

**Clinical Area:** FDG PET for head and neck cancer: lymph node staging  
**Keywords:** FDG PET, lymph node, head and neck cancer, conventional imaging modalities  
**Reference:** Adams S, Baum RP, Stuckensen T, Bitter K, Hor G. Prospective comparison of 18F-FDG PET with conventional imaging modalities (CT, MRI, US) in lymph node staging of head and neck cancer. *Eur J Nucl Med* 1998; 25: 1255-1260.

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

### Outcomes

- *Primary:* Sensitivity, sensitivity

### Design

- *Number of subjects:* N=60
- *Description of study population:* 16 female/44 male; mean age=58 ± 10 years (range 38-76 years).
- *Inclusion and exclusion criteria:* Inclusion: Histologically proven squamous cell carcinoma of the head and neck, scheduled for surgery. Exclusion: Not stated.
- *Procedure:* FDG-whole body PET. Patients received physical examinations by the head and neck surgeon and preoperative endoscopy (including biopsy) within two weeks before the PET scan. Also preceding the PET scan, patients had CT scans, MRIs and high resolution ultrasounds.

### Validity

- *Independent blind comparison with a gold standard or follow-up of those not receiving the gold standard test?* Yes, independent blind comparison. Gold standard was histopathological evidence.
- *Was “normal” defined?* Yes, defined as level of standard uptake values (SUV). Lesions with SUV > 2.0 were considered malignant.
- *Appropriate spectrum of disease?* Yes.
- *Consecutive patients?* Not specified.
- *Methods described in enough detail to enable you to replicate the test?* Yes.
- *Reproducible results?* Yes.

### Conclusions regarding validity of methods:

Reasonably well-done study with a moderate sample size. Patients may not have been consecutive which could introduce selection bias.

## Results

### Comparison of FDG PET and conventional imaging with histopathological findings (n=60 patients)

Method	Sensitivity %	Specificity %	PPV %	NPV %
PET	90	94	58	99
CT	82	85	35	98
MRI	80	79	27	98
Sonography	72	70	19	70

PPV=positive predictive value; NPV=negative predictive value

### Total number of resected lymph nodes in comparison with histopathological findings (n=1284 nodes)

Method	True- Positive	False- negative	False- positive	True- negative
PET	105	12	75	1092
CT	96	21	175	992
MRI	94	23	250	917
Sonography	84	33	350	817

### **Authors' Conclusions**

“In conclusion, this prospective histologically controlled study confirms FDG PET as the procedure with the highest sensitivity and specificity for detecting lymph node metastases of head and neck cancer.”

### **Reviewer's Conclusions**

This relatively valid study found that FDG PET performed well compared to conventional imaging modalities in correctly identifying lymph node metastases in patients with head and neck cancer prior to surgery. Sensitivity, specificity and positive predictive value were higher than for MRI, ultrasonography and CT scans. The study did not provide information on changes in patient management due to FDG PET findings.