

Language and Visual-Spatial Function Following Hemispherectomy

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Objective

Brain plasticity is integral to the developing brain, though it is often confined conceptually as a catalyst of restitution after damage. Studying individuals with a history of hemispherectomy for intractable epilepsy provides an opportunity to better understand functional plasticity. There is continued debate regarding the primacy of language vs. visual-spatial abilities in the preserved hemisphere. Consistent with laterality studies, we hypothesized that verbal skills would be better for right- vs. left-hemispherectomy patients and vice versa.

Participants and Methods

Data for 35 subjects participating in the UCLA Pediatric Epilepsy Surgery Program were analyzed. All surgeries (25 = left, 10 = right) occurred before the age of 14 (mean = 5.5 years). The cohort consisted of 22 females and 13 males ages 4 to 29 years. The vocabulary subtest from the Wechsler scales was used as a correlate of for language skills and the Test of Visuospatial Skills-Revised (TVPS-R) served as a correlate of motor-free visual-spatial skills.

Results

Results of analysis of variance revealed that verbal skills were comparable in individuals for whom the left- and right- hemispheres were removed or disconnected at an early age. Similarly, visuospatial skills were not significantly different by side of resection.

Conclusions

The fact that verbal and visuospatial skills were comparable both within and between right- and left-hemispherectomy groups was surprising, yet previous literature is mixed. These results are consistent with a functional plasticity model; however, the precise mechanism of this plasticity could not be uncovered. While our sample was relatively small, it represents one of the larger studies of long-term cognitive functioning following hemispherectomy.

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