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NMR-CT IMAGING OF THE ANIMAL (REPORT 1)
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This study of animal was examined to obtain NMR image for a normal 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 recovery and calculated $T_1$ (Td 300, Tr 1000 msec) and $T_2$ 350, Tr 1000 msec). The rabbit was marking on xiphoid process and then was scanning in the head coil for human's. The each slice was 5mm or 10mm thick. This examination demonstrated high object contrast, especially heart, kidney muscle and fat have fine contrast.

The result, this animal NMR-CT imaging study indicated usefully as a normal NMR-CT imaging model.

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SEPARATION OF LIPID PROTON BY $T_1$-SPECTROSCOPY.

Non-invasive 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 useful. The way of lipid-water proton 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)

In this study, a low static magnetic field (0.1 Tesla) NMR-CT scanner is used. The main purpose of this clinical study is to determine the clinical efficacy of the extent to which the spatial and contrast resolution 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 edematous lesion from a tumor, the grade of 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)

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 accuracy 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 machine also some improvements were done, and the spatial resolution is become better with the effort for the S/N ratio or software improvement. But the hardware of the NMR machine is not changed yet. Conclusively the detectability of the lesion becomes better stepwise.