

**Accuracy of Gated Cine-images for Differentiating Fixed Defects from Attenuation Artifacts in Tc-99m Tetrofosmin Myocardial SPECT: Comparison with Visual Grading, Projection Views and Ejection Fractions.**

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The differentiation of attenuation artifacts from true lesions is important in the interpretation of myocardial perfusion imaging. We investigated the degree of increased accuracy which gated cine-images provide over conventional methods of visual grading, reviewing projection views and left ventricular ejection fraction (LVEF) measurements in this regard.

Eighty three patients (M: 65, F: 18; mean age,  $58.2 \pm 9.0$ ) with equivocal fixed defects in stress-rest myocardial SPECT using Tc-99m tetrofosmin were included. Two independent observers graded confidence levels for true lesion over attenuation artifacts with a 5 point scaling system after sequentially reviewing tomographic images, projection images and gated cine-images. LVEF was measured by gated SPECT.

The fixed defects were proved to be true lesions in 23 cases while 42 cases were due to attenuation artifact, and 18 cases with the undetermined final diagnosis were excluded. There were no significant differences in age, body weight and LVEF between the two groups. Receiver operator characteristics (ROC) curve analysis showed that LVEF measurements did not improve diagnostic accuracy while gated-cine images provided additional accuracy over visual ( $p=0.126$  for observer A;  $p=0.0002$  for observer B) or visual plus projection view assessments ( $p=0.278$  for observer A;  $p=0.019$  in observer B). Moreover, although there was significant inter-observer variance for accuracy with visual assessment alone ( $p=0.005$ ), the gated cine-images provided the highest accuracy and lowest inter-observer variance ( $p=0.821$ ).

ROC curve area	Visual	Projection	Gating	LVEF
Observer A	0.726	0.774	0.846	0.547
Observer B	0.575	0.668	0.839	

In conclusion, gated SPECT improves the accuracy of differentiating attenuation artifacts from true lesions compared to conventional methods. It also enhances the objectivity of assessment by reducing inter-observer variability.