

Case of the Quarter—April 2011

## FDG-PET/CT for Staging of Esophageal Cancer and Assessment of Response to Therapy

### Patient History

This patient is a 68-year-old woman who presented with mild dysphagia, esophageal reflux, poorly defined abdominal pain, bloating, and mild nausea. The patient has a history of COPD and has smoked cigarettes for 45 years. Endoscopic evaluation and biopsy led to a diagnosis of infiltrating squamous cell carcinoma, moderately differentiated, grade II in the proximal esophagus. An FDG-PET/CT was ordered for initial staging of the patient's esophageal cancer.

### FDG-PET/CT Findings

FDG-PET/CT (Figure 1) revealed prominent increased FDG uptake within the upper and mid esophagus consistent with the known esophageal cancer. The FDG-PET/CT scan also showed metastatic spread of disease to lymph nodes in the mediastinum, right paratracheal region, and possibly to left perihilar region. There was also increased FDG uptake associated with a pulmonary nodule in the left inferior costophrenic angle suspicious for lung metastasis (not shown).

### Follow-Up

Based on the FDG-PET/CT findings that showed extensive nodal metastasis and a neoplastic-appearing pulmonary nodule, the oncologist determined that the patient was "not a candidate for surgical resection with curative intent." The patient then underwent chemotherapy

and a six-week course of radiation therapy. During this treatment, the patient's swallowing obstruction resolved almost completely.

A restaging FDG-PET/CT study was ordered to assess response to therapy. The FDG-PET/CT scan (Figure 2) showed a marked decrease in metabolic activity involving the proximal and mid third of the esophagus, with some residual, mild area of increased metabolic activity. There was also marked interval reduction of adenopathy within the mediastinum and interval decrease in metabolic activity in the left lower lobe pulmonary nodule.

### How Did FDG-PET/CT Help?

In the present case, FDG-PET/CT was valuable in the initial staging of disease and evaluation of the extent of metastatic spread, and in determining that the patient was not a candidate for surgical resection. Following radiation treatment, a restaging FDG-PET/CT indicated an excellent response to therapy.

### Discussion

In an article reviewing the role of FDG-PET/CT in staging of esophageal cancer and evaluating response to therapy, Munden et al note that, "Positron emission tomography with F18 fluoro-2-deoxy-D-glucose and integrated CT-PET are useful in the initial staging of patients with esophageal cancer and in the prediction of pathologic response, disease-free-interval, and overall survival



Figure 1. FDG-PET, October 2010



Figure 1. FDG-PET/CT, October 2010



Figure 2. FDG-PET, January 2011



Figure 2. FDG-PET/CT, January 2011

after preoperative therapy. Importantly, integrated CT-PET imaging decreases the number of futile attempts at surgical resection, mainly because of the detection of occult distant metastases."

Munden, Reginald F., M.D., D.M.D.; Macapinlac, Homer A., M.D.; Erasmus, Jeremy J., M.D., "Esophageal Cancer: The Role of Integrated CT-PET in Initial Staging and Response Assessment After Preoperative Therapy." *Journal of Thoracic Imaging*, May 2006, Volume 21, Issue 2, pp 137-145.

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