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NMR-CT IMAGING OF THE ANIMAL(REPORT 1)

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This study of animal was examin to obtein NMR image for an nomal rabbit. The male rabbit was imaging using of low grade static field (0.1 tesla, 4.5 MHz) NMR-CT scanner, which is developed by Asahi chemical co.,ltd.

The imaging methods were inversion-recoverry and caluculated Tl (Td 300, Tr 1000 msec and Td 350 , Tr 1000 msec).

The rabbit was marking on xiphoid process and then was scannig in the head coil for houman's. The each slice was 5mm or 10mm thick. This examination demostrated high odject contrast , especialy heart kidney muscle and fat have fine contrast.

The result , this animal NMR-CT imaging sutudy indicate usefuly as a nomal NMR-CT imaging model.

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SEPARATION OF LIPID PROTON BY T_1-SPECTROSCOPY.

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Non-inavasive evaluation of in vivo tissue lipid content may be relevant from the point of view of the aging study, fatty bone marrow associated with the radiation therapy etc.

For this purpose, the chemical shift separation of the lipid proton from water proton may be usefull. The way of lipid-water pront separation would be the 2-exponential curve fitting of the saturation recovery kinetics data of the in vivo tissue. This T_1-spectroscopy was applied to separated salad dressing, soft margarine as well as to the fatty bone marrow, spine and spinal metastatic tumor.Our preliminary results were encouraging to some extent.

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THE CLINICAL EVALUATION OF NMR-CT (REPORT 3)

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In this study, a low static magnetic field (0.1 Tesla) NMR-CT scanner is used. The main pourpose of this clinical study is to determine the clinical efficacy of the extent to which the spatial and contrast resolusion of this type scanners can be improved.

Our main imaging methods are the inversion-recovery or IR, saturation-recovery, or SR, and calculated T_1. Difference, or D image, constructed by subtracting the data of the IR signal from that of the SR signal, have also been obtained in some cases.

Hybrid images were constructed from two or more images to obtain clear definition of areas of interest. By using the hybrid image, several tissues of different relaxation times can be shown in the same image.

Application in our study of the newly developed hybrid image indicates its importance in the detection and diagnosis of lesion, especially the detection of the differentiation of an edematons lesion from a tumor, the grade of an edema and also abnormal fluid collection such as the pleural effusion or ascites.

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THE CLINICAL EVALUATION OF NMR-CT (REPORT 4)

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In our institute the main method of the clinical evaluation of NMR-CT has been the comparison of the diagnostic ability of NMR-CT and X ray-CT.

Then the NMR-CT is developing rapidly in these years. So the acculacy of lesion detectability will be able to become better. This time we checked the clinical evaluation of NMR-CT compared with X ray-CT for lesion detectability.

In our NMR imaging macine also some improvements were done, and the spetial resolution is become better with the effort for the S/N ratio or software improvement. But the hardware of the NMR macine is not changed yet.

Conclusively the ditectability of the lesion becomes better stepwise.