Distinct Uptake of ^{18}F -Fluorodeoxyglucose by Brown Adipose Tissue with a Catecholamine-Secreting Tumor

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Key words: pheochromocytoma/paraganglioma, ^{18}F -FDG-PET, brown adipose tissue

(Inter Med 49: 2363, 2010)

(DOI: 10.2169/internalmedicine.49.4293)

Picture 1.

A 24-year-old woman with paroxysmal episodes of hypertension and palpitation was found to have paraganglioma located at the left renal hilum (6.3 cm in size) as detected by

MRI scan, where radioactivity was exclusively accumulated by ^{131}I -MIBG scintigraphy. She had markedly increased plasma and urinary noradrenaline levels. ^{18}F -FDG-PET scan demonstrated an increased uptake not only in the tumor (Picture 1A, arrow head), but also in various adipose tissues, including cervical, supraclavicular, mediastinal, and mesenteric regions (Picture 1A, arrows). After tumor resection, her plasma and urinary noradrenaline levels were normalized with concomitant complete disappearance of FDG uptakes by the tumor as well as other regions (Picture 1B).

The increased ^{18}F -FDG uptake in various regions in the present case is most likely due to noradrenergic stimulated-glucose uptake by brown adipose tissue (BAT) via β_3 -adrenergic receptors (1, 2). In patients with catecholamine-secreting pheochromocytoma/paraganglioma, ^{18}F -FDG uptake could occur not only in the tumor, but also in BAT, thereby mimicking metastatic lesions. Therefore, ^{18}F -FDG-PET scan for the detection of primary and metastatic lesions should be cautiously interpreted in pheochromocytoma/paraganglioma.

References

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