496

DEVELOPMENT OF NMR IMAGIMG SYSTEM.

K. Matsumoto, I.Imazato, M.Horiuchi, J.Hatta and T.Yazaki. Sanyo Research Center, Hirakata.

Whole-body NMR imaging system was developed and is being in clinical trials. The main magnetic field is produced by a 4-coil resistive magnet which is operated at a field strength of 0.14T giving a proton resonant frequency of about 6MHz. The combination of selective excitation and projection reconstruction imaging technique is used so that slice thickness is 10-15mm and scanning time is 2-10 minutes. Images are reconstructed both on 128 × 128 and 256 × 256 pixel matrix. The caluculation time is about 5 seconds using an array processor for a 128 × 128 matrix. Pictures are displayed on a 512 × 512 matrix and 256 gray steps.

It proved that the determination of slicing position by scout viewing on a sagittal image is an effective medical imaging technique. Since a spin echo refocused by 180° RF pulse is used for sampling data, various (T_1, T_2) enhanced proton density images are obtained. The distributions of relaxation time T_1 and T_2 are obtained by calculation between several images which are imaged on different parameters of pulse sequence. In this lecture we will explain the outline of device and imaging technique and show some head images.

497

NMR-CT(MODEL MRT-15A).

H.Takase(Toshiba Co.), H.Suzuki(Toshiba Co. Nasu Works) M.Sato(Toshiba Medical Systems Co.)

This apparatus can display as an image the distribution of spin density or relaxation time (T_1 or T_2) of hydrogen nuclei existing in a human body utilizing nuclear magnetic resonance (NMR) phenomenon. Slicing position is selected by electrically setting a plane of an equivalent magnetic field strength in a object to be examined without any mechanical movements. Coronal, sagittal and oblique as well as axial images can be directly taken. Bones are not displayed in NMR images due to the fact that they have few hydrogen nuclei. Making use of this characteristics, the spinal cord can be visualized without any contrast agents.

Clinical examination test using MRT-15A has been performed at Toshiba Central Hospital with the help of Univ. of Tokyo School of Medicine since June 1982. As of April, 1983, 160 patients were examined. This machine has various automatic adjustments for anyone to operate it easily. The resistive magnet designed and manufactured by Toshiba has been adopted to minimuze its size and operating cost.

498

SPIN-WARP IMAGING METHOD IN NMR-CT.

T.Maki, H.Toyoshima (Asahi Chemical Industry's Systems Engineering Laboratory), M.Ohshima (Asahi Medical)

Asahi Chemical has since 1980 worked in collaboration with the University of Averdeen, the U.K. in relation to the development of NMR-CT which employs spin-warp imaging utilizing the vertical magnetic field of a resistive magnet. This has led to the successful development of a highly stable and easy-to-operate NMR-CT system for diagnostic examination. In this presentation, we describe the spin-warp imaging method, the developments which have been achieved, and the subjects of continuing studies.

499

SOME FEATURES ON TESLACON; AN NMR-CT OF TECHNICARE CORPORATION.

K.Tachikawa. Aloka Co.,Ltd., Mitaka, Tokyo

Teslacon system has both types of magnet, conductive and superconductive. Common features of NMR-CT compared to X-RAY CT are;

(1) Non-Invastive Technique
(2) Imaging of biochemical information
(3) Slice Image in any direction

Besides the above features, Techicare adds the following ones to their product.

(4) Three-dimensional data collection
(5) Multi-slice data collection
(6) ECG gated data collection
(7) Suitable RF coils in several apertures and forms