

Clinical Area: FDG PET for head and neck cancer: lymph node staging
Keywords: FDG PET, lymph node, head and neck cancer
Reference: Stokkel MPM, ten Broek F-W, Hordjik G-J, Kooke R, van Rijk PP. Preoperative evaluation of patients with primary head and neck cancer using dual-head 18-fluorodeoxyglucose positron emission tomography. *Ann Surg* 2000; 231: 229-234.

Study Type: Comparison of diagnostic tests
Study Aim: To compare the performance of FDG PET and conventional imaging modalities at detecting regional lymph node metastases of head and neck cancer.

Outcomes

- *Primary:* Sensitivity, sensitivity
- *Secondary:* Detection of second primary tumor.

Design

- *Number of subjects:* N=54
- *Description of study population:* 31 men/23 women; mean age=60 years (range 34-81).
- *Inclusion and exclusion criteria:* Inclusion: Previously untreated squamous cell carcinomas of the oral cavity or oropharynx. Exclusion: history of malignancy.
- *Procedure:* Within a period of 3 weeks before surgery, patients received a clinical examination, chest x-ray, CT scan, high-resolution ultrasound and FDG-PET. All tests were analyzed visually and classified as 0 (no metastases), 1 (one metastasis) or 2 (multiple metastatic lymph nodes).

Validity

- *Independent blind comparison with a gold standard or follow-up of those not receiving the gold standard test?* Blinding was not specified. Gold standard was histopathologic findings.
- *Was "normal" defined?* Not clearly defined with standard uptake value (SUV) cutoff; PET studies were evaluated qualitatively.
- *Appropriate spectrum of disease?*
- *Consecutive patients?* Yes.
- *Methods described in enough detail to enable you to replicate the test?* Yes.
- *Reproducible results?* Yes.

Conclusions regarding validity of methods:

Strengths were that it was prospective, had a moderate sample size, included consecutive patients and compared FDG PET to conventional imaging. A limitation of this study was that blinding was not discussed; this could bias the assessment of PET sensitivity and specificity.

Results

Comparison of FDG PET and conventional imaging with histopathological findings (n=54 patients)

Method	Sensitivity %	Specificity %	PPV %	NPV %
PET	96	90	85	98
CT	85	86	79	91
Ultrasonography	82	66	62	85
Ultrasonography+ fine needle aspiration cytology	64	100	100	81

In 9/54 (17%) patients, an unknown second primary tumor was detected by FDG PET and confirmed by histologic evaluation.

Authors' Conclusions

“Because of the high prevalence of second primary tumors detected by FDG PET and the decreased error rate in the assessment of lymph node involvement compared with CT and US (ultrasound), FDG PET should be routinely performed in patients with primary head and neck cancer.”

Reviewer's Conclusions

This prospective study found that PET performed well compared to CT and ultrasound in identifying lymph node metastases in patients with head and neck cancer prior to surgery. A potential limitation of this study is that the authors did not specify whether interpretation of FDG PET and other diagnostic test results were blinded. If not, it is difficult to compare the sensitivity and specificity of diagnostic tests. The study did not provide information on changes in patient management due to FDG PET findings.