A characteristic of FDG-PET for the gingival cancer

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Abstract

FDG often more markedly accumulates in carcinoma of the gingiva than in that of the tongue. It is possible that ^{18}F of FDG binds to hydroxyapatite of destroyed bone because gingival carcinoma is accompanied by jaw bone invasion by the tumor in many cases. In this study, we performed PET of carcinomas of the gingiva and tongue using ^{11}C or ^{18}F-labeled choline, and compared their accumulations with that of FDG.

Twenty-three cases of tongue carcinoma and 16 cases of gingival carcinoma accompanied by jaw bone invasion were analyzed by PET. FDG or choline uptake was quantitatively assessed as a standardized uptake value (SUV), based on the radioactivity concentration in ROI, the administered dose of radionuclide, and the body weight of the patient.

The SUVs of FDG was higher in gingival carcinoma than in tongue carcinoma. On PET using ^{18}F-choline, no significant difference was noted in the SUVs between each them. The level of choline accumulation did not differ due to the presence of jaw bone invasion regardless of being labeled with ^{18}F or ^{11}C. The above findings suggested that the high

FDG accumulation level in cases with bone invasion was due to accumulation in other interstitial cells and not due to ^{18}F binding to hydroxyapatite.

The SUV in gingival carcinoma accompanied by jaw bone invasion was greater than that in tongue carcinoma on FDG-PET, for which there are 2 possibilities: one is the adsorption of ^{18}F to hydroxyapatite exposed by bone destruction, and the other is accumulation in interstitial cells gathering at site of destroyed bone and tumor cells. The ^{18}F-labeled choline accumulation level was similar to that of ^{11}C-choline in tongue and gingival carcinoma, suggesting that the involvement of ^{18}F adsorption to hydroxyapatite was small. These findings suggest that FDG accumulates in not only tumor cells but also bone metabolism-related interstitial cells, such as osteoblasts and osteoclasts.