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APPROACH TO AN PRECISE METHOD OF T_1-IMAGING

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Briefyly 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 multipoint 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 sigal. 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 ordet to overcome this difficulty, we have established a method for a precise method of T_1-imaging, in which the repetition time Tr is 3Td(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 WITH 0.35T SUPERCONDUCTIVE MR-CT. Y.Okada, M.Minami,N.Kosaka,M.Ito,K.Yoshikawa, J.Nishikawa,K.Machida and M.Iio. University of Tokyo,Tokyo.

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

(1) Long TR(1600msec--) is preferred to discriminate gray matter and white matter of brain.
(2) CSF can be distinguished from CNS tissues when TR is relatively short (about 400msec).
(3) Thyroid gland is readily distinguished from muscles with various TR and TE.
(4) Discrimination between soft tissue organs(liver,spleen,kidney)and fat is good when TR is 400-800msec.
(5) The contrast between bladder wall and urine is relatively good when TR/TE is 400/35 or 1600/70. 400/35 also makes good contrast between prostate and urine.

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PRACTICAL CONSIDERATION OF HUMAN NMR IMAGING AT HIGH MAGNETIC FIELDS. **Shin Ohashi, Toray Fuji Picker International, Inc. Original paper by G.N. Holland, J.M. McNally, and G. Hurst.**

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 TI is the need to increase the repetition time (RT) of spin-echo T2 weighted scan sequences to prevent destroying T2 contrast through partial saturation. Also longer T1 means that T1 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 T1 weighted images, but this however is less appropriate to multislice than IR and may lead to a reduction in imaging efficiency.