Cognitive functioning early after surgery of gliomas in eloquent areas.

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Abstract
Object Patients with gliomas frequently have cognitive deficits, and surgery can exacerbate these deficits. Preoperative assessment is therefore crucial in patients undergoing surgery for glioma in eloquent areas, because the proximity of functional areas increases the risk of permanent postoperative cognitive disturbances. Although pre- and postoperative language and motor function in patients with glioma have been investigated frequently, data on good cognition studies are scarce. Most studies have focused on clinical neurological functioning or have only used brief neurological instruments. The authors investigated whether surgery for glioma in eloquent areas influences cognition early after surgery, by using an elaborate test protocol. Methods Twenty-eight patients with gliomas of the left hemisphere in language and nonlanguage areas were assessed before and 3 months after surgery with a comprehensive neuropsychological test protocol. The authors performed a correlation analysis between change in cognitive performance and tumor characteristics (that is, location, volume, pathological features, and histological grade) and between cognitive change and treatment-related factors (the extent of the resection and postoperative treatment with chemo- and radiotherapy). Results Both pre- and postoperatively, the mean performance of the patients was worse than the performance of the normal population in the language domain, the memory domain, and the executive functions (p < 0.05). Postoperatively, a decline was found in the language domain (t = 2.34, p = 0.027) and in the executive functions (t = 2.45, p = 0.022). However, cognitive change postsurgery was influenced by the location of the tumor; the decrease of cognitive score in the language domain was only observed in patients with tumors in or close to language areas (t = 2.33, p = 0.029). No effect on cognitive change was found for the other tumor characteristics and treatment-related factors. Conclusions This study underlines the importance of the use of a neuropsychological test protocol before and after surgery in patients with glioma, because several tasks in the domains of language, memory, and executive functions appeared to deteriorate after surgery. Tumor resection in language areas increases the risk of cognitive deficits in the language domain postoperatively.

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