

A. Instrumentation

Evaluation of Performance of Whole Body Scintillation Camera

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The performance and usefulness of whole body scintillation camera was studied. A whole body image with the scintillation camera was obtained by using Picker Omniview whole body imaging system, Picker Dyna Camera and floating top table system with motor drives. The whole body image is formed by adding the positional coordinate information from the scintillation camera to the positional coordinate information of the table movement of Omniview table top.

The intrinsic spatial resolution of the scintillation camera were shown by measuring FWHM of line spread function as 9.0 mm with ^{133}Xe γ -ray, 7.3 mm with $^{99\text{m}}\text{Tc}$ γ -ray, 5.6 mm with ^{203}Hg γ -ray and 5.4 mm with ^{198}Au γ -ray. The scintillation camera has overall spatial resolution of which FWHM of point spread function of 10.5 mm with fixed detector system and one of 11.3 mm with omniview system were shown by studying for 140 KeV γ -ray of $^{99\text{m}}\text{Tc}$ with 10000 holes collimator. Field uniformity and linearity through Omniview system were very superior to these fixed detector system. The influence of dead time on whole body imaging was investigated. The difference of the density of the film is seldom influenced by the bigger quantity of

radioisotope in a local area so that the adjacent area has lesser intensity due to dead time, as the floating table moves back and forth during whole body imaging.

Whole body bone image included information density of 150—200 counts/cm² (at thoracic vertebra). This was taken by setting imaging time by 10 min—15min when 10 mCi of $^{99\text{m}}\text{Tc}$ -diphosphanate was administered to the patient.

We have applied the transmission imaging for anatomical orientation of the whole body image. The whole body transmission image was obtained with γ -rays penetrated through a patient from a 30 cm ϕ disk source of $^{99\text{m}}\text{Tc}$. Radioisotope image with γ -ray emitted from the organ of the patient and transmission image were taken at the same time on identical X-ray film by analyzing two photopeaks with 2 ch. spectrometers so that valuable whole body transmission emission image was obtained. The omniview system also was used to take profile of radioisotope distribution in whole body.

Whole body imaging system with scintillation camera is therefore valuable for diagnosis in nuclear medicine.