

Synchronous bilateral renal clear cell carcinoma and incidental prostate gland carcinoma detected on ^{18}F -FDG PET/CT in one patient

Abstract

We present a case of synchronous bilateral renal cell carcinoma and prostate carcinoma in a 62 year old man. In a fluorine-18-fluorodeoxyglucose positron emission tomography (^{18}F -FDG PET) scan, the left renal mass showed intense ^{18}F -FDG uptake with maximum standardized uptake volume (SUVmax) of 8.12, while uptake in the right renal mass was minimal with SUVmax of 2.99. Fluorine-18-FDG uptake in the prostate gland lesion was moderate with SUVmax of 4.19. Histopathologically, both renal tumors were clear cell renal cell carcinoma with International Society of Urological Pathology (ISUP) Grade 2 and 3 for the right and left kidney, respectively and prostate gland lesion was typical prostate gland carcinoma.

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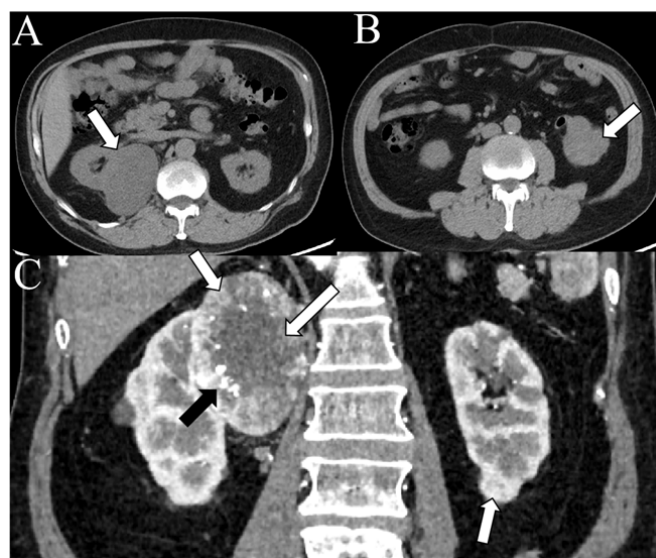


Figure 1. Masses were found in both kidneys of a 62 year old man during his routine health checkup by ultrasound. Contrast-enhanced computed tomography (CT) images show enhancing masses in the upper pole of the right kidney with the biggest being 77×52mm [white arrow in A (plain scan) and C (arterial phase)] and lower pole of the left kidney with the biggest being of 51×36mm [white arrow in B (plain scan) and C (arterial phase)]. Obvious enhancement of vascular (black arrow in C) and necrosis were found in the right renal mass (long white arrow in C). Tumors of both kidneys were highly suspected based on the contrast CT findings.

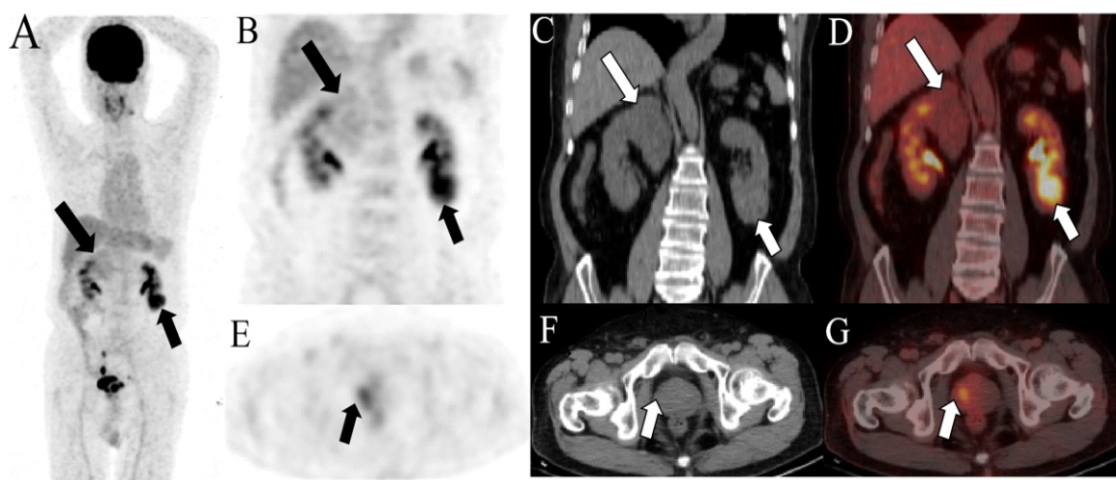


Figure 2. Fluorine-18-FDG PET/CT performed for baseline tumor staging demonstrates minimal ^{18}F -FDG uptake in the right renal mass in the upper pole of the kidney with SUVmax of 2.99 [black long arrow in A, maximum intensity projection (MIP) imaging; long arrow in B, PET imaging; C, CT imaging; and D, fusion imaging] and intense uptake in the mass in the left lower pole of the left kidney with SUVmax of 8.12 (black short arrow in A, MIP imaging; short arrow in B, PET imaging; C, CT imaging; and D, fusion imaging). The right side of the prostate gland has increased ^{18}F -FDG uptake with SUVmax of 4.19 but CT showed no abnormal density (arrow in E, PET imaging; F, CT imaging; and G, fusion imaging).

Blood examination results showed that the total prostate specific antigen (T-PSA) of the patient was greater than 100ng/mL (normal reference range: less than 4.57ng/L) and free prostate specific antigen (F-PSA) was 25.38ng/mL (normal reference range: less than 0.65ng/L). Fine-needle aspiration biopsy was performed and the result supported the diagnosis of prostate carcinoma. The patient underwent total nephrectomy of the right kidney and partial nephrectomy of the left kidney. Histopathological analysis revealed clear cell renal cell carcinoma (RCC) in both kidneys. The left kidney was ISUP grade 3 and the right kidney was ISUP grade 2. Fluorine-18-FDG PET detection of renal tumor in both kidneys has been reported in two cases with different ¹⁸F-FDG uptake level. One case had tumors with the same sub-type and the other with different sub-types [1-2]. It has been reported that the SUVmax may be an important indicator for predicting tumor grade in RCC and that high-grade RCC had a significantly greater SUVmax [3]. In our case, different ISUP grade was in accordance with ¹⁸F-FDG uptake level in both renal masses. This case demonstrates the advantages of whole-body ¹⁸F-FDG PET/CT in the detection of tumors and to some extent in the prediction of tumor grade.

Bibliography

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