Radiology

HOME | HELP | FEEDBACK | SUBSCRIPTIONS | ARCHIVE | SEARCH | TABLE OF CONTENTS

QUICK SEARCH: [advanced]
Author: Keyword(s):
Go
Year: Vol: Page:

(*Radiology.* 2000;217:377-384.)
© RSNA, 2000

This Article
- Figures Only
- Full Text
- Full Text (PDF)
- Submit a response
- Alert me when this article is cited
- Alert me when eLetters are posted
- Alert me if a correction is posted
- Citation Map

Services
- Email this article to a friend
- Similar articles in this journal
- Similar articles in PubMed
- Alert me to new issues of the journal
- Download to citation manager
- © Get Permissions

Citing Articles
- Citing Articles via HighWire
- Citing Articles via Google Scholar

Google Scholar
- Articles by Kumar, A. J.
- Articles by Levin, V. A.
- Search for Related Content

PubMed
- PubMed Citation
- Articles by Kumar, A. J.
- Articles by Levin, V. A.

Neuroradiology

Malignant Gliomas: MR Imaging Spectrum of Radiation Therapy- and Chemotherapy-induced Necrosis of the Brain after Treatment[1]

Ashok J. Kumar, MD, Norman E. Leeds, MD, Gregory N. Fuller, MD, PhD, Pamela Van Tassel, MD [2], Moshe H. Maor, MD, Raymond E. Sawaya, MD and Victor A. Levin, MD

[1] From the Division of Diagnostic Imaging (A.J.K., N.E.L., P.V.T.), and the Departments of Pathology (G.N.F.), Radiation Oncology (M.H.M.), Neurosurgery (R.E.S.), and Neuro-Oncology (V.A.L.), University of Texas M.D. Anderson Cancer Center, Box 57, 1515 Holcombe Blvd, Houston, TX 77030. From the 1995 RSNA scientific assembly. Received October 20, 1999; revision requested November 19; final revision received March 17, 2000; accepted April 24. V.A.L. and G.N.F. supported in part by NIH grant CA 55261. **Address correspondence to** A.J.K. (e-mail: *akumar@mdanderson.org*).

PURPOSE: To describe both the common and less frequently encountered magnetic resonance (MR) imaging features of radiation therapy– and chemotherapy-induced brain injury, with particular emphasis on radiation necrosis.

MATERIALS AND METHODS: A cohort of 148 adult patients underwent surgical resection of malignant brain (glial) tumors and were subsequently entered into a research protocol that consisted of accelerated radiation therapy with carboplatin followed by chemotherapy with procarbazine, lomustine, and vincristine. Patients typically underwent sequential MR imaging at 6–8-week intervals during the 1st year and at 3–6-month intervals during subsequent years. In all patients, histopathologic confirmation of lesion composition was performed by board-certified neuropathologists.

RESULTS: The patients exhibited different types of MR imaging–detected abnormalities of the brain: pure radiation necrosis in 20 patients, a mixture of predominantly radiation necrosis with limited recurrent and/or residual tumor (less than 20% of resected tissue) in 16 patients, radiation necrosis of the cranial nerves and/or their pathways in two patients, radiation-induced enhancement of the white matter in 52 patients, and radiation-induced enhancement of the cortex in nine patients.

CONCLUSION: The frequent diagnostic dilemma of recurrent neoplasm versus radiation necrosis is addressed in this study through a description of the varying spatial and temporal patterns of radiation necrosis at MR imaging.

Index terms: Brain, necrosis, 13.47 • Brain neoplasms, 13.363 • Brain neoplasms, MR, 13.121411, 13.121415, 13.12143 • Brain neoplasms, therapeutic radiology • Radiations, injurious effects, complications of therapeutic radiology, 13.47

Radiology Radiology Radiology Radiology Radiology Radiology diology

This article has been cited by other articles:

JOURNAL OF CLINICAL ONCOLOGY HOME

A. A. Brandes, E. Franceschi, A. Tosoni, V. Blatt, A. Pession, G. Tallini, R. Bertorelle, S. Bartolini, F. Calbucci, A. Andreoli, *et al.*
MGMT Promoter Methylation Status Can Predict the Incidence and Outcome of Pseudoprogression After Concomitant Radiochemotherapy in Newly Diagnosed Glioblastoma Patients
J. Clin. Oncol., May 1, 2008; 26(13): 2192 - 2197.
[Abstract] [Full Text] [PDF]

American Journal of Roentgenology HOME

P. Weybright, P. C. Sundgren, P. Maly, D. G. Hassan, B. Nan, S. Rohrer, and L. Junck
Differentiation Between Brain Tumor Recurrence and Radiation Injury Using MR Spectroscopy
Am. J. Roentgenol., December 1, 2005; 185(6): 1471 - 1476.
[Abstract] [Full Text] [PDF]

American Journal of Neuroradiology HOME

M. E. Mullins, G. D. Barest, P. W. Schaefer, F. H. Hochberg, R. G. Gonzalez, and M. H. Lev
Radiation Necrosis Versus Glioma Recurrence: Conventional MR Imaging Clues to Diagnosis
AJNR Am. J. Neuroradiol., September 1, 2005; 26(8): 1967 - 1972.
[Abstract] [Full Text] [PDF]

American Journal of Neuroradiology HOME

C. Asao, Y. Korogi, M. Kitajima, T. Hirai, Y. Baba, K. Makino, M. Kochi, S. Morishita, and Y. Yamashita
Diffusion-Weighted Imaging of Radiation-Induced Brain Injury for Differentiation from Tumor Recurrence
AJNR Am. J. Neuroradiol., June 1, 2005; 26(6): 1455 - 1460.
[Abstract] [Full Text] [PDF]

Neurology HOME

M. C.Y. de Wit, H. G. de Bruin, W. Eijkenboom, P. A.E. Sillevis Smitt, and M. J. van den Bent
Immediate post-radiotherapy changes in malignant glioma can mimic tumor progression
Neurology, August 10, 2004; 63(3): 535 - 537.
[Abstract] [Full Text] [PDF]

American Journal of Neuroradiology HOME

P. A. Hein, C. J. Eskey, J. F. Dunn, and E. B. Hug
Diffusion-Weighted Imaging in the Follow-up of Treated High-Grade Gliomas: Tumor Recurrence versus Radiation Injury
AJNR Am. J. Neuroradiol., February 1, 2004; 25(2): 201 - 209.
[Abstract] [Full Text] [PDF]

JOURNAL OF CLINICAL ONCOLOGY HOME

M. J. Vos, O. S. Hoekstra, F. Barkhof, J. Berkhof, J. J. Heimans, C. J. van

Radiology Radiology Radiology Radiology Radiology Radiology diology

Groeningen, W. P. Vandertop, B. J. Slotman, and T. J. Postma
Thallium-201 Single-Photon Emission Computed Tomography As an Early Predictor of Outcome in Recurrent Glioma
J. Clin. Oncol., October 1, 2003; 21(19): 3559 - 3565.
[Abstract] [Full Text] [PDF]

Neurology HOME

M.J. Vos, B.M.J. Uitdehaag, F. Barkhof, J.J. Heimans, H.C. Baayen, W. Boogerd, J.A. Castelijns, P.H.M. Elkhuizen, and T.J. Postma
Interobserver variability in the radiological assessment of response to chemotherapy in glioma
Neurology, March 11, 2003; 60(5): 826 - 830.
[Abstract] [Full Text] [PDF]

JOURNAL OF NEUROLOGY, NEUROSURGERY, AND PSYCHIATRY HOME

V Biousse, N J Newman, S B Hunter, and P A Hudgins
Diffusion weighted imaging in radiation necrosis
J. Neurol. Neurosurg. Psychiatry, March 1, 2003; 74(3): 382 - 384.
[Abstract] [Full Text] [PDF]

Neurology HOME

A. Boiardi, T. J. Postma, M. J. B. Taphoorn, M. J. van den Bent, A. C. Kappelle, and J. J. Heimans
PCV chemotherapy for recurrent glioblastoma multiforme
Neurology, June 26, 2001; 56(12): 1782 - 1782.
[Full Text] [PDF]

HOME | HELP | FEEDBACK | SUBSCRIPTIONS | ARCHIVE | SEARCH | TABLE OF CONTENTS
RADIOLOGY | RADIOGRAPHICS | RSNA JOURNALS ONLINE

Copyright © 2000 by the Radiological Society of North America.