Monitoring chemotherapy and radiotherapy of solid tumors.

Abstract:
PET imaging with the glucose analog fluorodeoxyglucose (FDG-PET) has been evaluated in numerous studies to monitor tumor response in patients undergoing chemo- and radiotherapy. The clinical value of FDG-PET for differentiation of residual or recurrent viable tumor and therapy-induced fibrosis or scar tissue has been documented for various solid tumors. Furthermore, there are now several reports suggesting that quantitative assessment of therapy-induced changes in tumor FDG uptake may allow prediction of tumor response and patient outcome very early in the course of therapy. In nonresponding patients, treatment may be adjusted according to the individual chemo- and radiosensitivity of the tumor tissue. Since the number of alternative treatments for solid tumors (e.g., second-line chemotherapy agents, protein kinase, or angiogenesis inhibitors) is continuously increasing, early prediction of tumor response to chemotherapy and radiotherapy by FDG-PET has enormous potential to "personalize" treatment and to reduce the side-effects and costs of ineffective therapy.