

Control/Tracking Number: 08-A-46464-ACC

Activity: ACC.08 Abstracts

Current Date/Time: 9/27/2007 4:49:46 PM

Quarter-time myocardial perfusion SPECT using Wide Beam Reconstruction

Author Block E. Gordon DePuey, Srinivas Bommireddipalli, Marvin Friedman, Ilya Beletsky, St. Luke's-Roosevelt Hospital, New York, NY

Abstract:

Background: Compared to filtered backprojection and iterative reconstruction with OSEM, wide beam reconstruction (WBR), which incorporates resolution recovery and models noise during reconstruction without applying a post-processing filter, has been reported to allow half-time gated myocardial perfusion SPECT acquisition with preserved diagnostic quality. We postulated that with further noise modelling even shorter acquisition times would be possible.

Methods: The half-time WBR algorithm was modified for "quarter-time" acquisitions based upon anthropomorphic cardiac phantom data and a pilot group of 48 patients (pts). Pilot pts underwent 180-degree, 64-stop, full-time single-day rest (25 sec/stop) and stress (20 sec/stop) and then "quarter-time" either rest (6 sec/stop) (n=27 pts) or stress (4 sec/stop) (n=21pts) Tc-99m sestamibi SPECT using a 90°-angled dual-headed scintillation camera with high resolution parallel-hole collimators. Subsequently, using the same protocol, 26 consecutive pts (11 men, 15 women, mean weight= 199.8 lbs., mean chest circumference 41.9 in.) were imaged both at rest and stress prospectively with both full-time OSEM and "quarter-time" WBR using the modified algorithm. Blinded observers graded both perfusion and gated scans for quality (1=poor to 5=excellent) and evaluated perfusion defect characteristics.

Results: For the 26 prospective pts mean image quality for rest full-time OSEM was 3.7 and quarter-time WBR 3.7; for summed stress SPECT 4.1 vs. 4.8; and for gated post-stress SPECT 3.7 vs. 4.2 (p's NS). Perfusion defects present in 5 stress scans and 4 rest scans demonstrated similar extent and severity with full time OSEM vs. "quarter-time" WBR. Mean LVEF was 60.1 + 5.1 with OSEM vs. 52.9 ± 7.0 with WBR (p<.00001).

Conclusions: For perfusion SPECT "quarter-time" WBR affords rest and summed and gated post-stress image quality equivalent to full-time OSEM. As reported previously for half-time WBR, LVEFs are lower for "quarter-time" WBR than for full-time OSEM.

Category (Complete): Nuclear Cardiology/PET

Keyword (Complete): Radionuclide imaging

Institution Information (Complete):

***Responsible Institution 1:** St. Luke's-Roosevelt Hospital

***City:** New York

***State:** New York

***Country:** United States