F-18 fluorodeoxyglucose positron emission tomography for squamous carcinoma of the upper and lower gum

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Purpose We aimed to determine whether F-18 fluorodeoxyglucose (FDG) positron emission tomography (PET) imaging can diagnose and stage upper and lower gum squamous cell carcinoma. **Materials and Methods** We used FDG-PET to evaluate 75 patients aged 70 (SD, 9.9) y who had been pathologically diagnosed with squamous cell carcinoma of the upper (n = 31) and lower (n = 44) gums. Normal glucose levels were confirmed in all patients, who fasted for at least 5 h before being intravenously injected with 185 – 300 MBq of F18-FDG. Images were acquired one hour later using a GE Discovery ST Elite PET/CT machine. Regional FDG uptake in the affected area is expressed as maximal uptake values (SUV). Data were statistically analyzed using SPSS Version 11.0 software (SPSS Inc. Chicago, IL, USA). **Results** Hypermetabolic lesions with intense focal uptake (SUVmax > 2.5) were considered malignant. Positive FDG uptake was identified in primary lesions among 73 (97.3%) of 75 patients. The SUVmax of primary lesions of the lower and upper gums, respectively, were 10.3 (SD, 6.6) and 12.9 (SD, 7.5), respectively. The SUV max was 6.3 (SD, 2.9) in T1 (N = 24), 11.7 (SD, 6.6) in T2 (N = 24), 16.1 (SD, 6.6) in T3 (N=5) and 15.5 (SD, 7.6) in T4 (N=22). Lymph node metastasis was found in 21 patients and 51 of 54 patients were diagnosed as having N0 by PET/CT. The sensitivity, specificity and accuracy of FDG-PET were 80.0%, 85% and 81.3% for N0, 83.3%, 82.5% and 82.6% for N1, and 70%, 100% and 96% for N2, respectively, but FDG-PET detected distant metastasis in only one patient (100%). The SUVmax at primary lesions in males and females (P = 0.624), or location in the upper or lower gums (P = 0.479) did not significantly differ. On the other hand, differences were statically significant between T1 and T2, T1 and T4, T1 and T2, T2 and T4, T1-2 and T3-4, stages 1-2 and 3-4 ($P < 0.05$ for all). **Conclusion** Using F-18 FDG PET/CT imaging to evaluate squamous cell carcinoma of the upper and lower gums had good accuracy and predictive value in determining T factor, lymph node status and tumor staging. The SUV max significantly differed among T factors and stages in primary lesions, but not with respect to lymph node metastasis.