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FIRST ISSUE OF OUR NEW FORMAT!

PET/CT CANCER

PET/CT Accurately Assesses Treatment Response in Cervical Cancer

In a recent study published in the *Journal of the American Medical Association*, the authors prospectively evaluated 92 women with cervical cancer after they underwent radiation treatment and chemotherapy. Approximately three months after completing treatment, each patient had a whole-body FDG-PET/CT. In most of the patients, PET showed a complete response; the three-year progression-free survival rate for this group was 78%. Those whose PET results showed a “partial metabolic response” had a three-year survival of 33%, while none of those whose PETs showed “progressive disease” had a progression-free survival. **Conclusion: PET/CT is an accurate predictor of survival after therapy for cervical cancer, with higher predictive value than pre-treatment lymph node status.**¹

PET/CT OVERVIEW

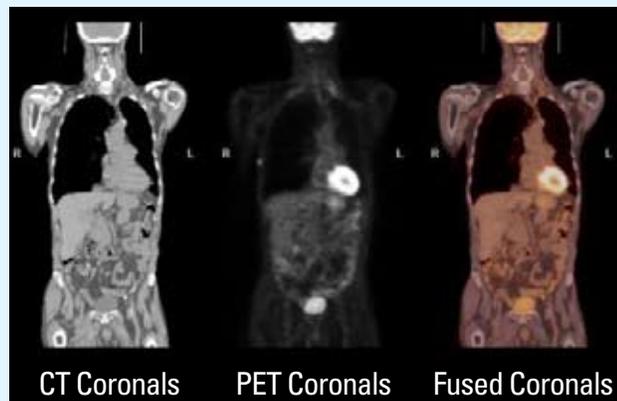
What Is PET/CT?

A PET scan refers to positron emission tomography. It is a type of nuclear medicine scan, similar to other NM studies in which a radioactive pharmaceutical agent (called a radiopharmaceutical) is injected into a patient's body. After the radiopharmaceutical localizes to certain areas of the body, the radiation it emits is measured. A PET scan is slightly different from most NM studies in the type of radiation emitted. Although the gamma camera that is normally used for NM may be used for PET, a dedicated PET scanner is usually needed for a high-quality study.

The radiopharmaceutical used most often for PET is F18-FDG (fluorodeoxyglucose). In simpler terms, this is basically radioactive sugar. Because the body requires sugar to perform any metabolic function, the F18-FDG will localize to any areas in the body that are the most metabolically active and growing. These include most tumors, such as lymphoma, along with any areas of infection or inflammation.

PET can be extremely useful in staging a cancer, because it offers a way to image the entire body so the radiologist can see all the highly active areas at once. The images in PET are called “tomographic” because, like those produced by CT and MRI scans, they can be seen in any plane (axial, coronal, or sagittal), as well as whole-body planar images. (For more in-depth explanations of these terms, please see our [Radiology 101](#) newsletter series, available on the ProScan Imaging website).

One drawback of a PET scan, however, is that its level of anatomic detail is very limited. By combining PET and CT, a radiologist can see specific anatomy in areas of high PET uptake.



This is done by performing a CT scan at the same time as the PET scan, with the patient in the same position. The areas of high uptake on PET can then be specifically pinpointed on the corresponding CT image to identify the type of tissue that has the high activity.



MR Angiography Detects Early Changes in Blood Vessels in Treatment of Brain Metastases

Researchers from the University of North Carolina performed MR angiograms on 22 women with brain metastases from breast cancer; imaging was done both before and two months after the start of lapatanib therapy. The number, size, and tortuosity of the blood vessels (angiogenesis) were measured on the MRIs and compared to those of normal controls, and also compared before and after treatment. All the patients with brain metastases demonstrated more tortuous blood vessels than the controls. Of the 22 women studied, 19 did not show any improvement in vessel tortuosity two months after treatment; all 19 of these women demonstrated tumor growth at four-month follow-up. In contrast, three of the subjects showed a quantitative decrease in vessel tortuosity two months after treatment began. Two of these patients were followed and responded to treatment for at least six months. **Conclusions: MR angiography may indicate the early response of brain metastases to treatment.**²

SOURCES

1. Schwarz J.K., Siegel B.A., Dehdashti F., *et al.* "Association of Post-Therapy Positron Emission Tomography with Tumor Response and Survival in Cervical Carcinoma." *JAMA* 2007; 298:2289-2295.
2. Bullitt E., Lin N.U., Smith J.K., *et al.* "Blood Vessel Morphologic Changes Depicted with MR Angiography during Treatment of Brain Metastases: A Feasibility Study." *Radiology* 2007; 245: 824-830.

NEXT ISSUE: MORE NEWS AND TRENDS IN CLINICAL TRIAL IMAGING



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