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An analysis of the physiological FDG uptake pattern in the stomach

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The purpose of this study was to clarify the normal gastric FDG uptake pattern to provide basic information to make an accurate diagnosis of gastric lesions by FDG PET.

We examined 22 cases, including 9 of malignant lymphoma, 8 of lung cancer, 2 of esophageal cancer, and 3 of other malignancies. No gastric lesions were observed in any of the 22 cases on upper gastrointestinal examinations using either barium meal or endoscopic techniques. The intervals between FDG PET and the gastrointestinal examination were within one week in all cases. The stomach regions were classified into the following three areas: U (upper)-area, M (middle)-area, and L (lower)-area. The degree of FDG uptake in these three gastric regions was qualitatively evaluated by visual grading into 4 degrees, and then a semiquantitative evaluation was carried out using the standardized uptake value (SUV).

Based on a visual grading evaluation, the mean FDG uptake score in the U-, M-, and L-areas was 1.14 ± 0.96, 0.82 ± 0.96, and 0.36 ± 0.49 (mean ± S.D.), respectively. The FDG uptake scores obtained in the three areas were significantly different (Friedman test, $p < 0.05$). Furthermore, the rank order of the FDG uptake score in each case ($U \geq M \geq L$) was found to be statistically significant (Cochran-Armitage trend test, $p < 0.05$). The mean SUVs of 11 cases in the three areas were 2.38 ± 1.03, 1.91 ± 0.71, and 1.34 ± 0.44 (mean ± S.D.), respectively. The SUV in the U-area was significantly higher than that in the L-area (Friedman test, $p < 0.05$). A significant difference in FDG uptake was observed among the three gastric areas, and the FDG uptake extent in all cases was $U > M > L$. In conclusion, the physiological gastric FDG uptake was significantly higher at the oral end. A stronger gastric FDG uptake at the anal end may therefore be suggestive of a pathological uptake.

Key words: FDG PET, physiological uptake, stomach