

Evaluation of correlation between response to radiotherapy and uptake of [¹⁸F]FRP-170 PET in head and neck squamous cell carcinoma

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Abstract

Head and neck squamous cell carcinoma (HNSCC) includes hypoxic cells which results in resistance to radiotherapy. [¹⁸F]FRP-170 PET has an ability to detect hypoxic region within the cancer. The purpose of this study is to evaluate a predictive value of [¹⁸F]FRP-170 PET in patients with HNSCC treated with radiotherapy. Five patients with HNSCC were examined with [¹⁸F]FRP-170 PET within two weeks before their radiotherapy. PET image was scanned 60 minutes after intravenous infusion of 370MBq [¹⁸F]FRP-170. The total tumor volume was calculated from pretreatment CT scans.

The tumor/muscle ratios (SUV max of tumor/SUV max of muscle) of [¹⁸F]FRP-170 of all patients were calculated. The hypoxic tumor volume was calculated as the tumor/muscle ratio greater than or equal to 1.25. The tumor/muscle ratio was 1.00 to 1.71, tumor volume was 6.5 to 103.6ml, the hypoxic volume was 0.4 to 3.4ml. Among the five patients, there was no significant difference was seen between hypoxic volume and tumor response. A positive correlation between the hypoxic volume and total tumor volume was exist.