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Gadolinium-DTPA in MR Imaging of Glioblastomas and Intracranial Metastases

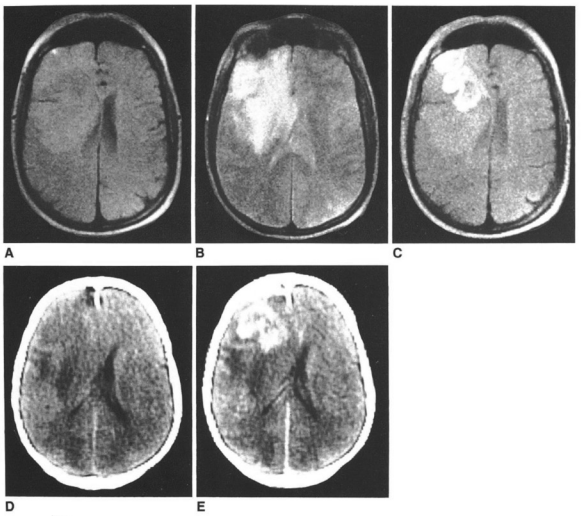
Claus Claussen[1]
Michael Laniado[1]
Wolfgang Schörner[1]
Hans-Peter Niendorf[2]
Hanns-Joachim Weinmann[3]
Wiland Fiegler[1]
Roland Felix[1]

In 14 patients with the diagnosis of glioblastoma ($n = 7$) or intracranial metastases ($n = 7$), magnetic resonance (MR) imaging was performed using a variety of spin-echo (SE) pulse sequences before and after intravenous injection of 0.1 mmol gadolinium-DTPA (Gd-DTPA) per kilogram of body weight. In 10 patients, tumor tissue could not be adequately differentiated from perifocal edema on unenhanced scans with any of the applied pulse sequences. In four cases of intracranial metastases, poor differentiation between tumor and perifocal edema was possible in T2-weighted (SE 1600/70 and SE 1600/105) unenhanced scans. After administration of Gd-DTPA, tumor tissue showed marked contrast enhancement, and tumor delineation was consistently possible on SE 800/35 images. Tumor tissue could be differentiated from perifocal edema on SE 800/70 scans. Gd-DTPA is likely to increase the potential of MR imaging and refine the evaluation of glioblastomas and intracerebral metastases.

The advent of magnetic resonance (MR) imaging has broadened the spectrum of diagnostic methods in radiology. Clinical experience with MR imaging of the brain is accumulating rapidly. It has already been shown that the diagnostic potential of MR for lesions of the central nervous system is comparable to that of computed tomography (CT) [1–5]. In some cases, MR even seems to be diagnostically superior to CT (e.g., in posterior fossa tumors and brainstem tumors) [6–9].

The use of iodinated contrast agents makes contrast-enhanced CT scans superior to unenhanced MR images, particularly in demonstrating the margin between tumor and perifocal edema. Therefore, the development of specific contrast media for MR imaging was proposed [1–4, 7] and has become an attractive field of research.

Paramagnetic substances may be regarded as potent MR contrast agents if they enhance image contrast between magnetically similar but histologically dissimilar



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[1] Department of Radiology,
burg, Free Universität Berlin
130, D-1000 Berlin 19, West
reprint requests to C. Clausse

[2] Schering AG, Berlin, West

[3] Berlex Laboratories, Inc.
07927.

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MR Imaging of the Aging Brain: Patchy White-Matter Lesions and Dementia

Michael Brant-Zawadzki[1]
George Fein[2,3]
Craig Van Dyke[2,3]
Ralph Kiernan[2]
Linda Davenport[2]
Jack de Groot[4]

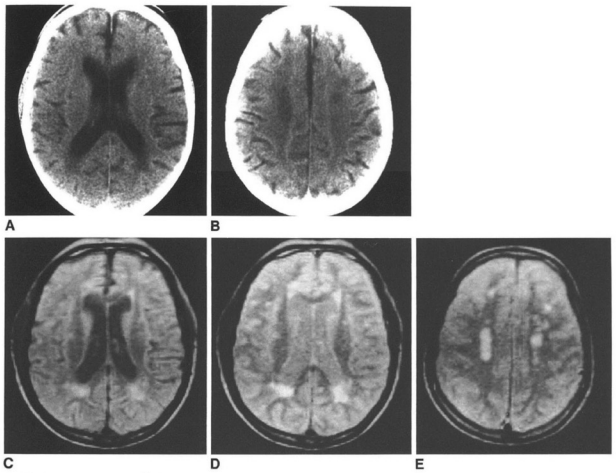
Magnetic resonance (MR) imaging studies of the brain in five el non-Alzheimer dementia were compared with those in two groups control subjects. Group 1 included five subjects aged 59–66; grou subjects aged 74–81. In all of the demented patients and in three of older control group, MR showed diffuse, patchy white-matter lesions. used to grade the severity of the changes. The results suggest a h white-matter lesions in elderly patients with non-Alzheimer dementia normal elderly with advancing age.

The unprecedented sensitivity of magnetic resonance (MR) ima pathologic alterations of the central nervous system [1–5] has y results when applied to the aging brain. For instance, 20%–30% the age of 65 demonstrate patchy, deep white-matter foci of intensity when examined by MR [6]. Because these foci appear clinical indication for the MR study, they present a diagnostic dile foci are virtually absent in normal individuals under age 50, they a to the aging process. One possibility is that they are of lit significance. Another alternative is that the foci are both pathol significant, since they match the distribution of periventricular lu often with computed tomography (CT) in aged patients with atro and in patients with multiinfarct dementia [8–11]. If these deep are pathologic, it is possible that they represent edema and/ secondary to ischemia.

There is a known association of subcortical arteriosclerotic ence as well as multiple foci of infarction with aging and dementia [7, 9 foci of abnormal signal intensity in the elderly discussed above seen in known cerebral infarction on MR [14]. The high incidence matter lesions (PWMLs) in the aging brain may be due to ischem that these lesions are an MR marker of cognitive change is th analysis.

It is currently estimated that of the more than 24 million elderl have severe dementia and 10% have mild to moderate demer likely that the number of elderly with dementia will increase in th the median age of our population increases. Dementia can dysfunction in more than one of the four major cognitive ability memory, reasoning, and construction. It must be differentiatec decrements in cognitive abilities of *normal* aging. Diagnostic i including CT, have generated controversy regarding their ability parenchymal changes due to normal senescence [18–21]. Likewise, the correlation between those changes observed with CT (e.g., enlarged ventricles) and detectable loss of cognitive function has been unconvincing [22–27].

It is currently believed that 50% of senile dementias are of Alzheimer type



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[1]Department of Radiology, C309, University of
California, San Francisco, San Francisco, CA
94143. Address reprint requests to M. Brant-Za
wadzki.

[2]Department of Psychiatry, University of Califor
nia, San Francisco, CA 94143.

[3]Department of Psychiatry, Veterans Administra
tion Medical Center, San Francisco, CA 94121.

[4]Department of Anatomy, University of Califor
nia, San Francisco, CA 94143.

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