



Imaging

INCREMENTAL DIAGNOSTIC BENEFIT OF RESOLUTION RECOVERY SOFTWARE IN PATIENTS WITH EQUIVOCAL MYOCARDIAL PERFUSION SINGLE-PHOTON EMISSION COMPUTED TOMOGRAPHY

Poster Contributions

Poster Sessions, Expo North

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Background: Though myocardial perfusion imaging (MPI) with single photon emission computed tomography (SPECT) is an established diagnostic method, equivocal studies are commonly encountered. New software has been introduced that incorporates resolution recovery (RR) and noise regulation into the reconstruction algorithm and has been used to facilitate “half-dose” and “half-time” studies. Its utility with “full-time, full-dose” acquisition has not been well studied.

Objective: We sought to understand the potential benefit of incorporating RR software in equivocal SPECT studies.

Methods: Patients with full-time, full-dose SPECT MPI were reviewed and those with equivocal results who subsequently underwent cardiac Rb-82 positron emission tomography (PET) scan were identified. Image reconstruction was performed with iterative reconstruction (IR), attenuation correction (IR+AC), and RR software (IR+AC+RR). Images were anonymized and read blindly by consensus of two experienced readers. All images were qualitatively assessed and semi-quantitatively graded using summed stress and summed rest scores.

Results: 45 patients were included (28 males, age =59.6±9.9 years) and the diagnostic accuracy of each of the reconstruction algorithms (IR, IR+AC, IR+AC+RR) was compared to Rb-82 PET. Correlation between the 3 approaches and PET showed incremental improvement. The κ -coefficient between PET and IR, IR+AC and IR+AC+RR were 0.2 (CI:0.0-0.45), 0.3 (CI:0.07-0.56), and 0.66 (CI:0.454-0.875), respectively. The clinical diagnosis of the SPECT studies was significantly improved when IR+AC+RR was compared to IR using PET as a reference standard. IR+AC+RR improved the clinical diagnosis in 14 cases with an overall improvement of reclassification proportion of 23.5%. ROC curves were also created for IR, IR+AC and IR+AC+RR with area-under the curves of 0.65 (CI: 0.50-0.79), 0.69 (CI: 0.56-0.84 p=0.013) and 0.91 (CI: 0.77-0.97, p=0.016), respectively.

Conclusion: The use of RR software may help resolve equivocal SPECT studies and may avoid the need for additional testing. Further prospective studies are needed to further identify the role of this new software.