AJNR

Celebrating 35 Years of the AJNR: November 1985 edition

AJNR Am J Neuroradiol 2020, 41 (11) 2171
doi: https://doi.org/10.3174/ajnr.P0102
http://www.ajnr.org/content/41/11/2171

Celebrating 35 Years of the AJNR

November 1985 edition

Contrast-Enhanced MR Imaging of Malignant Brain Tumors

Moshe Graif[1]
Graeme M. Bydder[1]
Robert E. Steiner[1]
Peter Niendorf[2]
David G. T. Thomas[3]
Ian R. Young[4]

Magnetic resonance (MR) imaging was performed before and serially after intravenous injection of 1 mmol/kg gadolinium-DTPA (Schering) in 17 patients with clinical and histologic diagnoses of malignant cerebral tumors. There was a decrease of 1% in T1 and 10% in T2 in normal white matter and a decrease of 8% in T1 and 14% in T2 in normal gray matter. Contrast enhancement was observed in 16 of the 17 tumors. In the region of maximal enhancement a mean decrease of 16% in T1 was observed in low-grade gliomas, a mean decrease in T1 of 29% was seen in high-malignancy gliomas, and a mean decrease in T1 of 33% was observed in metastases. The decreases in T1 persisted for at least 50 min. In one case the central cystic region of the tumor displayed a decrease in T1 and T2. Measurements of signal intensity displayed maximal contrast enhancement with an IR 1500/500/44 sequence, much less with SE 1500/44, and least with SE 1500/80. Edema was observed on precontrast images in 14 cases, but satisfactory definition of the tumor-edema margin was only possible in four cases. After contrast enhancement this margin was defined in 10 cases. In four of the 17 cases areas of apparent "edema" seen before administration of Gd-DTPA displayed significant contrast enhancement and probably represented tumor infiltration. Comparison with CT showed a greater degree of contrast enhancement on MR images in eight cases, an equal degree in eight cases, and greater enhancement on CT in one case. Definition of the tumor-edema interface was better with MR in six cases and equal to CT in four cases. No significant toxic effects were found with the contrast agent. Gd-DTPA provided significant additional information over unenhanced MR imaging and enhanced CT.

The value of contrast enhancement was recognized soon after the introduction of cranial CT [1, 2]. The situation with magnetic resonance (MR) imaging is more complex. A greater level of soft-tissue contrast is available without contrast enhancement, and, unlike CT, no contrast agents suitable for parenteral use were available when the technique was first introduced. Nevertheless, particular situations have been defined, such as differentiation between tumor and edema, where contrast enhancement might be useful [3, 4], and recently the paramagnetic contrast agent gadolinium-DTPA has been tested in animals [5, 6] and used in clinical pilot studies [7–9]. In this report we extend our earlier clinical studies by

Received March 6, 1985; accepted after revision June 12, 1985.

This work was supported in part by Schering A.G., Berlin (Gd DPTA), and Medical Research Council, Department of Health and Social Security.

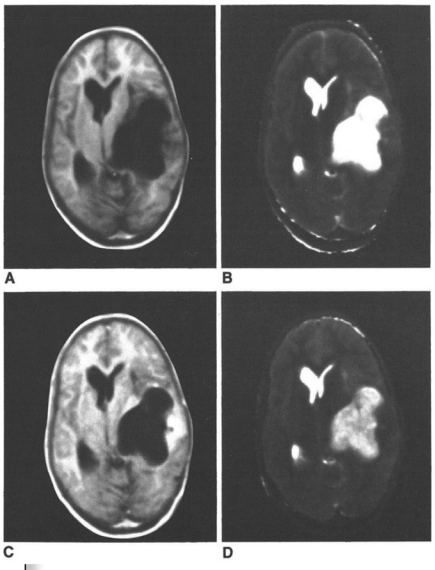
[1] Department of Diagnostic Radiology, Royal Postgraduate Medical School, Hammersmith Hospital, Du Cane Rd., London W12 OHS, United Kingdom. Address reprint requests to M. Graif, NMR Unit.

[2] Schering AG, Berlin, West Germany.

[3] Department of Neurosurgery, Maida Vale Hospital, Maida Vale, London W9, United Kingdom.

[4] Picker International, Hirst Research Centre, Wembley, Middlesex, United Kingdom.

AJNR 6:855–862, November/December 1985
0195–6108/85/0606–0855



Cavernous Sinus Invasion by Pituitary Adenomas

Jamshid Ahmadi[1]
Charles M. North[1]
Hervey D. Segall[1]
Chi-Shing Zee[1]
Martin H. Weiss[2]

One hundred ninety-eight surgically explored pituitary adenomas were evaluated preoperatively by high-resolution computed tomography (CT). At surgery, evidence of direct cavernous sinus invasion was demonstrated in 19. CT findings in these cases included cavernous sinus expansion (17 patients) and visible encasement of the internal carotid artery (14 patients). The invasive tumor often enhanced to a lesser degree than the cavernous sinuses and ipsilateral internal carotid artery. Intracavernous cranial nerve compression, obliteration, or displacement (14 patients), invasion of the lateral wall of the cavernous sinus (seven patients), and diffuse bone destruction (seven cases) were other findings. Magnetic resonance imaging in three patients provided excellent demonstration of intracavernous internal carotid artery encasement, but displacement and obliteration of intracavernous cranial nerves was not shown as well as it was with CT. Histologically, only three patients showed anaplastic features and only one of them had distant metastases. There was no correlation between histologic features, hormone assays, and invasiveness. This experience indicates any type of pituitary adenoma, regardless of its endocrinologic activity, can invade the cavernous sinus. Cavernous sinus involvement makes complete surgical removal difficult. Preoperative recognition of invasive behavior of these tumors has prognostic value and aids in designing appropriate management. CT is the most useful technique generally available for evaluation and follow-up.

This article appears in the Ne
ber 1985 issue of *AJNR* and th
issue of *AJR*.

Received December 12, 198
revision May 14, 1985.

[1] Department of Radiology, Se
diology, University of Southern C
Medicine, Los Angeles, CA 9003
requests to J. Ahmadi, LAC/USC
Box 2, 1200 N. State St., Los An

[2] Department of Neurological S
of Southern California School of
geles, CA 90033.

AJNR 6:893–898, November/De
0195–6108/85/0606–0893