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### EARLY CHANGES OF F-18 FLT UPTAKE AFTER IRRADIATION OF TUMOR IN ANIMAL MODEL

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**Purpose:** F-18 Fluorothymidine (FLT) has been introduced as a new radiotracer for imaging proliferating cell, but its potential for monitoring radiotherapy has not been fully investigated. The aim of this study was to evaluate early changes of FLT uptake after irradiation of tumor in animal model and microPET. **Methods:** Nine C3H/HeN mice with SCC-VII tumors in their right shoulders were divided into three groups according to radiation dose (0 Gy, 10 Gy and 20 Gy, n=3 in each group). At 1 hr after i.p. injection of 3.7 MBq of FLT, sequential microPET (Concord, R4) images were obtained on the day before radiation (day0), day1 and day 2 after radiation of tumor. Quantification was done using ASIPro<sup>TM</sup>. Tumor to background uptake (T/B) ratios were measured using ROIs in sum of three consecutive slices of coronal view with slice thickness of 0.085 cm. **Results:** Maximum T/B ratios in three groups (0 Gy, 10 Gy and 20 Gy) were 2.6±0.3, 3.1±1.0, 2.6±0.1 on day 0, and showed 5.3%, 59.1%, 57.5% decrease on day 1 and 22.7%, 54.2%, 59.5% decrease on day 2, respectively. Mean T/B ratios in three groups were 2.4±0.3, 2.7±0.5, 2.6±0.2 on day 0, and showed -6.5%, 52.8%, 50.4% decrease on day 1 and 11.6%, 47.4%, 53.9% decreased on day 2, respectively. In irradiated groups, maximum and mean T/B ratios were significantly decreased on day 1 and day 2 after irradiation (p < 0.000), and significantly lower than control group. However, there was no significant difference between 10 Gy and 20 Gy groups. In control (0 Gy) group, the T/B ratio was not changed on day 1, but it was decreased on day 2 (p=0.0093). **Conclusion:** The change of FLT uptake on 1 day after irradiation reflected early radiation induced changes of tumor, and it may be used for imaging early tumor response to radiotherapy.

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### Utility of PET-CT in Differentiation between the Malignant and Benign Lung Lesions over than 2 cm

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**Purpose:** To characterize <sup>18</sup>F-FDG accumulation with PET-CT for differentiation between benign and malignant lung lesions over than 2cm **Methods:** Sixty-three patients with pulmonary mass over than 2 cm on combined FDG PET-CT, histologically confirmed, were retrospectively reviewed. The peak SUV of mass was measured and the FDG uptake pattern was analyzed. FDG uptake pattern was divided into two groups as homogenous and inhomogeneous ones. Inhomogeneous group was further classified as ring like uptake, peripheral nodular uptake and homogenous uptake with peripheral nodular photon defect. It was included in the evaluation whether the peritumoral opacity without FDG accumulation around mass was or not. The statistical significance of differences among benign and malignant lesions was determined (unpaired T test). **Results:** Forty one masses were histologically confirmed to be malignant, whereas twenty two were benign. On PET-CT, malignant lesions showed higher SUV levels (malignancy vs benign : 9.22 vs. 3.28, p<0.0001). Twenty six malignant masses (63%) were inhomogeneous in FDG distribution and 24 cases of them (92%) showed ring like uptake pattern. Otherwise, 6 benign masses (27%) appeared inhomogenous on PET-CT images and 4 cases of them showed ring like FDG uptake. In 15 cases of the malignant lesions, the peritumoral opacities without FDG uptake were present. In benign lesions, only two cases had these opacities. **Conclusion:** The peak SUV level is the most available method in differentiation between benign and malignant lesions over 2 cm in lungs. The inhomogenous FDG accumulation of the mass may support the mass to be malignant. Moreover, peritumoral opacity without FDG uptake may also support the malignancy.