

WILL THE REAL TEMPORAL LOBE EPILEPSY IN CHILDHOOD PLEASE STAND UP?

The Pathological Basis of Temporal Lobe Epilepsy in Childhood

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PURPOSE: To characterize the pathologic findings of temporal lobe epilepsy (TLE) in children undergoing temporal lobectomy for refractory seizures and to correlate these findings with clinical presentation.

METHODS: The authors reviewed the charts of all children who underwent anterior temporal lobectomy for refractory TLE from 1979 through 1999. A new neuropathologic analysis was performed blinded to clinical features and outcome.

RESULTS: Twenty-two children met inclusion criteria. Mean age at onset of epilepsy was 3 years, 7 months (range, 1 month to 10 years). Mean age at surgery was 10 years, 11 months (range, 1–18 years). All patients had complex partial seizures, 48% with secondary generalization. Most had daily seizures. Auras were reported in 45% of patients. Postresection follow-up averaged 5 years, 2 months (range, 2–19 years). Seizure-free status was achieved in 41% of patients, and 14% had residual auras only. The most frequent neuropathologic abnormalities were cortical dysplasia (CD) of the temporal neocortex (14 of 22) and mesial temporal sclerosis (MTS; 12 of the 15 children with available hippocampal tissue). These two findings coexisted in seven children. MTS was associated with extrahippocampal pathology in eight (67%) of 12 cases.

CONCLUSIONS: MTS occurs frequently in association with CD in this population of children. The high incidence of dual pathology could explain the early age at seizure onset and high seizure-frequency rate observed. TLE in childhood may constitute a different entity from that in adults, from both the clinical and neuropathologic perspectives.

COMMENTARY

Bocfi et al. are right. Prospective studies with standardized diagnostic criteria, high-resolution imaging, and detailed neuropathologic analysis are needed if we hope to understand temporal lobe epilepsy (TLE) in childhood. We need to understand it because it is very different from adult TLE. We need to understand it to find ways to recognize its nature earlier, to offer appropriate surgical intervention in a more timely manner, and, we hope, to prevent the significant sequelae of intractable epilepsy. However, the authors unfortunately continue to contribute to the difficulties in comparing one article with another. Although they readily recognize that half their cases were operated on before current neuroimaging, no attempt is made to integrate their classification scheme with the type of malformations of cortical development proposed by Barkovich et al. (1). The authors do not even discuss the relation of microdysgenesis (MD) that occurred in 13 of 22 to mesial temporal sclerosis (MTS). We need an integrated system that will allow us to understand the pathophysiology of this disorder so that more intelligent therapies can be derived.

This article continues to delineate the differences that exist between TLE in children and adults. The numbers are small: only 22 cases for study in 20 years at one of the world's foremost epilepsy surgery centers. These children begin to have seizures much earlier than the typical surgical TLE population (5 years, 7 months vs. 14.6 years) (2), and declare their apparent intractability and come to surgery within an average of 7 years, 4 months, unlike the recently reported study by Berg (2) in which the mean was 22 years. These children exhibited a suggestion of much more widespread pathologic dysfunction than is seen in TLE because 68% had significant development, behavioral, or language problems. The frequency of specific dual pathology with MTS + cortical dysplasia (CD) is striking, seen in seven (47%) of 15, with some aspect of dual pathology seen in 10 (67%) of 15. This prevalence is similar to the report of Mohamed et al. (3), who noted that 79% of their pediatric cases had dual pathology; both are higher than the 15–43% suggested in adult series.

The hypothesis that MTS typically develops as a result of ongoing seizures appears less valid in the face of these

pediatric data. Why is MTS rarely an isolated phenomenon in children, even in the face of very frequent seizures? The authors suggest some explanations: genetic and acquired factors that may contribute to abnormal cortical development and also affect the hippocampus, or that CD itself increases the vulnerability of the hippocampus to seizure-induced changes. This apparent linkage underscores the need for more comprehensive study of this population (imaging, including studies such as diffusion tensor imaging that might give clues to interconnectivity, a cohesive framework to examine the neuropathology, and collaboration to determine the best treatments for these children). Whatever the relation of these phenomena, and whatever intractable TLE in childhood represents (including dual pathology), the children respond well to thorough surgical resection, with >50% having class I or II outcomes

in the Bocti article, and 90% reported seizure free by the Cleveland group (3).

by Eileen P. G. Vining, M.D.

References

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