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APPROACH TO AN PRECISE METHOD OF T1-IMAGING
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Briefly speaking there are two categories of the method of computation of spin-lattice relaxation time $T_1$ by NMR imager. The first one is the parameter optimization of the time series data obtained from saturation recovery (SR), or inversion recovery (IR) mode. These so called multi-point methods are too consumptive of time for clinical practice.

The second category is the "two point" method by using the ratio of IR signal to SR signal. Generally speaking, the computed $T_1$ by the "two point method" will be lower than the actual $T_1$ when the pulse repetition time is not long enough compare to $T_1$. In order to overcome this difficulty, we have established a method for a precise method of $T_1$ imaging, in which the repetition time $T_r$ is $3T_0$(delay time). Sophisticated correction of the effect of Gaussian shape of slice profile was also performed.

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IMAGING OF NORMAL ANATOMICAL STRUCTURES

We performed the MR-CT imaging of 21-year-old normal male volunteer and examined the parameters($T_R, T_E$) to obtain good contrast between two adjacent anatonical structures. We used 0.35T superconductive MR-CT, and spin echo sequence with various imaging parameters ($T_R=400, 600, 1600; T_E=35, 70$ msec) was performed. Signal intensities of various organs or tissues were plotted against $T_R$ or $T_E$, and parameters that produce maximal contrast were determined.

The results are as follows---:
1. Long $T_R$(1600msec--) is preferred to discriminate gray matter and white matter of brain.
2. CSF can be distinguished from CNS tissues when $T_R$ is relatively short (about 400msec).
3. Thyroid gland is readily distinguished from muscles with various $T_R$ and $T_E$.
4. Discrimination between soft tissue organs(liver, spleen, kidney) and fat is good when $T_R$ is 400-600msec.
5. The contrast between bladder wall and urine is relatively good when $T_R/T_E$ is 400/35 or 1600/70. 400/35 also makes good contrast between prostate and urine.

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NMR imaging of the human head and high magnetic field strength of 1.5 tesla and greater requires some special considerations compared to similar studies at lower fields. First, the normal transmitter and receiver coils used up to 0.5T are not functional at 1.5T (64 MHz proton resonance frequency) requiring the design of special antenna systems. Second, the improves signal-to-noise ratio - particularly for imaging of the head - allows improved resolution through the definition of thinner slices (signal-to-noise is linearly proportional to slice thickness) or higher in-plane resolution by decreasing pixel area (decreasing field of view). The principal effect of longer $T_1$ is the need to increase the repetition time ($T_R$) of spin-echo $T_2$ weighted scan sequences to prevent destroying $T_2$ contrast through partial saturation. Also longer $T_1$ means that $T_1$ weighted images produced by inversion recovery (IR) pulse technique have an inordinately long acquisition time. The partial saturation pulse sequence therefore becomes the method of choice for producing $T_1$ weighted images, but this however is less appropriate to multi-slice than IR and may lead to a reduction in imaging efficiency.