Postoperative ischemic changes following resection of newly diagnosed and recurrent gliomas and their clinical relevance.

Abstract:

The aim of surgical treatment of glioma is the complete resection of tumor tissue with preservation of neurological function. Inclusion of diffusion-weighted imaging (DWI) in the postoperative MRI protocol could improve the delineation of ischemia-associated postoperative neurological deficits. The present study aims to assess the incidence of infarctions following resection of newly diagnosed gliomas in comparison with recurrent gliomas and the influence on neurological function. Patients who underwent glioma resection for newly diagnosed or recurrent gliomas had early postoperative MRI, including DWI and apparent diffusion coefficient (ADC) maps. Postoperative areas of restricted diffusion were classified as arterial territorial infarctions, terminal branch infarctions, or venous infarctions. Tumor entity, location, and neurological function were recorded. New postoperative ischemic lesions were identified in 26 (31%) of 84 patients with newly diagnosed gliomas and 20 (80%) of 25 patients with recurrent gliomas (p < 0.01). New permanent and transient neurological deficits were more frequent in patients with recurrent gliomas than in patients with newly diagnosed tumors. Patients with neurological deficits had a significantly higher rate of ischemic lesions. Postoperative infarctions occur frequently in patients with newly
diagnosed and recurrent gliomas and do have an impact on postoperative neurological function. In this patient cohort there was a higher risk for ischemic lesions and for deterioration of neurological function after resection of recurrent tumors. Radiogenic and postoperative tissue changes could contribute to the higher risk of an ischemic infarction in patients with recurrent tumors.