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AN OUTLINE OF SCANICAMERA. A.Kasai,T.Miyamae K.Nishimura,M.Seki,K.Ogawa. Mochida Pharmaceutical Co.,Ltd. Saitama Medical College. Tokyo and Moroyama-cho,Saitama Pref.

The stand of SCANICAMERA supports the two detection heads. Each detection head has linear field 60 cm max,and it enables to get whole body anterior and posterior images on one X-ray film in single scanning. SCANICAMERA has both features of a scinticamera and a rectilinear scanner,which are excellent spatial resolution and good detection for high energy. The detection head has 12 P.M.s on a long NaI crystal(2 x 3.2 x 50cm). We measured the spatial resolution and sensitivity of SCANICAMERA,comparing to SEARLE-LFOV on whole body scanning mode. We used Tc-99m,Ga-67 line sources and zigzag lines with it,then changed the thickness of absorbing material between a collimator and sources from 0 to 15 cm. The resolution of SCANICAMERA was better than LFOV when thickness of absorbing material was more than 4 cm. Total counts of SCANICAMERA were half or less than LFOV. Conclusion 1)SCANICAMERA can gets a whole body anterior and posterior view in a short time and in single scanning, it means SCANICAMERA can give the high diagnostic efficiency. 2)SCANICAMERA can be used with high energy RI since the crystal thickness of the SCANICAMERA is thicker than a conventional scinticamera. 3)SCANICAMERA has the excellent spatial resolution. SCANICAMERA is one of the answer to the problem caused by the rapid development of whole body examinations.

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A NEW DESIGN OF HIGH SENSITIVITY COLLIMATOR FOR Xe-133 INHALATION rCBF STUDY WITH A GAMMA CAMERA. H.Ohmori, Y.Kusumi, Y.Nakamura, H.Miki, K.Kimura, Y.Tsuda, H.Etani and Y.Fujino. Department of Radiology, Osaka University Hospital. OSAKA.

A high sensitivity collimator was newly designed for measuring cerebral blood flow (CBF) by Xe-133 inhalation or intravenous method using a gamma camera.

The material used was a low temparature melting alloy,"SEROVEN", which consisted of 50% of bismuth, 26.7% of lead, 13.3% of tin and 10% of cadmium. The Co-60 half-value layer of the alloy was 155mm and the melting point of the material was 70°C.

The collimator was 280mm in diameter, 30mm in thickness and has 274 parallel holes. The hole was 12mm in diameter and the septum thickness between the holes was 3mm.

The spatial resolution was 28mm in FWHM at 300mm distance from the collimator and 38.5mm at 500mm distance. The sensitivity of the collimator was as 6 times in Tc-99m and 15 times in Xe-133 as those of ordinary using low energy collimator.

The rCBF study was done in 5 cases with cerebrovascular disease using this collimator. The shape and the characteristics of the Xe-133 washout curves obtained using both the new and the ordinary collimators were almost equivalent. But the increased count rate and the significantly decreased count variation resulted in much improvement of accuracy and enabled to assess the CBF in small regions.

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EVALUATION OF THE TOMOGRAPHIC IMAGES BY A SENEN-PINHOLE COLLIMATOR. A.Fujita,H.Wani, S.Nakaoka,H.Toyama,K.Chiba,H.Murata and M. Iio. Shimadzu Corporation and Tokyo Metroporitan Geriatric Hospital. Kyoto and Tokyo.

The planar and depth resolution of the tomographic images using a seven-pinhole collimator are degraded in proportional to the distance between the pinhole plane and the image plane, and its square, respectively. The resolution almost depends on the size of the pixels in the camera plane. Two different kinds of collimators for a large view camera and one collimator for a portable camera are designed, and their performance are evaluated by the FWHM. The iterative method is used for the reconstruction of the images. The FWHM in depth direction is measured by using a line source.
And also FWHM is estimated in consideration of the diameter of the pinhole and pixel-size of the image. The measured FWHM agreed with the estimated FWHM very well. This fact shows that the reconstruction by the iterative method is proper.
The cylindrical container in which Tc-99m is filled is used to measure the sensitivity in depth direction. Uniform sensitivity was obtained by correcting the absorption and the solid angle.

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TOMOGRAMS RECONSTRUCTION BY USING CODED APERTURE IMAGING. N.Ohyama,T.Endo,T.Honda, J.Tsujiuchi,T.Matsumoto,T.Iinuma and K.Ishimatsu. Tokyo Institute of Technology,National Institute of Radiological Sciences and HITACHI Medical Corporation. Yokohama,Anagawa and Kashiwa.

Recently, it becomes much desirable in nuclear medicine to establish a tomographic imaging technique getting the distribution of doped γ-ray sources in a human body. The 7-pinhole system uses a multi-pinhole aperture to obtain different images with parallax. But, these recorded images projected through each pinhole should not overlap each other, so that an image cannot be large nor increased the number of pinholes because of the size of the γ-ray camera.

If some overlap between recorded images are permitted, they can be enlarged to improve spatial resolution and the number of pinhole can be also increased to realize higher detecting efficiency. Then, it is expected that the quality of tomograms will be highly improved.

A coded aperture system with 9 pinholes which are arranged like a square grid is designed for myocardinal diagonosis to get tomograms of high quality. Three kinds of coding codes are sequentially used to realize that the overlapped images can be partially separated. By using a modified SIRT algorism good tomograms of phantoms and a human heart are obtained.