



## **<sup>18</sup>F Fluorodeoxyglucose PET/CT in Head and Neck Squamous Cell Carcinoma with Negative Neck Palpation Findings: A Prospective Study**

Jong-Lyel Roh, MD, et al, *Radiology*, Apr 2014, Vol. 271, No. 1:153–161.

### **Purpose**

To assess the clinical usefulness of fluorine 18 (<sup>18</sup>F) fluorodeoxyglucose (FDG) positron emission tomography (PET)/computed tomography (CT) and CT/magnetic resonance (MR) imaging in detecting occult neck metastasis in patients with head and neck squamous cell carcinoma and negative neck palpation findings.

### **Materials and Methods**

This prospective study was approved by the institutional review board, and written informed consent was obtained from all enrolled patients. In total, 91 patients with head and neck squamous cell carcinoma and negative neck palpation findings were assessed prospectively with <sup>18</sup>F-FDG PET/CT and CT/MR imaging. Histopathologic analysis of neck dissection samples served as the standard of reference. Diagnostic values of <sup>18</sup>F-FDG PET/CT and CT/MR imaging were compared by using the McNemar test and logistic regression with generalized estimating equations.

### **Results**

Of 91 patients, 38 (42%) had metastasis in 43 neck sides and 70 levels of the neck. <sup>18</sup>F-FDG PET/CT demonstrated nodal metastasis more sensitively on a per-level basis than did CT/MR imaging (69% vs 39%,  $P < .001$ ). CT/MR imaging demonstrated nodal metastasis with low sensitivity at all levels (0%–38%) except level II (55%), while <sup>18</sup>F-FDG PET/CT had generally high sensitivity at all levels (63%–100%) except level VI (0%). On a per-patient basis, the sensitivities of <sup>18</sup>F-FDG PET/CT and CT/MR imaging were 71% and 50%, respectively ( $P = .011$ ). <sup>18</sup>F-FDG PET/CT accurately depicted CT/MR imaging false-negative findings in nine of 19 patients but yielded false-negative results in 11 patients. Use of <sup>18</sup>F-FDG PET/CT reduced the probability of occult neck metastasis to 12%.

### **Conclusion**

<sup>18</sup>F-FDG PET/CT is superior to CT/MR imaging in depicting occult cervical metastatic nodes in patients with negative neck palpation findings. The improved detection and nodal staging may promote appropriate therapeutic planning in these patients.

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## FDG PET/CT superior to CT/MRI in depicting occult neck metastasis

Anna Steere, Mar 25, 2014



$^{18}\text{F}$ -FDG PET/CT performs better than CT/MRI in depicting occult cervical metastatic nodes in patients with negative neck palpitation findings (stage cN0), according to a study published in the April issue of *Radiology*.

Accurate assessment of cervical nodal metastasis is vital when determining a treatment plan for patients with head and neck squamous cell carcinoma and stage cN0. CT and MRI are commonly used to depict tumor and lymph nodes in head and neck squamous cell carcinomas, but their scopes are constrained. Lead author Jong-Lyel Roh, MD, of the University of Ulsan College of Medicine in Seoul, Korea, and colleagues examined the clinical usefulness of  $^{18}\text{F}$ -FDG PET/CT and CT/MRI in detecting occult neck metastasis.

The prospective study included 91 patients with head and neck squamous cell carcinoma and stage cN0 who were assessed with the two types of modalities. Once the diagnostic values of  $^{18}\text{F}$ -FDG PET/CT and CT/MRI were compared, the researchers found that  $^{18}\text{F}$ -FDG PET/CT more sensitively exhibited nodal metastasis than CT/MRI at 69 percent versus 39 percent.

While  $^{18}\text{F}$ -FDG PET/CT had a high sensitivity across all levels, ranging from 63 to 100 percent, PET/CT's sensitivity was low at almost all levels with a range of zero to 38 percent. Per patient,  $^{18}\text{F}$ -FDG PET/CT exhibited a sensitivity of 71 percent and CT/MRI demonstrated a sensitivity of 50 percent.

$^{18}\text{F}$ -FDG PET/CT correctly determined occult metastasis in 27 of 38 patients, or 71 percent. CT/MRI, on the other hand, correctly identified cervical metastasis in 19 patients. Importantly,  $^{18}\text{F}$ -FDG PET/CT accurately portrayed CT/MRI false-negative findings in nine of 19 patients. However, it also produced false-negative results in 11 patients. The probability of occult neck metastasis was reduced to 12 percent with  $^{18}\text{F}$ -FDG PET/CT.

"Although CT/MR imaging is less sensitive than  $^{18}\text{F}$ -FDG PET/CT, it is still required for pretreatment evaluation of primary and neck diseases," wrote Roh and colleagues. "Improved detection and nodal staging with these modalities may promote appropriate therapeutic planning for patients with stage cN0 HNSCC."