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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 imaged using a 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 T₁ (T_d 300, T_r 1000
msec and T_d 350, T_r 1000 msec).

The rabbit was marked on xiphoid process
and then was scanned 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 indicates usefully as a normal NMR-CT
imaging model.

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SEPARATION OF LIPID PROTON BY T₁-SPECTROSCOPY.
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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 T₁-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 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 T₁.
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 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 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 becoming 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.