Editorial

Temporal lobectomy

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The article by Elliott and colleagues in the Journal of Neurosurgery describes their experience with anterior temporal lobectomy for cases of pathologically proven mesial temporal sclerosis (MTS). The authors describe a retrospective analysis of their series of 116 consecutive patients with uniform pathology of MTS and fully concordant data of semiology, MRI findings, and electroencephalography (EEG). Their stated primary goal was to retrospectively identify predictors of long-term seizure outcome. The major finding was that “less disparity in the Wada memory scores between the ipsilateral and contralateral sides was associated with persistent seizures.”

To begin, the authors should be congratulated for their excellent epilepsy outcomes in this series with long-term follow-up (89% modified Engel Class I at 6.7 years of median follow-up) and the fact that their late seizure recurrence rate was lower than in most series. The authors point out that the highly selected group of patients treated can explain much of the favorable outcome but perhaps not all. The patient group evaluated in this article is the one most likely to do well with epilepsy surgery: pathologically proven MTS, positive MRI findings in 89% (presumably showing MTS), concordant EEG findings, no dual pathology, no discordant data, and no need for preresection implanted electrode recording. The advantage offered in this paper is that this uniformity avoids the heterogeneity problem that hampers analysis in many temporal lobe series. On the other hand, since the failures are relatively few (13 cases in this series), statistical analysis is limited. Nonetheless, the authors’ results are commendable. I would be curious to know the superior surgical extent of their amygdala resection, as this was the only surgical parameter not reported.

The main focus of the article is the finding that the difference in preoperative Wada memory scores between the hemispheres was predictive of the epilepsy outcome in a post hoc analysis. This finding has been reported in the past by this group and by others. What makes this article stronger than past reports is the larger number of highly uniform patients. This article extends the argument by some that the Wada test should still be routinely used in temporal lobe epilepsy presurgical evaluation, not just for speech lateralization but also for the investigation of memory as a marker for mesial temporal dysfunction. How strong is the evidence presented? The strengths of the study are the uniformity of the patient population, a uniform operative procedure, uniform pathology, and the standardized evaluation by an experienced neurology and epilepsy surgery team. The weaknesses (acknowledged by the authors) are the retrospective design, the lack of hippocampal volumetrics, lack of postresection MRI findings, and lack of pathological sclerosis grading that may have allowed for an analysis of correlation between Wada memory deficits and the degree of sclerosis noted.

The Wada test traditionally has been used in epilepsy surgery as a language lateralization tool and to predict and avoid postresection global amnesia. Extending this memory evaluation, some groups have used Wada memory scores as a marker for mesial temporal dysfunction and have correlated this with neuropsychological outcomes and degree of sclerosis after resection. Over the past decade, several reports have questioned the usefulness and reliability of Wada testing. With the advance of noninvasive alternatives to Wada for language lateralization and memory testing (functional MRI [fMRI] and magnetoencephalography [MEG]), Wada testing is becoming more selective and less common at some centers. In addition, more centers are performing limited cortical resections or selective amygdalohippocampectomies in cases of MTS. This reduces risk to speech function, making speech localization less critical. Some centers remain unconvinced of the reliability of Wada memory data in their own experience, preferring to rely on neuropsychological testing. Finally, modern Wada testing has a limited but well-described risk profile. Although the authors have a highly skilled angiography team and reported no morbidity, this is not universally the experience at other centers. A recent international survey of experienced European centers reported a range of 0–3% permanent complications from Wada testing. One recent report from an experienced center in the US reported a 10% complication rate (1% was permanent).

It is important to note that recent surveys of epilepsy centers that perform Wada testing showed that few centers rely on Wada hemispheric memory difference as a predictive factor. Why not? A major issue is that the findings in this study may be difficult to reproduce at other centers due to variability in Wada tests between centers. Some centers perform Wada testing unilaterally, injecting only the proposed surgical side, some bilaterally. Some perform the
testing in 1 day and some over 2 days to avoid lingering effects of the first injection. Some do selective catheterization of the posterior cerebral artery to avoid confounding speech problems. Other variables include the agent and dose used, as well as the amount of time patients are allowed to recover before testing. Individual patients show variability in mesial temporal blood supply (the extent of anterior versus posterior circulation supply to the hippocampus) and may be affected differently by a carotid injection. Finally, memory testing is also not uniform among centers. In fact in this paper the extensive tests listed were “tailored to individual patients”; thus the memory testing at this center is not entirely uniform. It would be instructive to any center trying to duplicate these results for the authors to report how the tests are tailored. It should be simple enough for other centers that maintain a prospective database to see if the Wada memory differential is as useful in predicting epilepsy outcome in MTS cases in their experience as it has been for the authors.

If this predictive value of hemispheric memory score differences in this highly selective group holds at other centers, practical questions of application arise. For instance, a medically intractable right-handed patient with right MTS on MRI, concordant ictal and interictal EEG findings, and neuropsychological test results consistent with right hemispheric dysfunction is precisely the sort of patient that many centers would suggest does not need a Wada test. In this case, if a Wada test is done that shows the median memory score differential of the patients who were not seizure free in this series, would this person not be offered surgery? I doubt this is the intent of the authors; however, a practical guide describing how to use these data in counseling patients would be useful.

There remains the practical matter of how much we need this additional information. According to recent surveys, Wada usage in epilepsy surgery is much less common in Europe and other countries than in the US. As health care in the US comes under more cost pressure, the next generation of epilepsy surgeons and epileptologists will be forced to make some difficult resource choices. The choice to use Wada testing in well-localized cases of MTS will force most centers to choose to not use some other resource. What will each center choose?

In guiding these inevitable choices, it would be valuable if the authors could use their considerable experience to narrow down to a subset of patients for whom Wada testing gives definitive information not available in neuropsychological testing, MRI, and EEG and could thus be used more selectively. Looking more widely, even greater value would come from finding innovative ways to use Wada in predicting outcomes of our most problematic cases such as nonlesional, extratemporal cases or cases with discordant data. I look forward to more publications from this group on this important and timely topic.

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Disclosure

The author performs instrument design consultant work for Stryker.

References


Response

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