Impact of post-therapy positron emission tomography on prognostic stratification and surveillance after chemoradiotherapy for cervical cancer

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Abstract

BACKGROUND:

A study was undertaken to investigate the detection of relapse and survival outcomes in patients with cervical cancer treated with curative intent chemoradiotherapy, and evaluated with a post-therapy ^{18}F-fluorodeoxyglucose positron emission tomography (FDG-PET) scan.

METHODS:

Between January 2002 and June 2007, 105 consecutive patients were prospectively enrolled into a registry study designed to assess outcomes of chemoradiotherapy. The radiation therapy protocol consisted of external radiation to the pelvis, a nodal boost, and a high-dose brachytherapy boost. All patients received cisplatinum chemotherapy. A FDG-PET scan was performed between 3 and 12 months (median, 4.9 months) post-treatment at clinician discretion. Tumor response was graded as complete metabolic response, partial metabolic response, or progressive metabolic disease.

RESULTS:

Median follow-up was 36 months. At post-therapy FDG-PET, 73 (70%) patients had complete metabolic response, 10 (9%) had partial metabolic response, and 22 (21%) had progressive metabolic disease. Overall survival at 3 years was 77% in all patients, and 95% for those with complete metabolic response. On multivariate analysis, complete metabolic response ($P < .0001$) and pretreatment tumor volume ($P = .041$) were strong predictors for overall survival. The number of involved lymph nodes ($P < .005$) and International Federation of Gynecology and Obstetrics stage ($P = .04$) were predictive of relapse-free survival. In total, 18 patients relapsed at a single site, and 13 underwent salvage, with a 3-year survival of 67%. Patients with complete metabolic response had a distant failure rate 36-fold less than those with partial metabolic response ($P < .0001$). After complete metabolic response, only 1 patient (1.6%) relapsed without symptoms and was detected through physical examination. Analysis of survival by FDG-PET response demonstrated that patients with a complete metabolic response had a three-year overall survival of 95% and cause-specific survival of 98%. In contrast, patients with anything less than a complete response had a three-year overall survival of 36% and cause-specific survival of 40%.

CONCLUSIONS:

The presence of a complete metabolic response at post-therapy FDG-PET is a powerful predictor for survival after chemoradiation. The very low rate of recurrence in patients with a complete metabolic response justifies a conservative follow-up approach for these patients, because relapse is usually symptomatic and not detected by routine clinical review.

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