

Case of the Quarter—June 2010

Role of PET/CT in the Localization and Staging of Head and Neck Squamous Cell Cancer

Patient History

The patient is a 43-year-old woman who presented with a right neck mass in April 2009. A CT exam showed right cervical lymphadenopathy, and fine needle aspiration biopsy showed metastatic squamous cell carcinoma.

PET Findings

An FDG-PET/CT was ordered to localize the primary tumor and was performed in April 2009. The PET/CT showed high uptake in the right pharyngeal tonsil, which was thought to be the primary tumor. Metastatic lymph nodes in the right anterior cervical node chain were present, but there was no evidence of distant metastatic disease (Figure 1).

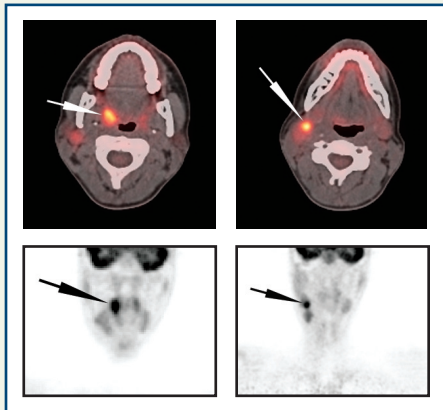


Figure 1. PET/CT—April 2009. Pharyngeal tonsil uptake (left images) and cervical node uptake (right images)

Based on imaging findings, including PET/CT, the patient was staged as T1N2bM0 Stage IVa of the right tonsillar base. The patient underwent tonsillectomy and successfully completed

concurrent chemotherapy and radiation therapy.

A follow-up PET/CT was performed in October 2009 to evaluate the patient's progress. The whole-body PET/CT showed diminished FDG avidity in the right pharyngeal region and right cervical lymph nodes compared with prior PET/CT scan, suggesting response to treatment with no residual disease (Figure 2).

Follow-up examinations in oncology clinic indicate

that the patient shows good response to treatment and is doing well, with no clinical evidence of recurrence.

How Did PET/CT Help?

FDG-PET/CT played an important role in this case in a number of ways: in localizing the primary tumor and in staging the patient's disease; in evaluating response to therapy; and, in determining that there did not appear to be recurrence or spread of disease beyond the neck region.

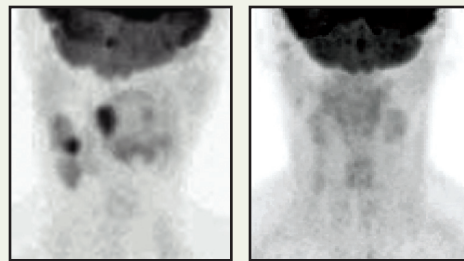


Figure 2. April 2009 (left) and October 2009 (right) — PET/CT before and after treatment.

Discussion

In a multicenter prospective study of 233 patients with newly diagnosed and untreated head and

neck squamous cell cancer (HNSCC), Lonneux et al¹ compared TNM stage and therapeutic decision based on: 1. conventional workup (physical exam, CT/MRI of head and neck, and thoracic CT) and 2. PET/CT. The authors found that adding whole-body FDG-PET/CT to pre-therapeutic conventional staging of HNSCC improved TNM classification of disease and altered the therapeutic plan and management of 32 of the 233 patients, representing 13.7% of the total. These findings support use of FDG-PET/CT in the routine work-up of HNSCC.

1. Lonneux, Max et al, "Positron Emission Tomography With [¹⁸F] Fluorodeoxyglucose Improves Staging and Patient Management With Patients With Head and Neck Squamous Cell Carcinoma: A Multicenter Prospective Study." *Journal of Clinical Oncology*. Feb. 1, 2010.

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