» Abstract 70081

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Abstract Information

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Title:	**Impact of half-time image acquisition with wide-beam reconstruction on the perfusion scores and diagnostic certainty of single-photon emission computed tomography**
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Abstract Content   89%

Background: Filtered Back Projection (FBP) has been used in SPECT imaging for decades. Half-time acquisition with wide-beam reconstruction (WBR) is a new technology based on resolution recovery, and has not been evaluated clinically.

Objective: To compare perfusion scores and diagnostic certainty of WBR and FBP in consecutive pts. referred for gated SPECT.

Methods: 434 pts. (63+/-13 yrs; 196 F, 238 M) referred for gated SPECT underwent stress Tc-99m sestamibi or tetrofosmin FBP (25 sec/stop) followed by WBR half-time (10 sec/stop) acquisition on a dual-detector 64-stop system (GE Millennium). Images were reconstructed by standard algorithm (QGS, Cedars-Sinai, CA) for FBP and by UltraSPECT (Haifa, Israel) for WBR. Summed stress perfusion scores (SSS) were based on a 5-point/17 segment model (0=normal tracer to 4=absent tracer uptake). Perfusion was considered normal if SSS=0-1, equivocal if SSS=2-3, and abnormal if SSS>/=4. Left ventricular myocardium defect in each of the coronary territory was quantified as %LVLAD, RCA, LCX = SSSLAD, RCA, LCX divided by maximal SSS for all segments in that territory (7 for LAD, max SSSLAD=28; 5 for RCA and LXC, max SSSRCA, LCX=20). Paired t-test and Bland-Altman were used for SSS, %LV, EF. Kappa test was used to compare WBR and FBP for normal, equivocal and abnormal scans and for interobserver agreement. A 2 group t-test was used to compare the magnitude of difference in %LVLAD, RCA, LCX for FBP and WBR discordant and concordant scans.

Results: SSS (4.8±0.4 vs. 4.2±0.4) and EF (59.4±0.7% vs. 57.8±0.6%) and % LV LAD (7±0.7 vs. 5.3±0.7) and RCA (9.4±0.9 vs. 7±0.8) were greater for FBP than for WBR (p<0.0001). Interobserver agreement was good (kappa=0.78), and interscan agreement moderate (kappa 0.49). WBR and FBP agreed fairly for SSS (95% CI of limits: -4.8 to 3.6), EF (95% CI: -10.1 to 7), and % LV LAD (95% CI: -14 to 11) and poorly for %LV RCA (95% CI:-27 to 22.2), LCX (95% CI: -57 to 57). There were fewer equivocal scans with WBR, likely due to a decrease in anterior attenuation artifact (36 vs. 153 for FBP, p<0.0002).

Conclusion: WBR is a promising new approach that reduces equivocal interpretations and allows half-time acquisition. Angiographic correlation is currently in progress.