

Summary

Practical Compensation Method of Downscattered Component Due to High Energy Photon in ^{123}I Imaging

Nobutoku MOTOMURA*, Takashi ICHIHARA*, Takuzo TAKAYAMA*,
Shigeru AOKI**, Hitoshi KUBO*** and Kan TAKEDA***

**Medical Systems Research and Development Center, Toshiba Medical Systems Company*

***Department of Radiology, Suzuka Central Hospital*

****Department of Radiology, Mie University School of Medicine*

We looked into the problem that the quantitative values of ^{123}I data vary according to collimator type. First, we made the assumption that the quantitative values of ^{123}I data are degraded by the scattered photons from the 529 keV component which contaminate the 159 keV imaging data. Then, the ^{123}I Dual Window (IDW) method was proposed to improve the quantitative values of the ^{123}I data. The IDW method uses the energy window on the high-energy side to estimate the amount of scattered 529 keV photons which contaminate the 159 keV data. Since only a dual-

energy window acquisition and a simple image processing are needed, the IDW method can be performed in most conventional gamma camera systems. In the torso phantom studies, the IDW method reduced the error in the semi-quantitative value 'heart/mediastinum (H/M) ratio' in ^{123}I -MIBG myocardial scintigraphy from 22% to 1%. The results of the phantom studies indicate that the IDW method can improve the quantitative values of ^{123}I data.

Key words: Iodine-123, Scatter correction, ^{123}I -MIBG, Collimator, Energy window.