

# Fluorodeoxyglucose Positron Emission Tomography in the Prediction of Brain Tumor Treatment Response to Gamma Knife Surgery

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## Abstract

**Purpose:** To evaluate whether post-treatment fluorodeoxyglucose-positron emission tomography can predict the response to gamma knife surgery (GKS) for patients with gliomas.

**Method:** Eighteen patients with histologically confirmed gliomas treated by GKS and followed for more than 24 months were recruited. All patients underwent fluorodeoxyglucose positron emission tomography 6 to 8 months after GKS. Positron emission tomographic images and MR images were fused, and tumor-to-cortex (T/C) and tumor-to-white matter (T/WM) fluorodeoxyglucose uptake ratios were measured. By estimating and comparing the change of the maximum tumor diameter measured on the contrast-enhanced MRI (the last follow-up MRI vs. the pre-GKS MRI), we could classify tumors into complete remission (CR), partial remission (PR), stable disease (SD), and progression of disease (PD). Group I had four tumors with PR and 6 tumors with SD, and Group II had 8 tumors with PD after GKS.

**Results:** Both mean T/C ratio and mean T/WM ratio of Group I patients are statistically less than those of Group II patients.

**Conclusion:** Our study suggests that, for patients with gliomas treated by GKS, the post-treatment fluorodeoxyglucose-positron emission tomography could be used to predict response to treatment.

**Key words:** F-18 fluorodeoxyglucose, gamma knife surgery, gliomas, positron emission tomography.

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