Automatic Data Processing of RI Dynamic Study (Processing of Renal Function Data)

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The RI dynamic study of the renal function with scintillation camera has been extensively performed, because it is superior, in that not only the function but also the morphological information of the kidneys are obtained. The analysis of renal function requires much trouble and time, because the region of interest (ROI) has to be set up from the information obtained, and functional curves on ROI have to be prepared. Therefore, in this study the author tried to classify the functional curve pattern on ROI by processing with a computer.

Method: 300–500 μCi of ^{131}I-Hippuran was injected intravenously and the scintiphotographic images were accumulated by scintillation camera and CDS-4096 every 10 seconds for 16 minutes while the information was simultaneously being recorded on magnetic tape. The magnetic tape was processed using an IBM370–135 computer. The ROI was determined by the following process: At first, the images were accumulated from 2 to 8 minutes, and after the process of smoothing the peak count was obtained. The author decided both kidney regions by determining the outline formed by the points which were more than 30% of the count. The curves of the selected areas were drawn, from which parameters such as peak time, peak count, and the time to 1/2 peak count were calculated. The pattern was classified into sic (N, M1, M2, Mm, ML, and L), mainly according to the pattern classification of Minami.

Result: As a result of clinical data analysis by this method, the ROI could be obtained automatically. The pattern was classified into six by parameters obtained from the functional curves on ROI.

Myeloscintigraphy Introduced into The Computer System

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Although myelography has been recognized as the most useful tools in diagnosing spinal diseases, it is also known to have unavoidable side-action and to cause hardship on the patients. On the contrary, myeloscintigraphy using isotope has none of these shortcomings. However, because

myelogram obtained by myeloscintigram is not as clear as one using the solution, the method has not been used widely. This report is based on the success on leveling up the resolution rate of myeloscintigram to the point where data could be put into the computa system.

METHOD:

(1) Clinical Examination; 99mTc-DTPA 5mCi are administrated through lumbar puncture. After 1–2 hours, scintigraphic data are collected. (scintilation camera; SHIMAZU 4 1/2 PHO/GAMMA III, colimeter; 140 Kev. 20,000 holes, computa; SHIMAZU minipack 200)

(2) Clinical Examination; To make sure the correctness of scintilation camera, we made a basic phantom examination. Examination has three subjects; 1) resolution volume for cubic substances in phantom space, 2) resolution rate for narrowing rate, and 3) influence for curve rate.

RESULTS:

(1) Clinical Examination; Obtained narrowing rate compared with operative observation and oil-myelogram was demonstrated to be similar.

(2) Basic Examination; 1) Resolution volume for cubic substances was 6 mm^3 under condition of distance being 5 cm between the pahntom surface and the colimeter.

2) Resolution rate for narrowing rate; Narrowing rate obtained by the computa system and true measured narrowing rate are similar to each other under condition of distance being lessthan 75%.

3) Influence for curve rate; Normal spinal curve rate has no influence to the myeloscintigram.

CONCLUSION:

Myeloscintigraphy introduced into the computa system may provide the possibility to get a quantitative diagnosis, such as narrowing rate caused of spinal canal stenosis.