

Second European Congress of NMR in Medicine and Biology, Berlin

June 23-25, 1988

SCIENTIFIC PAPER APPLICATION

Deadline: March 15, 1988

Oral-Presentation: ☒ Poster: ☐ If not accepted for oral presentation are you willing to present a poster? ☒ Clinical: ☒ Physical: ☐

Mail to: General Secretary Claus D. Claussen, M.D.

Second European Congress of NMR in Medicine and Biology,
Radiologische Klinik, Klinikum Rudolf Virchow, Charlottenburg,
Freie Universität Berlin, West Germany
Spandauer Damm 130, D-1000 Berlin 19

Summarize in 400 words or less, single-space
Do not submit separate graphs or charts.
No tone photographs are allowed.
The abstracts should be camera ready.

Technical Equipment: Slide Projector: ☒ Film Projector 16 mm: ☐ Video Tape VHS: ☒ Overhead: ☐

Abstract

3D-IMAGING OF NEUROLOGIC DISORDERS USING GRADIENT-ECHO SEQUENCES WITH SHORT TE

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Localisation of intracranial pathology often requires additional or oblique slice orientations. The physician mentally correlates the information of 2D-images to the complex structure of the central nervous system and to the results of other imaging modalities.

Threedimensional anatomic information is provided by a set of thin contiguous slices ,when reformatted in arbitrary planes or projections of surfaces are reconstructed.

Such an isotropic aquisition is possible within tolerable examination times, using gradient echo sequences. Major drawback was signal void in anatomic important regions, like the base of the skull ,caused by susceptibility changes.

To solve this problem ,very short echo times (5 or 6 milliseconds),were incorporated into a FLASH sequence. TR was 40 ms, resulting in an aquisition time of 10 minutes for 64 1.4 to 1.8 mm thick slices. 45 Patients with various neurologic disorders had a 3D examination in addition to the conventional brain study.

The 3D FLASH images were free of signal void ,due to susceptibility changes at the interface of bone ,air to soft tissue. The S/N ratio and the T1 contrast was similar, or in most cases better, compared to conventional T1 weighted spin echo images. Partial volume averaging effects are minimized using a slice thickness of less than 2mm. Marked improvement in detection of small lesions is inherent to the 3D method. The main advantage of 3D FLASH is , however ,that the entire brain can be scanned with contiguous ,thin slices , capable of multiplanar reconstructions. Orthogonal and curved reformatted images enable better location of pathology near critical anatomic structures. Reconstructions of surfaces within the obtained data-set further improved threedimensional orientation ,important for surgical planning. The sequence as used in this program is also sensitive to paramagnetic contrast agents , like Gd-DTPA.

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3-D-Imaging of neurologic disorders using gradient-echo with short TE

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