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A CLINICAL EVALUATION OF TWO RESOLUTION RECOVERY METHODS FOR REDUCED SCAN TIME OF GATED MPI SPECT

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Objective: Resolution Recovery reconstruction methods have been suggested as a means to reduce myocardial perfusion SPECT study imaging time. Clinical validations have suggested that these methods deliver similar diagnostic information and allow for reduced acquisition time.

Methods:

50 patient studies (27 female, 23 male) were reconstructed using filtered back projection (FBP), wide beam reconstruction (WBR™ (UltraSPECT Ltd.)), and OSEM with optimized resolution recovery (OSEM RR). A standard clinical MPI imaging protocol was utilized followed by acquisitions at half time. Full time rest (R) and stress (S) images were reconstructed with FBP, and half time images with both WBR™ and optimized OSEM RR. Studies were interpreted by physicians blinded to the method used and clinical information. 17 segment scores, vascular territories, overall disease, and image quality were recorded on a 5-point scale (0 = uninterpretable, 4 = excellent). Summed stress (SSS), rest (SRS), and difference (SDS) scores were calculated.

Results:

Image quality for FBP, WBR™ and OSEM RR were 2.9 S, 2.6 R; 3.3 S, 2.9 R; and 3.1 S, 2.6 R respectively. Correlations of the methods were: FBP/WBR™ 0.85 (p. 0001), FBP/OSEM RR 0.86 (p. 0001). Diagnostic certainties were FBP = 0.808, WBR™ = 0.767, OSEM RR = 0.788. The total of SSS for FBP 224(mean 4.2), WBR™ 229(mean 4.4) OSEM RR 226(mean 4.3) also correlated well FBP/WBR™ 0.80 (p.<0001), FBP/OSEM RR 0.81 (p.<0001).

Conclusions: Both WBR and OSEM RR demonstrated better or equivalent image quality for half time acquisitions when compared to FBP full time scans. Correlation and SSS indicate all methods deliver similar diagnoses. Therefore, WBR™ or optimized OSEM RR may be substituted for FBP, halving acquisition time yet maintaining SPECT image quality and diagnostic certainty.