

Assessment of left ventricular function using solid-state gamma camera equipped with a highly-sensitive collimator

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Purpose: The solid-state gamma camera 2020tc Imager™ (Digirad, CA) is now commercially available and has been clinically applied. The present study evaluates the feasibility of equilibrium radionuclide ventriculography (ERNV) within a 3 min period using this camera equipped with a highly sensitive collimator. **Materials and Methods:** ERNV was performed from the best septal position (left anterior oblique view) in 20 patients with cardiac disease using a single detector anger-type gamma camera equipped with a low-energy, high-resolution collimator. Immediately thereafter, we performed a second ERNV using the solid-state gamma camera equipped with a highly sensitive collimator. Acquisition periods were 10 and 3 min, respectively. **Results:** Significantly more counts were collected from over the left ventricle with the solid-state gamma camera over 3 min than those with the anger-type gamma camera over 10 min (817.1 ± 387.8 k counts vs. 668.2 ± 327.4 k counts, $p < 0.01$). The left ventricular ejection fraction obtained from ERNV data using the solid-state gamma camera correlated closely with those acquired by the anger-type gamma camera ($r = 0.94$, $p < 0.0001$, SEE = 5.93%). **Conclusion:** The results showed that the solid-state gamma camera could assess left ventricular function with excellent data collection efficiency and high reliability.

Key words: left ventricular ejection fraction, solid-state gamma camera, equilibrium radionuclide ventriculography, highly sensitive collimator