

The role of whole-body FDG-PET in preoperative assessment of tumor staging in oral cancers

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Objective: The aim of this study is to clarify the clinical utility of 2-deoxy-2-[¹⁸F]fluoro-D-glucose (FDG) positron emission tomography (PET) in determining the TNM classification in patients with oral cancer. **Methods:** Twenty-five consecutive patients (14 male and 11 female; age range, 40 yr to 86 yr) with oral cancer were included in this study. The diagnostic accuracy for detecting cervical lymph nodes was investigated by comparing the results of CT and/or MRI and physical findings. For the semi-quantitative analysis, the tumor standardized uptake value (SUV) and tumor to background SUV ratio (T/B ratio) were assessed in primary tumors and cervical lymph nodes. **Results:** All primary lesions were visualized on FDG-PET images. Even though artifacts from dental materials near the lesion hampered the delineation of primary tumors on CT/MRI, the extent of primary tumors was accurately assessed by FDG-PET. The SUV and T/B ratio in the primary tumor classified in higher T grade (T3 and T4) was significantly higher than that in lower T grade (T1 and T2) (mean ± SD of SUV; 8.32 ± 2.99 vs. 5.15 ± 3.77 , $p < 0.01$, mean ± SD of T/B ratio; 6.96 ± 3.23 vs. 3.61 ± 2.76 , $p < 0.01$). The SUV and T/B ratio of metastatic lymph nodes were also significantly higher than those of normal lymph nodes (mean ± SD of SUV; 3.39 ± 1.69 vs. 1.55 ± 0.57 , $p < 0.001$, mean ± SD of T/B ratio; 2.46 ± 1.08 vs. 1.03 ± 0.22 , $p < 0.001$). Among these three methods, FDG-PET in conjunction with CT/MRI showed the highest accuracy of 92%, but there were no significant differences in diagnostic accuracy among the three methods. For the semi-quantitative analysis, a threshold SUV of 2.0 provided 100% sensitivity, 82% specificity, and 88% accuracy. Furthermore, a threshold T/B ratio of 1.5 provided 100% sensitivity, 100% specificity, and 100% accuracy. Regarding the detection of distant metastasis, there was one positive result in FDG-PET showing distant pulmonary metastasis. **Conclusions:** Whole-body FDG-PET is an effective and convenient diagnostic tool for the evaluation of tumor staging in patients with oral cancer. Tumor staging by whole-body FDG-PET may, in fact, supplement the conventional staging by means of CT/MRI and physical findings.

Key words: oral cancer, FDG-PET, SUV, cervical lymph node metastasis