



A service of the [U.S. National Library of Medicine](#)
and the [National Institutes of Health](#)

Select **19240609**

1: [Neurosurgery](#). 2009 Mar;64(3):471-81; discussion 481.



Positron emission tomography-guided volumetric resection of supratentorial high-grade gliomas: a survival analysis in 66 consecutive patients.

[Pirotte BJ](#), [Levier M](#), [Goldman S](#), [Massager N](#), [Wikler D](#), [Dewitte O](#), [Bruneau M](#), [Rorive S](#), [David P](#), [Brotchi J](#).

Department of Neurosurgery, Erasme Hospital, Université Libre de Bruxelles, Brussels, Belgium.
bpirotte@ulb.ac.be

OBJECTIVE: Integrating positron emission tomographic (PET) images into the image-guided resection of high-grade gliomas (HGG) has shown that metabolic information on tumor heterogeneity and distribution are useful for planning surgery, improve tumor delineation, and provide a final target contour different from that obtained with magnetic resonance imaging (MRI) alone in about 80% of the procedures. Moreover, PET guidance helps to increase the amount of tumor removed and to target image-guided resection to anaplastic tissue areas. The present study aims to evaluate whether PET-guided volumetric resection (VR) in supratentorial HGG might add benefit to the patient's outcome. **METHODS:** PET images using [18F]fluorodeoxyglucose (n=23) and [11C]methionine (n=43) were combined with MRI scans in the planning of VR procedures performed at the initial stage in 66 consecutive patients (43 M/23 F) with supratentorial HGG according to the technique previously described. In all cases (35 anaplastic gliomas [20 astrocytomas, 10 oligoastrocytomas, 5 oligodendrogliomas] and 31 glioblastomas [GBM]), level and distribution of PET tracer uptake were analyzed to define a PET contour projected on MRI scans to define a final target contour for VR. Maximal tumor resection was accomplished in each case, with the intention to remove the entire abnormal metabolic area comprised in the surgical planning. Early postoperative MRI and PET assessed tumor resection. Survival analysis was performed separately in anaplastic gliomas and glioblastoma multiforme according to the presence or absence of residual tracer uptake on postoperative PET and according to the presence or absence of residual contrast enhancement on postoperative MRI. **RESULTS:** Preoperatively, metabolic information helped the surgical planning. In all procedures, PET contributed to define a final target contour different from that obtained with MRI alone. Postoperatively, 46 of 66 patients had no residual PET tracer uptake (total PET resection), 23 of 66 had no residual MRI contrast enhancement. No additional neurological morbidity due to the technique was reported. A total PET tracer uptake resection was associated with a significantly longer survival in anaplastic gliomas ($P = 0.0071$) and in glioblastoma multiforme ($P = 0.0001$), respectively. A total MRI contrast enhancement resection was not correlated with a significantly better survival, neither in anaplastic gliomas ($P = 0.6089$) nor in glioblastoma multiforme ($P = 0.6806$). **CONCLUSIONS:** Complete resection of the increased PET tracer uptake prolongs the survival of HGG patients. Because PET information represents a more specific marker than MRI enhancement for detecting anaplastic tumor tissue, PET-guidance increases the amount of anaplastic tissue removed in HGG.

PMID: 19240609 [PubMed - in process]
