学位論文抄録

Usefulness of diffusion-weighted magnetic resonance imaging and (18)F-Fluorodeoxyglucose PET-CT in the diagnosis and predicting aggressiveness of non-small cell lung cancer

（小型非小細胞肺癌の診断と悪性度指標としての拡散強調画像およびFDG-PETの有用性）

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Abstract of the Thesis

Background and Purpose: Until recently, the usefulness of diffusion-weighted magnetic resonance imaging has been reported in the imaging of malignant tumors. And it was reported that diffusion-weighted magnetic resonance imaging had similar sensitivity and specificity as compared to fluorodeoxyglucose F 18 positron emission tomography for distinguishing between malignant and benign pulmonary nodules. This retrospective analysis examined whether diffusion-weighted magnetic resonance imaging might be as useful as positron emission tomography with fludeoxyglucose F 18 for (1) discriminating between non–small cell lung cancer and benign pulmonary nodules and (2) predicting aggressiveness of non–small cell lung cancer.

Methods: Diffusion-weighted magnetic resonance imaging and fluorodeoxyglucose F 18 positron emission tomography were performed before surgery in 110 patients with 124 pulmonary nodules smaller than 3 cm, including 96 non–small cell lung cancers and 28 benign nodules. Diffusion of water molecules in magnetic resonance imaging was measured by minimum value of apparent diffusion coefficient. The criterion standard was the result of histologic diagnosis or follow-up examination. Sensitivity and specificity for differentiating between cancers and benign nodules were compared between diffusion-weighted imaging and positron emission tomography. Apparent diffusion coefficient in diffusion-weighted imaging and fludeoxyglucose F 18 uptake in positron emission tomography were examined with respect to pathologic tumor stage; lymphatic, vascular and pleural involvements; histologic differentiation; and proliferative activity as determined by immunostaining with Ki-67.

Results: There were no significant differences between diffusion-weighted magnetic resonance imaging and fluorodeoxyglucose F 18 positron emission tomography in sensitivity or specificity for non–small cell lung cancer. Whereas positron emission tomography showed significant differences in fludeoxyglucose F 18 uptake between pathologic stages IA versus IB or more advanced stages; between tumors with and without lymphatic, vascular, or pleural involvement; between Ki-67 staining scores; and between well-differentiated and moderately or poorly differentiated adenocarcinomas ($P<.01–0.001$), no significant differences in apparent diffusion coefficient values in were observed.

Conclusions: Diffusion-weighted magnetic resonance imaging is equivalent to fluorodeoxyglucose F 18 positron emission tomography in distinguishing non–small cell lung cancer from benign pulmonary nodules but is not as useful for predicting aggressiveness of non–small cell lung cancer to successfully select patients for limited resection.