10

ON A METHOD FOR RECORDING AND MONITORING DATA FOR DYNAMIC IMAGE BY USING CASSETTE VTR IN NUCLEAR MEDICINE. K.Ohmura, M.Kiri, H.Murata, S. Kawaguchi, K.Chiba and M.Iio. Systems Department, Shimadzu Corp. and Tokyo Metropolitan Geriatric Hospital. Kyoto and Tokyo.

From the view point that dynamic image processing plays an important role in nuclear medicine diagnosis, we developed a colored CRT display using core memories of mini-computer. One of the most common ways of preserving data for dynamic image processed by computer is to file the digital data on Magnetic Disk or Tape. Although this procedure has an advantage of giving an accurate picture, it has following disadvantages:
(1) high cost
(2) necessity of computer when filed data is displayed
In this paper, our new technique for recording and monitoring data for dynamic image by using cassette VTR is reported.
In general, it is necessary for VTR input signal to be consistent with NTSC system in order to record and monitor, using cassette VTR, image data which is displayed on colored CRT. However the colored CRT in nuclear medicine usually adopts RGB system and has high resolution; and differs in the form of signal from the regular CRT for broadcasting. Thus it is impossible to record and monitor the image data by directly applying the signal from the CRT for RGB system to VTR. One of the possible ways to record the data to VTR is to take picture on CRT directly with TV camera. However disadvantage of this method are as follow:
(1) degradation of picture quality
(2) asynchronization between CRT and TV camera
Considering all the problems above and utilizing Color Encoder, we have developed a new technique for recording and monitoring data for dynamic image.

11

REAL TIME DATA PROCESSING SYSTEM FOR THE CARDIOVASCULAR NUCLEAR MEDICINE. M.Hosoba*, S. Takahashi*, R.Ban*, H.Toyama**, H.Murata** and M.Iio**. Shimadzu Corporation* and Tokyo Metropolitan Geriatric Hospital**. Kyoto* and Tokyo**.

We have developed new data acquisition methods for the first pass (FP) and equilibrium (EQ) study in ECG gated radionuclide angiography. The system includes camera interface, NOVA3 minicomputer with 128 KW main memory, 24 MW disk, magnetic tape, graphic CRT and color CRT. The large main memory and the high speed disk made possible the real time image mode data acquisition. Representative methods of the system are as follows: A) FP study: Image mode data acquisition of 40 msec per frame with ECG R-wave timing signal. B) EQ study: (1) 64 x 64 matrix size multiple gated acquisition (MGA) (31 frames per cardiac cycle), (2) 32 x 32 matrix size (center area in 64 x 64 matrix size) high temporal resolution MGA (124 frames), (3) 32 x32 selected cardiac cycle MGA (40 frames). By this method, irregular cardiac cycle data could be completely rejected.

12

VARIABLE TIME INTERVAL IMAGE FILING METHOD AND ANALYSIS FOR RADIOISOTOPE DYNAMIC STUDY

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High speed image filing has been recently required for accurate dynamic study with heart and other organs by the computer, therefor, large magnetic disk memory must be attached to the computer with these studies, but large disk memory are not enough to file with short interval and long hours image filing. Variable filing interval method has been tried by authors for economic load to the computer. Method is as follows;
(1) Fast image filing interval at first step is practiced to angiographic phase with 20 to 500 msec.
(2) Second image filing interval is medium speed with 500 msec to 10 sec, for the transportation from vascular phase to parenthyma of the organ.
(3) Final image filing interval is low speed with 10 to 50 sec for secretory phase of the organ.
Disk memory is effectively used by this method, and necessary disk memory and processing time is reduced under 1/10 compared with fixed interval time method without data loss.
Image analysis has been practiced by gamma and exponential function, and functional images.

13

INVESTIGATION OF CHARACTERISTICS OF MOTION CORRECTION SYSTEM ATTACHED TO γ-CAMERA. K. Tabushi,S.Ito,Y.Watanabe,Y.Takahashi,T.Nakajima,F.Kado,M.Sakura,Y.Sasaki and T.Nagai. Saitama Cancer Center,St.Marianna Univ. School of Medicine and Gunma Univ. School of Medicine. Ina,Kawasaki and Maebashi.

In order to get better spacial resolution in scintigrams a motion correction system which correct patients movement during examination was attached to a LFOV γ-camera. The effectiveness of motion correction and time constants of the system were studied. Correction was performed by coinciding the newest center of radioactivity with the initial center. The center of radioactivity was determind with analog circuit. A point source which was attached to the disk of a centrifugal machine was rotated. The relationship of effect of correction with speed of rotation and also with intensity of radioactivity was obtained and analyzed. Radius of circle image was 6.9 cm when Motion Correction was not used. If speed of rotation was slow, the image in scintigram became nearly a point. The radius of circle image increases gradualy by increase of speed of rotation and it reaches 6.9 cm finally. A point source was put on a shaker. Relationship between effect of correction and intensity of radioactivity was analyzed also. The shaker moved by 3.5 cm distance back and forth twice per second. Scintigram image of shaked point source of 1.4 mCi formed a line of 3.5 cm in length and point source of 8.4 mCi formed a line of 0.5 cm in length. The time constant which was calculated theoretically on the basis of experimental data was 0.3-0.7 seconds for 1.4 mCi source and 0.1-0.2 seconds for 3.7 mCi source.

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