

Accuracy of cardiac PET imaging using post-injection transmission scan

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The purpose of this study was to investigate the accuracy of cardiac PET with post-injection transmission scans. **Methods:** We performed a phantom study using ^{18}F solution as well as ^{13}N -ammonia PET study of ten patients. The average activities of no myocardial defect phantom model were estimated, and myocardial defect sizes of 12 phantom models were measured by pre- and post-injection transmission methods at various ^{18}F activities. In ^{13}N -ammonia PET at rest and during adenosine triphosphate (ATP) stress studies, measured defect sizes were compared between both methods. **Results:** The ratios of average activity estimated by both methods (post/pre value) were almost 1.00 at each ^{18}F activity and segment. Measured defect sizes by both methods showed an excellent correlation with true defect sizes ($r = 0.98$, $p < 0.01$ for pre vs. true value: $r = 0.98$, $p < 0.01$ for post vs. true value). The mean absolute errors of measurements were minimal up to 3.5% LV, and were similar between both methods. In ^{13}N -ammonia PET, measured defect sizes by both methods also showed a good correlation ($r = 0.97$, $p < 0.01$). **Conclusion:** The results indicate that cardiac PET imaging with post-injection transmission scan provides information on myocardial tracer activity as well as myocardial defect size as does conventional pre-injection transmission method.

Key words: post-injection transmission, PET, cardiac phantom, patients with coronary artery disease, ATP