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MAGNETIC RESONANCE IMAGING OF THE LUNG TUMORS: DIFFERENCE OF THE IMAGES WITH THE VARIABLE PULSE SEQUENCES AND IN VIVO T1 AND T2 CALCULATIONS.

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To evaluate the tissue contrasts of tumor /fat and tumor/muscle, magnetic resonance imaging(MRI) of 20 patients with lung cancers were performed with the sequences of Short SE(TE 40 msec, TR 400 msec), Long SE(TE 80-120, TR 1500-2000) and IR(TE 40, TI 400-500, TR 1500-2000). And T1 and T2 calculations were performed in 11 of those cases. T1 images were calculated from IR images and SE images, and T2 images from short TR-SE images and long TR-SE images by the two-point method. As a result, Short SE images provided good tissue contrasts in separating tumors from fat and Long SE images provided good in separating tumors from muscle. The tumors in seven cases had very low signal intensities on IR images and could not be detected. The computed T1/T2 of skeletal muscles, subcutaneous fatty tissues, and tumors were 320 ± 55 (msec)/- 44 ± 8 , $239 \pm 30/70 \pm 7.5$, and $530 \pm 156/79 \pm 18$ respectively. And T1/T2 of the tumors had the correlation of (T1)=7.9 (T2)=97, $r=0.90$, $p < 0.01$. In conclusion, tumors, fat and muscle were clearly separated by their T1 and T2, and the correlation of the tumors' T1 and T2 suggestively showed their character or the status of their degeneration.

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THE PRESENT CONDITION OF CARDIAC MRI AT THIS HOSPITAL - THE COMPARATIVE STUDY BETWEEN GATED AND NON-GATED METHOD - BY THE NMR AT 0.5 TESLA. Y. Mashima, Y. Mori, T. Yamada, J. Harada, K. Kawakami, S. Tada. The department of radiology of Jikei University of medicine, Tokyo. A. Asahara. JNR central Hospital, Tokyo.

The images of 172 patients were obtained from August, 1983 to April, 1985 by the MRI system at 0.15 Tesla on the hospital. On these period, cardiac study of 40 patients were performed by NMR. Moreover, gated MRI of 22 patients were obtained (OMI- 13 patients, HCM- 9 patients). On this time, the analysis of ROC for the ability of detecting the focus of OMI and grasping the thickness of myocardium were performed on the images of gated MRI, non-gated MRI and T1-201 SPECT images. On the analysis of ROC for the ability of detecting the focus of OMI, the high accuracy was obtained by the images of gated MRI and T1-201 SPECT images, and the high accuracy of grasping the thickness were also obtained by the images of gated MRI.

On these results, gated MRI is necessary study for the cardiac MRI by 0.15 Tesla NMR.

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THE TRIAL FOR ESTIMATION OF CARDIAC FUNCTION EMPLOYING MRI.

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MRI provides non-invasively the clear images of the wall of the left ventricle (L.V.) without any contrast agents.

With MRI employing the cardiac gating system, we estimated the volume and the ejection fraction (E.F.) of the L.V. of volunteers based on the section of the long-axial L.V. using an oblique imaging technique.

We obtain the long-axial image of the L.V. at end diastolic and end systolic phase in ECG respectively, then measure the length and the area in the long-axial image of the L.V.

The E.F. is calculated from the EDV and the ESV by using the ellipsoid-single plane method.

Finally, we compare the E.F. from MRI to that from UCG.

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MAGNETIC RESONANCE IMAGING OF THE TRANSPLANTED KIDNEY. S. Nawano, National Sakura Hospital. Chiba. N. Arimizu, T. Ochiai, Chiba University School of Medicine, Chiba. H. Ikehira, N. Hukuda, Y. Tateno. N. I. R. S. Chiba.

Magnetic resonance imaging was performed on patient with transplantation of kidney. Imaging was done using a 0.1 Tesla resistive MR imaging unit using inversion recovery(IR):TR, 1000 msec; inversion time (TI), 400 msec and T1 image. Fifteen patients were studied; good function seven, acute rejection two, chronic rejection six. The corticomedullary differentiation (CMD) was seen on good function (6/7), not seen on rejection (6/9). The T1 value of the cortex and medulla on good function transplanted kidney were 400-430 msec and 480-540 msec. The T1 value on acute and chronic rejection was wide spreaded; 430-620 msec. The CMD on IR image is the good sign for rejection reaction. The T1 value of the transplanted kidney was not good for rejection reaction.