data were transferred to the magnetic tape recorder (MT) after one way scanning. The MT was fed into a computer for processing. First, the correction of read data was performed for scalloping, arrangement of data array and half life of nuclides etc. Next, in order to reduce the random fluctuation the raw data was smoothed. Then, to extract the true information from the smoothed data, which were blurred because of the lack of resolution of the detecting system, iterative approximation was performed by the resolving power matrix of the collimator. Finally, the heighest count was determined in the matrix and was divided into 20 levels, each of which was given a typed symbol to be printed in the matrix.

From the experiments for smoothing method, it was found that averaging by 15×9 elements with collimator response was appropriate in the clinical studies for our present system. The computer scintigrams from a scintiscanner with 61 hole collimator were more excellent in their resolution than those from a scinticamera. It seemed that the resolution of processed RI image depended greatly on the detecting system. It may be considered that the digital computer processing has the clinical usefulness with the significant improvement in the details of scan display.

Two Dimensional Analogue Processing of Radioisotope Images

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An analogue method of two dimentional processing for radioisotope image is proposed. In this method, an original image is scanned quickly in varying direction with uniform scan line density, and the video signal obtained with the above scanning is processed by a suitable electric filter and displayed on a CRT or storeged on an image storage tube to form an image. The obtained image is the superposition of one dimensionally processed images in varying direction, and the process is equivalent to a two dimensional processing. Thus, one can realize two dimensional image processing with a simple electric filter.

The equivalent point response function of the process is polar symmetry, and its axial spatial response f(r) and the axial frequency response F(ν) are given by

$$f(r)=g(r)/r$$

$$F(\nu)=2\pi\int_0^\infty g(r)J_0(2\pi\nu r)dr$$

respectively, where g(t) is the impulse response of the electric filter, r the axial distance of the space response, ν the axial frequency, and J_0 the first kind, zero order Bessel function.

The advantages of the analogue method proposed here are: (1) capability of handling large information quantity in a short time, (2) continuous, high quality images obtainable, (3) no error associated with quantumization, and (4) easy setting of parameters for optimum processing.