhage: In Vivo 3D High-Spatial Resolution MR Imaging." Collaborating with Dr. Moody were Richard Bitar, M.D., M.Sc., General Leung, M.Sc., Sean Symons, M.D., F.R.C.P.C., Susan Crisp, R.Tn.N.M, R.T.M.R., Jagdish Butany, M.B.B.S., M.S., F.R.C.P.C., Corwyn Rowsell, M.D., F.R.C.P.C., Alexander Kiss, Ph.D., Andrew Nelson, R.T.R., R.T.M.R., Robert Maggisano, M.D., F.R.C.P.C. Journal attribution requested.

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