

MR-IMAGING OF INNER CEREBRAL TRAUMA

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Neuropathological examinations in closed head injury of the accelerated type shows a certain pattern of deep brain lesions, which were first defined by Grcevic under the term "inner cerebral trauma" (ICT).

The typical ICT pattern is characterized by lesions within the corpus callosum, periventricular deep white matter, basal ganglia, hippocampal structures and the midbrain.

The extension of ICT are often underestimated by computed tomography (CT) due to relative insensitivity towards small and non hemorrhagic lesions.

In order to evaluate the potential of magnetic resonance imaging (MRI) in the assessment of ICT 60 patients were investigated between December 1989 and December 1990.

All MR-studies were performed on a 1.5 Tesla Magnetom using a circular polarized head coil (field of view = 25 cm). The imaging protocol consisted of T1 (500/15/TR/TE) and PD/T2 (2400/15/90) weighted images (WI). Additionally a 3D-FLASH-sequence (40(5/~~90~~) = 40°) was performed in 45 patients. All patients had been monitored by continuous pulse oximetry, capnography, ECG and blood pressure manometry. 35 patients underwent general anesthesia. In 13 patients MR-examinations were done within 7 days after the accident.

In all patients MRI proved to be more sensitive in detection of parenchymal lesion than CT. Additional to axial PD, T2 WI, sagittal T1 WI allowed a better delineation of lesions within the corpus callosum.

Coronal PD, T2 WI turned out to be of major importance for the visualization of injuries within the hippocampal/parahippocampal complex.

In 10 patients MR-follow-up-examinations were done, which allowed a clear differentiation between primary and secondary injuries. Additionally the pattern of lesions was evaluated with special respect to direction of traumatising forces.

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