

Study of a Few Additional Posterior Projection Data to 180° Acquisition for Myocardial SPECT

Authors : Yasuyuki Takahashi, Hirotaka Shimada, Takao Kanzaki

Abstract : A Dual-detector SPECT system is widely by use of myocardial SPECT studies. With 180-degree (180°) acquisition, reconstructed images are distorted in the posterior wall of myocardium due to the lack of sufficient data of posterior projection. We hypothesized that quality of myocardial SPECT images can be improved by the addition of data acquisition of only a few posterior projections to ordinary 180° acquisition. The proposed acquisition method (180° plus acquisition methods) uses the dual-detector SPECT system with a pair of detector arranged in 90° perpendicular. Sampling angle was 5°, and the acquisition range was 180° from 45° right anterior oblique to 45° left posterior oblique. After the acquisition of 180°, the detector moved to additional acquisition position of reverse side once for 2 projections, twice for 4 projections, or 3 times for 6 projections. Since these acquisition methods cannot be done in the present system, actual data acquisition was done by 360° with a sampling angle of 5°, and projection data corresponding to above acquisition position were extracted for reconstruction. We underwent the phantom studies and a clinical study. SPECT images were compared by profile curve analysis and also quantitatively by contrast ratio. The distortion was improved by 180° plus method. Profile curve analysis showed increased of cardiac cavity. Analysis with contrast ratio revealed that SPECT images of the phantoms and the clinical study were improved from 180° acquisition by the present methods. The difference in the contrast was not clearly recognized between 180° plus 2 projections, 180° plus 4 projections, and 180° plus 6 projections. 180° plus 2 projections method may be feasible for myocardial SPECT because distortion of the image and the contrast were improved.

Keywords : 180° plus acquisition method, a few posterior projections, dual-detector SPECT system, myocardial SPECT

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020