Pyelo-cystic Reflux in F-18 FDG PET Scan Due to Ureteral Obstruction

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A 72-year-old woman with a history of cervical cancer was treated with brachytherapy and chemotherapy. Combined F-18 FDG PET/CT performed for restaging demonstrated increased FDG uptake in a hypodense cystic lesion at the posterior part of the right renal cortex and a hypermetabolic soft tissue mass at the right parailiac region suggestive of a metastatic lymph node causing ureteral obstruction. There had been no FDG uptake in the cystic lesion on the FDG PET/CT study performed 1 year before. These findings suggest that the increased FDG uptake in the cystic lesion was caused by pyelocystic reflux due to ureteral obstruction secondary to parailiac lymph node metastasis (Figs. 1 and 2).

Several renal lesions may have increased metabolism, such as renal cell carcinoma, lymphoma, oncocytoma, adult Wilms' tumor, angiomyolipoma, metastatic lesions, xanthogranulomatous pyelonephritis and infected cyst [1–9]. Most of these lesions are solid. Some infected renal cysts may be FDG avid,

but in this situation increased FDG uptake is observed on the wall of the cyst [8, 9]. In our case, FDG uptake was seen in the entire cystic lesion. The patient had no symptoms or laboratory findings related to infection. Cysts are the most common space-occupying lesions of the kidney. The vast majority of these are simple cysts that are usually unilateral and solitary. Simple cysts are asymptomatic, except when complications exist such as hemorrhage, infection or rupture [10]. There have been a few reports on spontaneous communications between renal cysts and the pyelocaliceal system, in most cases involving ruptures of the cysts into the pyelocaliceal system due to increased intracystic pressure caused by bleeding or infection of the cyst [11]. In the present case, the cause of the connection between the cystic cavity and the pyelocaliceal system is the increased pressure in the renal pelvic cavity due to the ureteral obstruction secondary to parailiac lymph node metastasis.

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Fig. 1 A 72-year-old woman with a history of cervical cancer was treated with brachytherapy and chemotherapy. The patient was referred to the Nuclear Medicine Department for restaging with F-18 fluorodeoxyglucose positron emission tomography/computed tomography (F-18 FDG PET/CT). The scan was performed 60 min after intravenous injection of 340 MBq (9.2 mCi) of F-18 FDG. Maximum intensity projection (a), axial fusion (b, d) and CT (c, e) at the level of the upper abdominal and pelvic level images showed increased FDG uptake in a hypodense cystic lesion at the posterior part of the right renal cortex

(arrows) and intensely accumulated FDG in the renal pelvis. A hypermetabolic soft tissue mass is also demonstrated at the right parailiac region (**bold arrow**) on axial slices of the pelvic region, suggestive of a metastatic lymph node causing ureteral obstruction (d, e). The right proximal ureter was dilated. After the initial routine PET/CT images, the patient received an injection of diuretic (40 mg furosemide) intravenously. The patient drank 500 ml of water then and voided. The delayed diuretic PET/CT images (f, g) show persistent increased FDG uptake in the hypodense lesion but partial washout of pelvic activity (**arrowhead**)

Fig. 2 Axial fusion (a) and CT images (b) from the previous F-18 FDG PET/CT study are shown. There is no FDG uptake in the cystic lesion at the posterior part of the right kidney (arrows).

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