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Metabolic imaging predicts response, survival, and recurrence in adenocarcinomas of the esophagogastric junction.

Abstract:
PURPOSE: A previous study suggested that measurement of therapy-induced changes in tumor glucose metabolism by positron emission tomography (PET) with the glucose analog \([18F]fluorodeoxyglucose (FDG) allows to select patients most likely to benefit from preoperative chemotherapy in adenocarcinomas of the esophagogastric junction (AEG). The aim of this study was to prospectively validate these findings by using an a priori definition of metabolic response.

PATIENTS AND METHODS: Sixty-five patients with locally advanced AEGs were included. Tumor glucose utilization was quantitatively assessed by FDG-PET before chemotherapy and 14 days after initiation of therapy. Patients were classified as metabolic responders when the metabolic activity of the primary tumor had decreased by more than 35% at the time of the second PET.

RESULTS: Metabolic responders showed a high histopathologic response rate (44%) with a 3-year survival rate of 70%. In contrast, prognosis was poor for metabolic nonresponders with a histopathologic response rate of 5% (\(P = .001\)) and a 3-year survival rate of 35% (\(P = .01\)). A multivariate analysis (covariates: ypT-, ypN-category, histopathologic response) demonstrated that metabolic response was the only factor predicting recurrence (\(P = .018\)) in the subgroup.
of completely resected (R0) patients. CONCLUSION: This study prospectively demonstrates that changes in tumor metabolic activity during chemotherapy predict response, prognosis, and recurrence. These data provide the basis for clinical trials in which preoperative treatment is changed for patients without a metabolic response early in the course of therapy. PET-guided induction therapy may even be applicable to earlier tumor stages because surgery is only minimally delayed in nonresponding patients.