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PET Recommendation Report 7

PET Imaging in Ovarian Cancer

M Prefontaine and C Walker-Dilks

Report Date: January 19, 2009

PET Recommendation Report 7 is comprised of 2 sections and is available on the CCO Web site (https://www.cancercare.on.ca)
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Section 1: Recommendations
Section 2: Evidentiary Base

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Recommendation Report – PET #7: Section 1

PET Imaging in Ovarian Cancer: Recommendations

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QUESTIONS

- What benefit to clinical management does positron emission tomography (PET) or positron emission tomography/computed tomography (PET/CT) contribute to the diagnosis or staging of ovarian cancer?
- What benefit to clinical management does PET or PET/CT contribute to the assessment of treatment response for ovarian cancer?
- What benefit to clinical management does PET or PET/CT contribute when recurrence of ovarian cancer is suspected but not proven?
- What benefit to clinical management does PET or PET/CT contribute to restaging at the time of documented recurrence for ovarian cancer?
- What is the role of PET when a solitary metastasis is identified at the time of recurrence and a metastectomy is being contemplated?

TARGET POPULATION

Patients with ovarian cancer.

INTENDED PURPOSE

- This recommendation report is primarily intended to guide the Ontario PET Steering Committee in their decision making concerning indications for the use of PET imaging.
- This recommendation report may also be useful in informing clinical decision making regarding the appropriate role of PET imaging and in guiding priorities for future PET imaging research.

RECOMMENDATIONS AND KEY EVIDENCE

These recommendations are based on an evidentiary foundation consisting of one recent high-quality systematic review from the U.S. Agency for Health Research and Quality (AHRQ) (1) that included primary study literature for the period from 2003 to March 2008.

Diagnosis/Staging

PET is not recommended in the diagnosis of ovarian cancer.
A recommendation cannot be made for or against the use of PET in the evaluation of asymptomatic ovarian mass due to insufficient evidence.
Three studies evaluated the diagnostic performance of fluorodeoxyglucose (FDG) PET or FDG-PET/CT in women presenting with a pelvic mass, most of whom had an elevated CA-125. In one study of 97 patients, PET/CT had a sensitivity of 100% and a specificity of 92% (Risum et al [2]). Castellucci et al (3) compared PET/CT with ultrasound (U/S) in 50 patients and showed sensitivities of 87% and 90%, respectively, and specificities of 100% and 61%, respectively. Kawahara et al (4) compared magnetic resonance imaging (MRI), PET and combined reading of MRI/PET and showed sensitivities of 91%, 78%, and 91%, respectively, and specificity of 87% for all three modalities. The ultimate diagnosis of complex ovarian masses rests on histopathology. Laparotomy, image guided biopsy, or cytology of ascites fluid cannot be safely omitted in patients with complex ovarian masses. PET imaging does not add significantly to the diagnostic evaluation of pelvic masses.

Qualifying Statement

- The Gynecology DSG feels the role of PET in asymptomatic mass should be the subject of further study. PET is not useful in symptomatic mass.

PET is not recommended for staging of ovarian cancer.
Four studies evaluated the staging performance of FDG PET or FDG PET/CT compared with conventional imaging modalities. Sixteen of 27 patients with surgical stage IIIC were upstaged to stage IV by PET/CT (Risum et al [2]). PET/CT correlated with surgical stage in 69% of cases, compared with 53% for CT (Castellucci et al [3]). PET correlated with surgical staging in 87% of cases, compared with 53% for CT (Yoshida et al [5]). In a study of 13 patients (Drieskens et al [6]), PET and CT results were concordant in 54/73 regions; 47 were correctly interpreted by both methods.

Qualifying Statement

- The staging of ovarian cancer is based on surgicopathological findings at laparotomy. Patients with occult extraperitoneal metastases seen on PET may also benefit from cytoreductive surgery. Stage migration based on PET should not affect adjuvant therapy and likely will not affect outcome.

Recurrence/Restaging

PET is not recommended for detecting recurrence or restaging patients not being considered for surgery.
A recommendation cannot be made for or against the use of PET for patients being considered for secondary cytoreduction due to insufficient evidence.
Several retrospective studies (Bristow et al [7], Garcia-Vellos et al [8], Kim et al [9], Pannu et al [10], Sebastian et al [11], Thrall et al [12]) and prospective studies (Bristow et al [13], Chung et al [14], Grisaru et al [15], Hauth et al [16], Murakami et al [17], Nanni et al [18], Picchio et al [19], Takehuma et al [20]) have correlated the findings of FDG-PET or FDG-PET/CT with histology or clinical follow-up. Most individual studies and pooled data showed statistically significant positive and negative likelihood ratios (LR) for identifying recurrent disease. Positive LR ranged from four to 22, with 95% CI crossing 1.0 for only one pooled set

of data (PET/CT versus histology/biopsy two retrospective studies [Bristow et al [7], Pannu et al [10]). Negative LR ranged from 0.10 to 0.36, with none of the 95% CIs crossing 1.0.

Qualifying Statements

- PET is relatively accurate in identifying recurrent ovarian cancer. The clinical impact on treatment decision making will vary depending on treatment philosophy. With a rising CA125, PET will confirm recurrent disease in many women with a normal physical examination and CT scan. Most clinicians do not recommend restarting chemotherapy with a rising marker and negative imaging. In the absence of data to support that restarting chemotherapy for a PET-only confirmation of recurrence improves survival or quality of life, the findings on PET may be of questionable benefit. Similarly, resuming treatment for a positive PET with a normal CA-125 has not been evaluated.
- There is no evidence to support PET for assessing suspected or diagnosed recurrence where surgery is not an option for treatment.
- PET may be useful in a subset of patients with recurrent ovarian cancer who appear to have an isolated mass on CT and are considered candidates for secondary cytoreductive surgery. The presence of multifocal disease on PET, which is more frequent, may change management away from surgery. Isolated disease on PET, which is less common, may support the recommendation for secondary debulking.

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