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that issue. At the same time, the type size will decrease, allowing publication of more papers per issue. We will list and continually update the Web page addresses for journals in allied neuroscience fields who carry full abstracts of their published articles. Our readers can then directly access articles that might interest them. While changes in any endeavor are often met with skepticism, it is my hope that these alterations in the *AJNR*'s appearance will be viewed positively.

Because many of our readers are unfamiliar with the mechanisms by which a journal is produced and managed, it is valuable to mention that the central office of the American Society of Neuroradiology has become the headquarters for the *Journal* staff. The need for the editor-in-chief to be at the clerical center of a journal's operation is no longer necessary, given the current ease of electronic communication between staff and editor. I believe that the incorporation of the *Journal* into our Society's central office will improve our efficiency and will help ensure that in future years the *Journal*'s headquarters will remain centrally located.

Neuroradiology plays a central and ever-expanding role in the evaluation and treatment of patients with abnormalities of the nervous system. The *AJNR* will continue as a key journal for those physicians involved in the diagnosis and care of patients with neurologic disorders and for those scientists in allied fields whose contributions will advance the discipline of neuroradiology.

ROBERT M. QUENCER
Editor-in-Chief

Morphometric MR Uncovers Dual Pathology

Brain damage and seizures go hand in hand. As neuroradiologists, we are seldom surprised by the coexistence of an injured brain on high-resolution MR and the clinical presentation of seizures. Indeed, seizures at any age are one of the single most common indications for neuroimaging today. In this issue of the *AJNR*, Ho et al show that modern neuroimaging can provide far more insight into the semiology of epilepsy than merely an explanation for its existence. In an excellent example of clinical-imaging correlation, the authors show that in the presence of a more obvious lesion (such as congenital porencephaly), a closer look often reveals remote injury that better explains the clinical presence of seizures, how they develop over time, and how they may be managed in the future. Within their study population, the authors found a high incidence of both hippocampal atrophy

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(in 21 of 22 subjects) and amygdalar atrophy (in 12 of 22 subjects) remote from the primary porencephalic lesion. Of even greater interest was their finding that the presence of both hippocampal and amygdalar atrophy correlated more closely with seizure symptoms than with the location of the porencephalic cyst. While very few had surgical intervention, in the four subjects undergoing partial temporal lobe resection, all remained seizure free in a relatively short follow-up period ranging from 6 to 18 months. Of further interest is that in each of these, pathologic findings from the temporal lobe was consistent with mesial temporal sclerosis.

Several points in this article deserve further emphasis. The first is the concept of "dual pathology," represented in this study by the coexistence of porencephaly and amygdalar-hippocampal atrophy in the same patient. The concept of dual pathology is not new, but is often forgotten in neuroimaging, in which we often focus more on the obvious, and sometimes less on the more clinically relevant. While there is no evidence to determine whether the temporal lobe injury was secondary or synchronous to the porencephaly, it was clear from this study that the changes in the temporal lobe represented the more clinically relevant disease. Such lesions must be looked for carefully, especially when the clinical presentation fails to fit the location or severity of the more obvious neuroimaging findings. The authors speculate on the origin of dual pathology, but an exact explanation for the simultaneous existence of significant lesions eludes us. A weakness in Ho et al's study is the absence of sequential examinations over time, which might help determine whether the atrophic changes in the hippocampus and amygdala temporally differ from the primary lesion.

It is clear from this study that additional information from the neuroimaging examination of the future will be possible because of more advanced postprocessing applications, such as those that enable accurate measurement of tissue volume. Hippocampal volume appeared to be decreased in only 17 of 22 subjects, while corrected volumetric analysis showed volume loss in 21 of the 22 subjects. It should be emphasized, however, that by today's means, repeatable and accurate volumetric analysis is no easy task. Off-the-shelf solutions available today are often inconsistent, time consuming, and of questionable accuracy. They are not quite ready for the day-to-day practice of neuroradiology, and must be subjected to strenuous validation before becoming accepted. Mathematical normalized corrections for both patient size and age are just two of the technical problems facing accurate volumetric determination. Bilateral disease as determined by volumetry can easily go unnoticed without the benefit of age-matched control subjects. Despite such problems, the authors clearly

show that volumetry not only can be done accurately, but also can provide validation of the presence of disease not obvious by qualitative interpretation. In the future, other advanced applications such as perfusion and diffusion imaging might benefit from the accurate determination of the pathologic volume. This study is certainly a step in the right direction.

WILLIAM S. BALL, JR
Senior Editor

MR Spectroscopy of Temporal Lobe Epilepsy: Good News and Bad News

While temporal lobe epilepsy remains a clinical challenge, recent advances in diagnosis and treatment have significantly improved patient outcome. Scalp electroencephalography (EEG) has been improved by higher-density montages and computer-assisted analysis, resulting in a greater percentage of patients with clearly defined electrical foci. MR can now show most gross lesions, including tumors and encephalomalic processes. In addition, high-resolution MR of the temporal lobes shows most cases of mesial temporal sclerosis, the most common cause of temporal lobe epilepsy (TLE) (1, 2). The combination of these two techniques yields concordant (ie, colateralizing) results in approximately 90% of patients. Approximately 80% of patients with appropriate clinical history and concordant EEG and MR findings will respond favorably to careful medial temporal lobe surgical resections, though there remains a need for longer-term follow-up to document treatment outcome better (3).

Numerous additional imaging studies, including fludeoxyglucose F 18 (FDG) positron emission tomography (PET) and, more recently, single-photon emission computed tomography (SPECT) and MR spectroscopy, have been proposed to locate epileptogenic foci. However, there is little convincing evidence that they add significantly to treatment in patients with TLE and concordant EEG and MR findings.

Despite these diagnostic and therapeutic improvements, there do remain many problematic patients, particularly those with nonconcordant EEG and MR findings and those with non–temporal lobe epilepsy. Although TLE remains a clinical challenge, imaging research should now begin to focus on these patients (4).

The article by Achten et al in this issue of the *AJNR* nicely correlates single-voxel proton MR spectroscopic and FDG PET findings in patients with TLE. They confirm previous reports that MR spectroscopic measures of *N*-acetylaspartate and choline and decreased interictal FDG PET uptake have a strong correspondence to scalp EEG and MR findings. However, in EEG and MR concordant patients, neither study seems to affect patient treatment significantly, and they present no evidence that they improve the prediction of these patient's clinical outcome. While MR spectroscopy and FDG PET do not seem to be important in the evaluation of concordant TLE patients, they may prove valuable in the evaluation of the problematic discordant TLE and non-TLE patients. In this group of patients, current diagnostic techniques clearly are inadequate as reflected by generally poor control of seizures by current treatment regimens (5). However, the single-voxel technique of Achten et al will become an

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increasing problem when addressing non-TLE patients. Even in TLE subjects, the single-voxel technique suffers from limited site sampling and partial volume averaging. In non-TLE patients, there may be no or few clues as to where to place the MR spectroscopic voxels. Multivoxel MR spectroscopic imaging, while much more technologically demanding, will probably be required for the more difficult epilepsy evaluations (6).

However, the needed clinical investigations are very demanding, especially in light of the relative small number of patients, the lack of a well-defined pathologic cause, and the necessity of long-term patient follow-up to ascertain outcome. To design a traditional randomized study properly under these conditions is very difficult; actually to complete such a study might be so impractical as to be impossible—that is the bad news. However, this challenge must now be addressed by any new epilepsy diagnostic technique as clinical history, EEG, and MR now appear to direct treatment of most TLE patients adequately, which is, of course, the good news.

R. NICK BRYAN
Senior Editor

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