

COGNITIVE AGING AFTER ATL

Early and Late Cognitive Changes Following Temporal Lobe Surgery for Epilepsy

Rausch R, Kraemer S, Pietras CJ, Le M, Vickrey BG, Passaro EA

Neurology 2003;60:951–959

OBJECTIVE: To evaluate early and late postoperative cognitive changes in adult patients who had a standardized temporal lobe resection for control of intractable complex partial seizures and to relate quality-of-life measures at the long-term follow-up to seizure control and verbal memory skill.

METHODS: Patients in this longitudinal study had intractable epilepsy and had cognitive tests at the initial surgical evaluation, 1 year later, and at a long-term follow-up (at least 9 years later). Mean follow-up was 12.8 years. Participants were 44 patients who had an en bloc left (LTL) or right (RTL) temporal lobe resection and eight nonsurgical patients with epilepsy.

RESULTS: Patients with LTL surgery showed selective early decreases in verbal memory. At the long-term follow-up, further decreases in verbal memory and visual memory scores were seen for all patient groups. In general, the nonmemory scores remained stable over time. LTL surgery and initial high scores were predictors of verbal memory decreases seen at the early follow-up. Late memory declines were predicted by higher 1-year scores. LTL surgery was an additional predictor of late decline on a verbal memory task, sensitive to the integrity of the left hippocampus. Higher quality-of-life scores of patients at the long-term follow-up were associated with both better seizure control and a higher everyday verbal memory skill: prose recall.

CONCLUSIONS: Surgery-induced verbal memory deficits after LTL surgery continue 13 years after surgery. Late, possibly age-related declines in multiple memory scores are seen in patients with temporal lobe surgery and nonsurgical patients with epilepsy. Patients with LTL surgery may be at risk for a more rapid decline in selective verbal memory skills. Evaluations of treatments for intractable epilepsy that compromise memory functions

should consider the further quality-of-life impact of late age-related memory declines.

COMMENTARY

Aging is anything but a neuroprotective process. Whereas research has brought increased appreciation of the neurobiologic and cognitive changes associated with normal aging, the ways in which chronic neurologic disorders, including epilepsy, influence the course of cognitive aging remains less well characterized. The aging process within a unique population, such as individuals who have undergone unilateral anterior temporal lobectomy (ATL), is of particular interest and some concern. A significant number of individuals have now undergone partial or total hippocampectomy, on average, in their early to mid 30s. These patients have been followed up very closely in immediate postoperative periods, but little is known about their long-term cognitive outcomes.

The report by Rausch et al. is one of the few studies to examine long-term cognitive outcomes after ATL. A couple of facets of the research are notable. First, although the subjects are followed up approximately 13 years after their surgery, they are still relatively young (mid 40s on average), with much of the aging process still ahead of them. Second, the authors indicate that the general pattern of cognition from the time of surgery is relatively stable, with the exception of memory function, which appears to continue to worsen over time—especially verbal memory in left ATL patients.

As often is true of important studies, this one leaves some critical issues to be addressed. For instance, the control group (i.e., patients with epilepsy who have not undergone resection) is extremely small, and no matched healthy controls exist with whom to compare long-term trajectories in memory function directly to determine whether this pattern truly deviates from the norm. Moreover, the mechanism of effect remains to be clarified. Most significantly, the findings suggest the importance of understanding better the cognitive aging process in patients who have undergone ATL, determining in what manner their course differs from that of temporal lobe epilepsy patients who have not undergone surgery, and clarifying how both may differ from healthy controls.

by Bruce Hermann, Ph.D.