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## Functional and oncological outcomes after right hemisphere glioma resection in awake versus asleep patients: a systematic review and meta-analysis

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## Abstract

The right hemisphere has been underestimated by being considered as the non-dominant hemisphere. However, it is involved in many functions, including movement, language, cognition, and emotion. Therefore, because lesions on this side are usually not resected under awake mapping, there is a risk of unfavorable neurological outcomes. The goal of this study is to compare the functional and oncological outcomes of awake surgery (AwS) versus surgery under general anesthesia (GA) in supratentorial right-sided gliomas. A systematic review of the literature according to PRISMA guidelines was performed up to March 2023. Four databases were screened. Primary outcome to assess was return to work (RTW). Secondary outcomes included the rate of postoperative neurological deficit, postoperative Karnofsky Performance Status (KPS) score and the extent of resection (EOR). A total of 32 articles were included with 543 patients who underwent right hemisphere tumor resection under awake surgery and 294 under general anesthesia. There were no significant differences between groups regarding age, gender, handedness, perioperative KPS, tumor location or preoperative seizures. Preoperative and long-term postoperative neurological deficits were statistically lower after AwS (p = 0.03 and p < 0.01, respectively), even though no difference was found regarding early postoperative course (p = 0.32). A subsequent analysis regarding type of postoperative impairment was performed. Severe postoperative language deficits were not different (p = 0.74), but there were fewer long-term mild motor and high-order cognitive deficits (p < 0.05) in AwS group. A higher rate of RTW (p < 0.05) was documented after AwS. The EOR was similar in both groups. Glioma resection of the right hemisphere under awake mapping is a safer procedure with a better preservation of high-order cognitive functions and a higher rate of RTW than resection under general anesthesia, despite similar EOR.

**Keywords:** Awake Surgery; General Anesthesia; Glioma; Outcomes; Return to Work; Right Hemisphere.

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