47

Effect of Patient Motion on Dual Head Tomographic Myocardial Perfusion

X. Li, S. Chen

Guangzhou Liuhua Qiaol hospital, Guangzhou, China

Purpose: To evaluate the effect of patient motion on dual head tomography and the distinction between the effects on single and dual head tomography. **Methods:** By setting two heads in 90 degrees orientation, a 90 degrees tomography myocardial perfusion imaging was performed on dual head and a 180 degrees was performed on single head (closed another head). During imaging, a myocardial phantom was moved once along the x and y axial direction at 1 pixel, 2 pixels and 3 pixel, respectively. Raw images were analyzed with a motion detection software and reconstructed images were analyzed with polar map. **Results:** (1) Motion detection in dual head imaging, three motions were detected on once motion along y direction and multi-motions were also detected on once motion along x direction but the motion extent was related to the angle 0 between the detector plane and the x direction. (2) Polar map analysis: In y direction, 2 pixels motion on single head and 1 pixel motion on dual map analysis: In y direction, 2 pixels motion on single head and 1 pixel motion on dual head could cause count decrease in apex. In x direction, the effect extent related to one pixel motion at 315 degrees could resulted in count decrease in wall on single head and in apex and wall on dual head. But at 270 degrees motion the effect was slight on single head. **Conclusions:** The effect of patient motion on dual head tomography myocardial perfusion is more striking than on single head

48

Parametric Image of rMBF Using Factor Analysis and Cluster Analysis on $H_2{}^{15}O$ Dynamic Myocardial PET

Jae Sung Lee*, Ji Young Ahn, Dong Soo Lee, Seok-Ki Kim, Kwang Suk Park, June-Key Chung, Myung Chul Lee

Dept. of Nuclear Medicine and Biomedical Engineering, Seoul National University College of Medicine, Seoul, Korea

Composition of parametric image (PI) of rMBF measured by $H_2{}^{15}O$ PET has been the goal of many research efforts. However, this has been difficult to accomplish because of the low SNR of the TAC of each voxel, and the complex kinetic model which includes parameters to correct partial volume and spillover effects. **Purpose:** To develop a method to make a PI of rMBF by combining factor analysis and cluster analysis on $H_2{}^{15}O$ dynamic myocardial PET. **Materials and Methods:** First, right and left ventricular input functions and their factor images were obtained by applying the factor analysis to dynamic frames. By subtracting the factor images from the original dynamic frames, tissue image was obtained in which the vascular components were excluded. Cluster analysis, which averaged voxels with the same shape TACs (NeuroImage, 9:554-61, 1999), was applied to the pure tissue image to reduce calculation time and to improve SNR of the PI. **Results:** Image quality and contrast was significantly improved in comparison to either the factor image of tissue or the subtracted image composed by subtracting the initial 30 sec image from the 2 min one. Computation time was less than 1 min on the workstation 333 MHz with CPU. **Conclusion:** Parametric image developed in this study will serve as an important investigative tool for cardiovascular disease.