Comparison Of Filtered Back-Projection and Iterative Image Reconstruction with Bone SPECT

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Abstract

The goal of clinical nuclear medicine imaging is to aid diagnosis, prognosis and treatment planning and monitoring. In order to do so, nuclear medicine image must be of high diagnostic and quantitative accuracy. Single photon emission computed tomography (SPECT) is generally used today to refer to true transaxial tomography with stand nuclear medicine radiotracers. Filter back-projection (FBP) is most commonly used reconstruction algorithm in SPECT, but produces a streak or star artifacts that result from data being laid onto the slice image from various projections. Because of increase in computer power and improvement in reconstruction algorithms, iterative reconstruction has become clinically available as an alternative to FBP, since they can explicitly model the underlying Poisson statistics of photon emissions as well as the physical properties of a SPECT scanner. Iterative reconstruction has improved noise properties over FBP, and give improved image quality with a reduction in streak artifacts. The purpose of this study is to compare image quality of Tc-99m MDP (Methylene-diphosphonate) bone SPECT images reconstructed by FBP and iterative method based on ordered-subsets expectation maximization (OSEM).

Key word: Single photon emission computed tomography, Filter back-projection, Iterative Image Reconstruction.