

More accurate staging of cervical cancer in PET imaging

Accurate staging and detection of metastases in cervical cancer can help avoid unnecessary surgery and improve radiation treatment planning.

Tumor staging by positron emission tomography/computerized tomography (PET/CT) can significantly improve treatment decisions and the accuracy of highly precise radiotherapy.¹

- **Accurate definition of radiotherapy** volumes, spares active bone marrow from high doses of radiation, to help deliver more precise brachytherapy.¹

- **Accurate evaluation of nodal status** to verify delineation of metastatic lymph nodes in the pelvis or para-aortic area can lead to planning of an intensity-modulated radiation therapy (IMRT), an integrated boost with dose escalation within the involved area.^{1,2}

Results of PET/CT can change treatment planning volumes in up to 30% of patients in advanced stage disease.³

“In many patients with cervical cancer, surgery for lymph node sampling in the pelvis and para-aortic regions has now been replaced by whole-body PET, which provides a noninvasive means of whole-body lymph node assessment.”⁴

PET/CT leads to more accurate staging of cervical cancer in detection of pelvic lymph node involvement

	PET/CT	MRI	CT
Sensitivity	79% ⁵	72% ⁵	47% ⁵
Specificity	99% ⁵	96% ⁵	50% ⁵

American College of Radiology (ACR) Appropriateness Criteria; Pretreatment Planning-Invasive Cancer of the Cervix

“PET is as good as or better than other modalities in assessing nodal, extra-pelvic and bone metastasis and is also helpful in predicting patient outcome when SUV_{max} is incorporated into the assessment.”⁶

Medicare recognizes the utility of PET and PET/CT in cervical cancer.⁷

Initial Treatment Strategy (formerly Diagnosis and Staging)

PET is covered for initial staging of biopsy proven cervical cancer. PET is non-covered for diagnosis of cervical cancer.

expected that conventional study information is insufficient for the clinical management of the patient

Subsequent Treatment Strategy (Restaging)

PET is covered for restaging:

- After completion of treatment for the purpose of detecting residual disease; or
- For detecting suspected recurrence or metastasis; or
- To determine the extent of a known recurrence; or
- If it could potentially replace one or more conventional imaging studies when it is

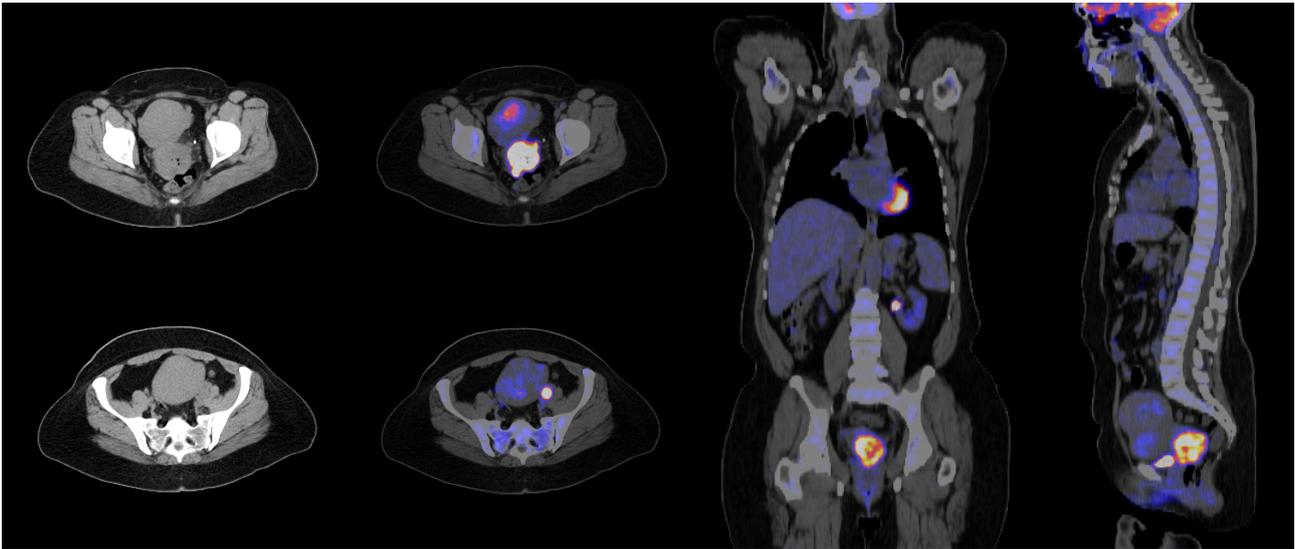
Restaging applies to testing after a course of treatment is completed and is covered subject to the conditions above.

Monitoring response to therapy

PET is covered for monitoring tumor response to treatment during the planned course of therapy (ie, when a change in therapy is being considered).

The ordering physician is responsible for documenting the medical necessity of the PET scan and that it meets these criteria.

PET reveals extent of metastases in patient with cervical cancer



Data courtesy of University of Tennessee Medical Center, Knoxville, Tennessee, USA

History

A 46-year-old female had significant vaginal bleeding that led to anemia. Her last pap smear was approximately 10 years ago. The patient has a family history of cancer with mother having ovarian cancer.

Pelvic examination revealed a large pedunculated fixed mass encroaching into the vagina anteriorly as well as posteriorly which was consistent with cervical cancer stage IIA. Biopsies were obtained from the tumor transvaginally.

The CT showed remarkably enlarged uterus with heterogenous 6 x 5 cm and 7 x 6 cm cervical lesions. No evidence of free fluid or adenopathy.

Pathology

Pathology revealed invasive poorly differentiated carcinoma. PET/CT scan obtained to rule out distant disease.

Imaging findings

PET/CT ordered for initial treatment strategy (ITS) revealed intensely hypermetabolic irregular 6.5 cm soft tissue thickening associated with cervix.

PET/CT also revealed hyper-metabolic metastatic left iliac chain lymphadenopathy measuring up to 14 x 16 mm.

Findings were consistent with metastatic cervical carcinoma with lymph node metastases in the left iliac nodal group. No evidence of distant metastatic disease outside the pelvis.

Treatment

High-dose rate (HDR) brachytherapy

Overall evaluation

PET/CT can be utilized for initial staging in biopsy proven cervical cancer and restaging of patients with cervical cancer. PET is particularly sensitive for detecting distant metastases, which can significantly influence management of these patients.

¹ Herrera FG, et al. The role of PET/CT in cervical cancer. *Front Oncol.* 2013; Feb 26;3:34.

² Kidd EA, et al. Clinical outcomes of definitive intensity-modulated radiation therapy with fluorodeoxyglucose-positron emission tomography simulation in patients with locally advanced cervical cancer. *Int J Radiat Oncol Biol Phys.* 2010; Jul 15;77(4):1085-91.

³ Brunetti. PET/CT in gynecologic malignancies. *J. Radiol Clin North Am.* 2013; Sep;51(5):895-911.

⁴ Kidd EA, et al. Lymph node staging by positron emission tomography in cervical cancer: relationship to prognosis. *J Clin Oncol.* 2010; Apr 20;28(12):2108-13.

⁵ Viswanathan C, et al. Positron emission tomography-computed tomography imaging for malignancies in women. *Radiol Clin North Am.* 2013 Nov;51(6):1111-25.

⁶ ACR Appropriateness Criteria; Pretreatment Planning-Invasive Cancer of the Cervix <http://www.acr.org/~media/ACR/Documents/AppCriteria/Diagnostic/PretreatmentPlanningInvasiveCancerCervix.pdf>.

⁷ CMS Publication 100-03, Medicare National Coverage Determinations Manual, Chapter 1, Part 4, Section 220.6). Available at http://www.cms.hhs.gov/manuals/downloads/ncd103c1_part4.pdf

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Published by

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