

## Correlation between serum CEA level and metabolic volume as determined by FDG PET in postoperative patients with recurrent colorectal cancer

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To determine the correlation between serum CEA level and the metabolic volume by FDG PET in postoperative patients with recurrent colorectal cancer, FDG PET was performed in 29 consecutive patients with recurrent or metastatic colorectal cancer whose CEA levels were higher than 5 ng/ml. A whole body emission scan was performed 60 minutes after injecting 370–555 MBq of F-18 FDG. “PET volume” and “PET metabolic volume” of tumors were measured on FDG PET images. Based on an isocontour plot of tumor mass at 2.5 SUV (standardized uptake value), the metabolically active tumor “PET volume” was calculated. “PET metabolic volume” was obtained by multiplying the “PET volume” by the mean SUV of the tumor. All recurrent or metastatic lesions were single or multiple lesions of measurable size (axial diameter > 1 cm, minimum “PET volume” 3.5 cm<sup>3</sup>), and were verified by operation or by other imaging modalities (CT or MRI). There was a linear associations between “PET volume” and serum CEA level. Further regression analysis by least squares showed a highly significant model with an equation of volume = 41.2 + 0.471 • CEA ( $r^2 = 0.629$ ). However, no such association was found between “PET metabolic volume” and serum CEA level according to the residual normality test. In conclusion, “PET volume” measured by FDG PET and serum CEA level in colorectal cancer are significantly correlated. Tumor volume determined by FDG PET can be used as an effective marker of tumor burden in postoperative patients with colorectal carcinoma.

**Key words:** FDG PET, colorectal cancer, carcinoembryonic antigen, tumor volume