Left hemisphere

The left hemisphere is generally considered to harbor language functions. Atypical cortical language lateralization is mainly demonstrated in left hander and ambidextrous individuals, whereas dissociated language functions have been reported in association with brain injuries as a part of the reorganization process.

Unlike stroke, neurosurgical removal of left-hemisphere gliomas acts upon a reorganized language network and involves brain areas rarely damaged by stroke. Zyryanov et al. addressed whether this causes the profiles of neurosurgery- and stroke-induced language disorders to be distinct. K-means clustering of language assessment data (neurosurgery cohort: N = 88, stroke cohort: N = 95) identified similar profiles in both cohorts. But critically, a cluster of individuals with specific phonological deficits was only evident in the stroke but not in the neurosurgery cohort. Thus, phonological deficits are less clearly distinguished from other language deficits after glioma surgery compared to stroke. Furthermore, the correlations between language production and comprehension scores at different linguistic levels were more extensive in the neurosurgery than in the stroke cohort. The findings suggest that neurosurgery-induced language disorders do not correspond to those caused by stroke, but rather manifest as a 'moderate global aphasia' - a generalized decline of language processing abilities [1].

1)
Zyryanov A, Stupina E, Gordeyeva E, Buivolova O, Novozhilova E, Akinina Y, Bronov O, Gronskaya N, Gunenko G, Iskra E, Ivanova E, Kalinovskiy A, Kliuev E, Kopachev D, Kremneva E, Kryuchkova O, Medyanik I, Pedyash N, Pozdniakova V, Pronin I, Rainich K, Reutov A, Samoukina A, Shlyakhova A, Sitnikov A, Soloukhina O, Yashin K, Zelenkova V, Zuev A, Ivanova MV, Dragoy O. 'Moderate global aphasia': A generalized decline of language processing caused by glioma surgery but not stroke. Brain Lang. 2021 Dec 6;224:105057. doi: 10.1016/j.bandl.2021.105057. Epub ahead of print. PMID: 34883333.