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Cardiovascular Radiology: Cardiac Angiography Wednesday Afternoon

QUANTIFICATION OF CORONARY STENOSES FROM DIGITAL IMAGES

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Digital imaging holds promise for quantifying coronary stenoses with low doses of contrast such as might be achieved with aortic root injections. To evaluate this possibility, both mask-mode subtraction (MMS) and interpolated background subtraction (IBS) were used to measure percent stenosis of aluminum coronary phantoms of known diameter. The coronary phantoms, which had a density equal to 20% Renografin 76, were placed inside a chest phantom and imaged using digital processing and storage. MMS was performed both with and without motion of the chest phantom mask to examine the effect of motion artifacts. IBS was performed on unsubtracted images. The results of 5 repetitive densitometric measures of percent stenosis are summarized below:

Actual	MMS		IBS
Stenosis	No Motion	Motion	
50%(2.0/4mm)	52.2±0.7	64.7±10.2	57.7±4.1
63%(1.5/4mm)	66.8±1.8	50.4±19.6	64.3±4.1
75%(1.0/4mm)	80.3±0.9	35.0±26.7	78.3±6.8

Thus, IBS and MMS both allow quantification of stenosis down to a minimum lumen diameter of 1.0 mm. The advantage of IBS over MMS is that it does not use temporal subtraction and, therefore, is not subject to motion artifacts.