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The WCC Note™

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A Weekly Guide To Harmonizing Clinical Trial Imaging

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MRI GLIOMAS

MRI Can Predict Progression of Brain Gliomas

A study headed by researchers from Mount Sinai Medical Center in New York City evaluated 189 patients with cerebral gliomas using dynamic contrast-enhanced perfusion MR, then followed them both clinically and with MR imaging. The relative cerebral blood volume (CBV) measurement within the tumor was correlated with clinical outcomes and follow-up MR findings. A strong correlation was found, showing that patients with relative CBV measurements of more than 1.75 showed much more rapid progression, with a median progression time of 265 days, as compared to those with CBV of less than 1.75, who had a median progression time of 3,585 days. Relative CBV was found to be an independent predictor of clinical outcome.[1] **Conclusion: Dynamic contrast-enhanced MRI can be used to predict progression in patients with gliomas, independent of pathologic findings.**

EDITORS' NOTE: *Gliomas may be categorized according to their grade, as determined by the pathologic evaluation of the tumor. The most widely used grading system for astrocytoma (one of the four main types of gliomas) was developed by the World Health Organization. The WHO's system assigns a grade from 1 to 4, with 1 being the least aggressive and 4 being the most aggressive:*

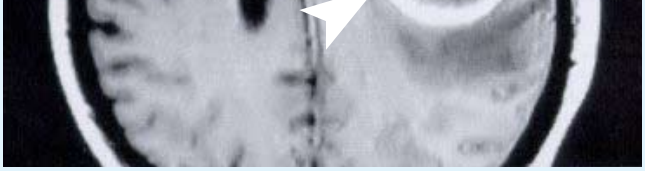
- ***Grade 1*** *– for example, pilocytic astrocytoma*
- ***Grade 2*** *– for example, diffuse or low-grade astrocytoma*
- ***Grade 3*** *– for example, anaplastic (malignant) astrocytoma*
- ***Grade 4*** *– for example, glioblastoma multiforme (the most common glioma in adults)*

The prognosis is poorest for patients with grade 4 gliomas, with an average survival time of one year. Overall, few patients with gliomas survive longer than three years. However, low-grade gliomas grow slowly, often over many years, and can be followed without treatment unless they grow and cause symptoms.[2,3]

SNAPSHOT:
MR Imaging of Brain Tumors

- MRI has an extraordinary ability to differentiate between different types of tissues, making it the study of choice for evaluating brain tumors. Because MRI relies on the water and fat content of tissues, it is very sensitive for the detection of masses in the brain, as well as the resultant edema that surrounds the masses.
- It's also the best way to assess a mass in the brain to determine if it is a benign or malignant tumor.

- Because MRI is very good at detecting small tumors in the brain, particularly after the administration of gadolinium, it is the study of choice to detect metastases in a patient with known cancer elsewhere in the body.
- It's also the best test for determining the extent of brain cancer, in order to evaluate which treatment options are best. In addition, traditional MRI in combination with diffusion tensor imaging can localize the margins of a tumor to assist in surgical planning.



T1-weighted MRI with gadolinium contrast, showing a typical glioblastoma multiforme (arrow).

- In evaluating a brain tumor's response to treatment, MRI has great value. It can assess changes in tumor vascularity and size and, in combination with MR spectroscopy and diffusion-weighted imaging, help distinguish areas of recurrent tumor from radiation necrosis.

CT HEAD AND NECK CANCER

CT Predicts Clinical Outcome of Head and Neck Cancer Treatment

In a study headed by researchers from Wake Forest University in Winston-Salem, North Carolina, patients with head and neck cancer were followed with CT after treatment to evaluate for response in the neck. One hundred and three (103) patients with stage III or stage IV node-positive head and neck cancer received either radiotherapy or chemotherapy, with post-treatment CT scans performed for a median of 42-month follow-up. Post-treatment CT was categorized as either "radiographic complete response" or "radiographic partial response," and this was correlated with the patient's ultimate nodal control in the neck. Patients who showed "complete response" on CT and had a neck dissection had a nodal control rate of 94%, while those with CT "complete response" and no neck dissection performed ultimately had a similar nodal control rate of 97%. In contrast, those with CT "partial response" benefitted from neck dissection, with a nodal control rate of 94% with dissection and 73% without.[4] **Conclusion: CT can definitively show complete response of cervical lymph nodes in head and neck cancer to therapy, obviating the need for adjuvant neck dissection in some patients.**

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4. Greven KM, Williams DW, Browne JD, *et al.* "Radiographic Complete Response on Post-Treatment CT Imaging Eliminates the Need for Adjuvant Neck Dissection after Treatment for Node-Positive Head and Neck Cancer." *American Journal of Clinical Oncology* 2008; 31:2.

NEXT ISSUE: BREAKING NEWS AND STUDIES IN CLINICAL TRIAL IMAGING

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