IV digital subtraction angiography and coronary disease: Fact or fancy?

The role of intravenous digital subtraction angiography (IV DSA) in the practice of adult cardiology, particularly as it relates to coronary artery disease, has not been firmly established. The utility of this technique for evaluating patients with congenital heart disease, left-to-right intracardiac shunts, abnormalities of the aorta and aortic arch, left ventricular function at rest and with exercise, cardiomyopathic and neoplastic disease, and the pulmonary vascular bed has been described previously.[1] Mancini et al[2] have used digital techniques to evaluate coronary perfusion and coronary flow reserve.

See also Detrano et al (pp 129–135)

In this issue of the *Cleveland Clinic Journal of Medicine*, Detrano et al[3] describe the use of digital fluoroscopy and IV DSA to detect coronary artery disease in a select group of patients. Detrano and others[4] have previously described the use of digital fluoroscopy as a screening tool for coronary disease. In the current article, the authors not only use digital fluoroscopy, but have also used IV DSA ventriculography and IV DSA for evaluating thin patients with coronary artery disease. They obtained a sensitivity of 94% and a specificity of 89% by using these techniques.

As the authors indicate, the results of this study must be interpreted cautiously. The coronary circulation was not adequately visualized after injections in the right side of the heart in a number of subjects who were optimal candidates for almost any radiological procedure. The authors point out that this technique provides information primarily involving proximal coronary artery disease segments and does not adequately detect distally located disease. The technique is clearly better for evaluation of the right coronary artery; the left anterior descending artery was also visualized in most patients. It was disappointing that the left main trunk was seen in only 84% of the studies and that IV DSA does not allow optimum visualization of the circumflex artery.

The authors have restricted their study to thin subjects, which would eliminate many individuals referred to our institution for coronary arteriography. Their preliminary evaluation demonstrated that digital techniques may have diagnostic potential in patients with coronary disease, but future investigations must be undertaken to determine and clarify the real role of IV DSA in the day-to-day evaluation of adult patients with coronary artery disease. Studies should be instituted to compare DSA with tomographic stress thallium evaluation and the use of IV DSA techniques for unselected patients more representative of the normal spectrum of clinical subjects seen at The Cleveland Clinic Foundation.

Studies like the one presented in this issue provide a stimulus for new and innovative investigations. New techniques involving temporal filtration, high-resolution selective angiography, faster data-storage capabilities, extraction of physiologic parameters from DSA images with videodensitometry, multi-energy techniques with new algorithms, the use of automated beam compensation devices, and gated or phased matched masking will all improve digital images and allow further study in clinical practice.

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References

1. Moodie DS, Yiannikas J, eds. Digital Subtraction Angiography of the Heart and Lungs. New York, Grune & Stratton, 1986.
2. Mancini GBJ, Hodgson JM, LeGrand V, et al. Determination of the functional significance of coronary artery disease with digital subtraction angiography. [In] Moodie DS, Yiannikas J, eds. Digital Subtraction Angiography of the Heart and Lungs. New York, Grune & Stratton, 1986, pp 149–161.
3. Detrano R, Haggman DL, Simpfendorfer C, et al. Digital fluoroscopy and intravenous cardiac angiography for the detection of coronary artery disease in selected subjects: a feasibility study. Cleve Clin J Med 1988; **55**:129–135.
4. Detrano R, Simpfendorfer C, Day K, et al. Comparison of stress digital ventriculography, stress thallium scintigraphy, and digital fluoroscopy in the diagnosis of coronary artery disease in subject without prior myocardial infarction. Am J Cardiol 1985; **56**:434–440.

Cleve Clin J Med 1988; **55**:123