

XI. Instrumentation and Radio-pharmaceuticals (II)

Computer Processing of Scanning Image

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One of the aims of data processing of scanning images by computer is to get an image with new informations which were not shown in the original image. We presented two such methods.

1) Application of digital filter—By applying the principle of Fourier transformation, it is possible to synthesize a filter which pass only low frequency wave or only high frequency wave. If low pass filter is applied to the scanning data, it eliminates random noise of the image. If a kind of high pass filter is applied, it may emphasize an edge of an object. We showed the images made by these

techniques and discussed the possibility of clinical application of the method.

2) Construction of an image from regional rate constant—A new image was constructed from a regional rate constant calculated from a set of digital data obtained by Anger camera. This image shows a regional function of an organ, if the function is proportional to the rate constant. Muscle blood flow measured by ^{133}Xe is one of the cases in which the above condition can be applied.

The image of muscle blood flow of a dog obtained by this technique was presented.

Variable Focus Zoom Collimator

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Planning idea; Suppose the focussing collimator consisting of layers of lead discs. If the gaps are made between the discs, the focal distance would change continuously according to the gap-distance.

Structure and specialties: Six 1 ml thick lead discs with 37 holes in its central part are supported by 3 pantagraphs. The gap between the disc changes from zero to 0.5 cm and the focal distance from 8 cm to 11.5 cm. The crystal side hole area has 7.5 cm diameter and

objective side 4 cm. The discs are moved up and down by the external ring. The same gap-distance between the six discs is obtained by the pantagraphs.

Half value width as obtained with a I-131 line source was 1.2 cm at all the focal distance.

This collimator saves interchanging. Sharpness and sensitivity are not the special problem. No significant increase of background by opening the gaps was observed.