

Electron-Beam CT Deemed Best for Evaluating Adult Patients With Congenital Defects in the Arteries of the Heart

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X-ray Angiography Falls Short in Critical Finding

(BETHESDA, MD)—Electron-beam computed tomography (EBCT) is more accurate than conventional catheter angiography for identifying which adult patients face the greatest risk of sudden death from congenital abnormalities in the arteries supplying blood to the heart, according to a study in the September 2005 issue of *Catheterization and Cardiovascular Interventions: Journal of the Society for Cardiovascular Angiography and Interventions*.

The study found that both EBCT and conventional x-ray angiography were able to detect the abnormalities—for example, a left coronary artery originating from the right side of the aorta, or vice versa—but EBCT trumped angiography in more than one-third of cases when determining whether the artery traveled perilously between the aorta and pulmonary artery, or followed a safer path around the two “great vessels.”

An artery that passes between the aorta and pulmonary artery makes a sharp bend at its origin. In addition, it can be squeezed between the great vessels as the heart beats. Under the right conditions—such as strenuous athletic activity—blood flow through the artery may be blocked, causing a heart attack or even sudden death.

“The most crucial clinical question is whether the artery is coursing between the aorta and pulmonary artery. Angiography did not always give us the correct answer, but it was very easy to tell using EBCT,” said Dr. Esat Memisoglu, an assistant professor of radiology at St. Louis University Hospital.

The study, which was conducted at a heart hospital and imaging center in Istanbul, Turkey, involved 28 adults who had had conventional x-ray angiography for chest pain or shortness of breath and later underwent an EBCT study. In half of the patients, angiography showed a congenital abnormality in the coronary arteries. The other 14 patients served as a control group.

The radiologists who interpreted the EBCT studies were not informed of the results of the angiographic study. In 5 of 14 cases, EBCT disagreed with angiography when characterizing the pathway the abnormal artery followed between, or around, the great vessels. Later, joint review by the cardiologist and radiologist concluded the EBCT findings to be correct.

In addition to its greater accuracy, EBCT has other key advantages over conventional angiography. Dr. Memisoglu said. The scan can be completed in 30 seconds or less. It requires only an intravenous injection of x-ray dye, rather than passage of a catheter from a groin artery into the heart. The radiation dose is low. Image detail is good. And, with the touch of a button, it is possible to produce stunning three-dimensional images of the heart that can be viewed from any angle. In addition, unlike some other noninvasive imaging methods, EBCT captures images so quickly it is not necessary to give the patient medication to slow the heart rate. Together, these factors make EBCT the best choice for examining patients suspected of having congenital abnormalities of the coronary arteries.

“If you are looking to better evaluate a coronary anomaly, EBCT is the best overall imaging method,” Dr. Memisoglu said.

Headquartered in Bethesda, Md., the Society for Cardiovascular Angiography and Interventions is a 3,400-member professional organization representing invasive and interventional cardiologists. SCAI's mission is to promote excellence in invasive and interventional cardiovascular medicine through physician education and representation, and advancement of quality standards to enhance patient care. SCAI was organized in 1976 under the guidance of Drs. F. Mason Sones and Melvin P. Judkins. The first SCAI Annual Scientific Sessions were held in Chicago in 1978.