

Summary

Assessment of Left Ventricular Function with the Solid-State Digirad 2020tc Imager™

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Multigated equilibrium radionuclide ventriculography from best septal position (LAO view) was performed in 17 patients with cardiac disease with a single detector Anger-type gamma camera (GCA 602A, Toshiba), then immediately imaged with a solid-state, multi-crystal gamma camera (Digirad 2020tc Imager™). Acquisition times were the same of 10 minutes. The solid-state gamma camera uses CsI(Tl) as the scintillation material and a Si photodiode. CsI(Tl) has a higher density and higher atomic number than NaI(Tl), so that its efficiency for detecting gamma rays is higher. To confirm this, total acquisition counts in 17 patients obtained from the 2020tc Imager™ were significantly higher than those obtained from the Anger-type camera (7847 ± 2061 K vs. 4427 ± 1162 K counts, $p < 0.0001$). In comparing

left ventricular ejection fractions obtained from the Anger-type camera and the 2020tc Imager™ data, an excellent correlation was revealed with a correlation coefficient of 0.97 ($p < 0.0001$). Again, peak ejection rate and peak filling rate obtained from the 2020tc Imager™ data correlated well with those obtained from the Anger-type camera data ($r = 0.93$, $p < 0.0001$ and $r = 0.80$, $p < 0.001$, respectively). These data reveal that the 2020tc Imager™ has an excellent data collection efficiency and a high reliability in assessment of left ventricular function. Thus, the solid-state gamma camera was thought to be a useful hardware in nuclear cardiology.

Key words: Solid-state gamma camera, ^{99m}Tc -HSAD, Multigated equilibrium radionuclide ventriculography.