51

The Comparison of Ordered Subset Expectation Maximization and Filtered Back Projection Technique for RBC Blood Pool SPECT in Detection of Liver Hemangioma

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Objectives : Odered subset expectation maximization (OSEM) is a new iterative reconstruction technique for tomographic images that can reduce the reconstruction time comparing with conventional iteration method. We adopted this method for RBC blood pool SPECT and tried to validate the usefulness of OSEM in detection of liver hemangioma comparing with filtered back projection (FBP) **Methods** : A 64 projection SPECT study was acquired over 360° by dual-head cameras after the injection of 750MBq of ^{99m}Tc-RBC. OSEM was performed with various condition of subset (1,2,4,8,16 and 32) and iteration number (1,2,4,8 and 16) to obtain the best set for lesion detection. OSEM underwent in 17 lesions of 15 patients with liver hemangioma and compared with FBP images. Two nuclear medicine physicians reviewed these results independently. **Results** : Best set for images was 4 iteration and 16 subset. In general, OSEM revealed more homogeneous images than FBP. Eighty-eight percent (15/17) of OSEM images were superior or equal to FBP for anatomic resolution. According to the blind review of images, 70.5%(12/17) of OSEM was better in contrast(4/17), anatomic detail(4/17) and both(2/17). Two small lesions were detected by OSEM only and another 2 small lesions were failed to depict in both methods. Remaining 3 lesions revealed no difference in image quality. **Conclusion** : OSEM can provide better image quality as well as better results in detection of liver hemangioma than conventional FBP technique.