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PET Recommendation Report 8

PET Imaging in Testicular Cancer

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Report Date: January 19, 2009

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Section 1: Recommendations
Section 2: Evidentiary Base

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Recommendation Report – PET #8: Section 1

PET Imaging in Testicular 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 testicular cancer?
- What benefit to clinical management does PET or PET/CT contribute to the assessment of treatment response for testicular cancer?
- What benefit to clinical management does PET or PET/CT contribute when recurrence of testicular 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 testicular 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 testicular 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

A recommendation cannot be made for or against the use of PET in the routine staging of patients with testicular cancer due to insufficient evidence.

Lassen et al (2) studied 46 patients with stage I nonseminomatous germ cell tumour (NSCGT). PET identified seven of 10 patients with relapse at the time of initial staging (sensitivity 70%) and had no false positive results (specificity 100%).
A U.K. study by Huddart et al (3) was excluded from the AHRQ report because it did not address any of the questions posed by the report, but the Genitourinary Disease Site Group (GU DSG) feels the study should be noted. The objective of the trial was to examine whether PET could identify patients without occult metastatic disease. This study included 116 patients with NSGCT and evidence of vascular invasion in the primary specimen. Patients had clinical stage I disease on the basis of clinical examination, chest x-ray, and CT scan, and negative postorchidectomy tumour markers. The study was designed to exclude a negative predictive value of less than 80% and a two-year relapse-free rate of 80% or less. The study was stopped prematurely prior to full accrual as the estimated one-year relapse-free rate was 65%, and even with no further relapses in patients accrued, the best achievable two-year relapse-free rate was estimated to be 70%. Of 88 patients with negative PET scans, 33 patients relapsed with an estimated one-year relapse-free rate of 63.3%.

Qualifying Statement

None.

Assessment of Treatment Response

PET is recommended for the assessment of treatment response in patients with seminoma and residual masses after chemotherapy.
PET is not recommended for the assessment of treatment response in patients with nonseminoma.
Hinz et al (4) examined fluorodeoxyglucose (FDG)-PET for predicting visible residual tumour in 20 patients with seminoma following chemotherapy for advanced disease. PET had sensitivity of 100% and specificity of 47% in detecting residual tumour. Becherer et al (5) evaluated PET in 48 patients with metastatic seminoma and CT-documented mass after chemotherapy. PET had sensitivity and specificity of 80% and 100%, respectively, compared with CT sensitivity and specificity both 73%. Karapetis et al (6) reviewed 15 patients with advanced testicular germ cell tumour who had at least one postchemotherapy PET scan. A first PET scan had 100% sensitivity and 72% specificity. PET led to a change in management in only one patient (from observation to surgical excision of residual mass).

Qualifying statement

- In NSGCTs, PET does not reliably distinguish mature teratoma from benign residual mass, and thus resection of residual masses is required.

Recurrence/Restaging

A recommendation cannot be made for or against the routine use of PET for evaluation of recurrence due to insufficient evidence.
In Karapetis et al (6), three of the 15 patients developed relapsed germ cell tumour after chemotherapy. Initial PET scans were normal in two patients and equivocal in one. Repeat scans done at the time of clear disease relapse confirmed positive serum tumour marker. In Becherer et al (5), PET correctly identified relapse in 2 of 5 patients who had received high-dose salvage therapy.

Qualifying Statement

None.

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