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Disparity of primary and secondary language outcomes in bilingual patients undergoing resection of glioma of the speech-related regions

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Abstract

Background: The existing data about language recovery in bilingual patients comes from few studies on acute lesional deficits like stroke or traumatic injury. Still, little is known about the neuroplasticity potential of bilingual patients who undergo resection of gliomas affecting language-eloquent brain regions. In this study, we prospectively evaluated the pre- and post-operative language functions among bilinguals with eloquent region gliomas.

Methods: We have prospectively collected the preoperative, 3-month and 6-month postoperative data from patients with tumors infiltrating the dominant hemisphere language areas during a 15-month period. Validated Persian/Turkish version of western aphasia battery test (WAB) and Addenbrooke's Cognitive Examination (ACE) were assessed for main (L1) and second acquired (L2) languages in each visit.

Results: Twenty-two right-handed bilingual patients were enrolled, and language proficiencies were assessed using mixed model analysis. On baseline and postoperative points, L1 had higher scores in all ACE and WAB subdomains than L2. Both languages had deterioration at 3-month visit, however L2 was significantly more deteriorated in all domains. At 6-months visit, both L1 and L2 showed recovery, however L2 recovered to a less extent than L1. The single most parameter affecting the ultimate language outcome in this study was the preoperative functional level of L1.

Conclusion: This study shows L1 is less vulnerable to operative insults and L2 may be damaged even when L1 is preserved. We would suggest the more sensitive L2 be used as the screening tool and L1 be used for confirmation of positive responses during language mapping.

Keywords: Aphasia; bilingual; glioma; language; speech.

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