

## Why Uptake Matters? – A Case of the Second Primary in a Benign-Looking Renal Cyst of a Patient Undergoing 18F-Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography for Treated Head-And-Neck Cancer

### Abstract

A 60-year-old male, a diagnosed case of squamous cell carcinoma of the hypopharynx, underwent 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) for response assessment. PET/CT revealed mildly increased 18F-FDG uptake and contrast enhancement in the region of the primary, which was suggestive of postirradiation changes. Interestingly, a benign-looking cyst was seen in the shrunken, poorly-functioning left kidney, with mildly elevated 18F-FDG uptake. Structurally, the lesion appeared benign on ultrasound and sequential CT images. However, 18F-FDG was the only feature which alluded to the possibility of another pathology like low-grade malignancy or oncocytoma. The lesion was biopsied, which revealed Clear-Cell International Society of Urologic Pathologists grade-1 renal cell carcinoma. Consequently, the patient was posted for surgery.

**Keywords:** 18F-fluorodeoxyglucose positron emission tomography/computed tomography, Bosniak 2, International Society of Urologic Pathologists grade, renal cell carcinoma, second primary

Incidence of the second primary in cases with head-and-neck cancers is relatively high, with a Standardized Incidence Ratio (SIR) of 2.2.<sup>[1,2]</sup> Approximately a third of associated mortality with the disease can be on account of the secondary primary disease.<sup>[2]</sup> Therefore, earlier identification is important to ensure long-term survival, especially when the primary disease has been fully controlled/treated. Among different sites, SIR for the hypopharynx is the highest, with the upper aerodigestive tract, lungs, and esophagus being commonly involved sites.<sup>[1-3]</sup> While renal lesions are not as frequent, they are relatively more common in cases with index involvement of the hypopharynx.<sup>[2,4]</sup> Furthermore, smoking is an independent risk factor for RCC.<sup>[5]</sup> RCC in patients with positive smoking history is often diagnosed at an advanced stage with a poorer prognosis.<sup>[6,7]</sup> In this reported case, while the probability of renal lesion being a second primary was not low, the appearance of the lesion was inconsistent with a malignant lesion [Figure 1]. Ultrasound examination and CECT, along with analysis of sequential CT images

(9 months apart) all pointed to it being a benign lesion [Figure 2]. Such benign appearing hyperattenuating cysts (Bosniak 2) without significant contrast enhancement can be considered reliably benign and do not require follow-up.<sup>[8,9]</sup> Therefore, it was likely that based on structural features alone, the lesion might have been discounted as benign and not surveilled further. The only reason for pushing for a biopsy was the 18F-FDG uptake, which allowed a diagnosis of low-grade RCC at an early stage. This changed the management and allowed curative treatment in the form of partial nephrectomy. Furthermore, the low uptake within the lesion correlated with the grade of the tumor (ISUP 1). Therefore, in conclusion, any 18F-FDG uptake in renal cysts should be closely evaluated, even when findings in CT are discordant.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given

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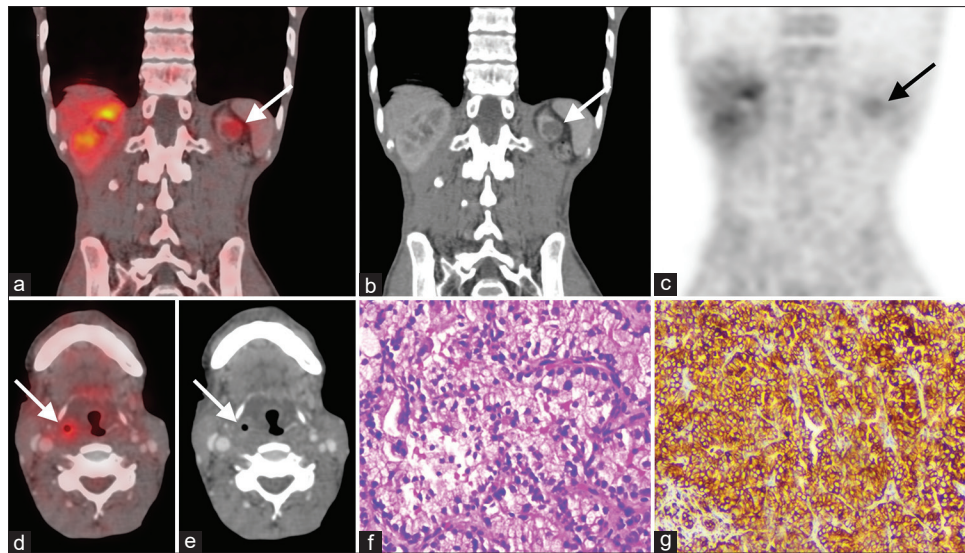
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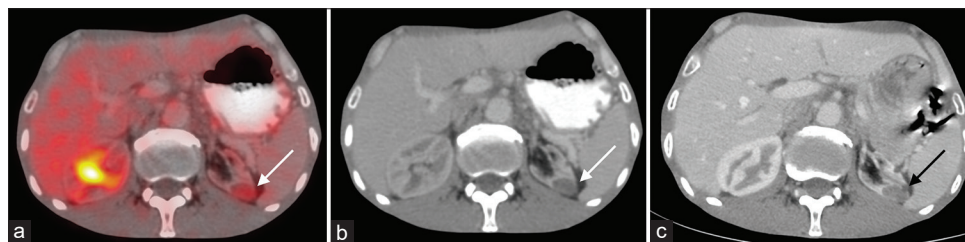
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**Figure 1:** 18F-FDG PET/CT {coronal fused (a), coronal CT (b) and coronal PET (c)} images in a 60 year old male, showing a mildly enhancing cortical renal cystic lesion (white arrow) with low-grade FDG uptake. The patient was a treated case of CA Hypo-pharynx and no significantly elevated FDG uptake was noted at the treated site as shown in axial fused PET/CT (d) and CT (e) images. Despite its benign appearance in CT, a biopsy was obtained from the renal lesion in view of elevated metabolic activity. Biopsy revealed the lesion to be Clear Cell RCC (f) with Vimentin positivity (g)



**Figure 2:** Transaxial PET/CT (a), CECT (B; from the same PET/CT) and older CECT (C; at baseline) images of the same patient. The CECT in PET/CECT (White arrows in transaxial PET/CT [a] and CECT [b]) was compared with pre-therapy CECT images (Black arrow in CECT [c]) and no significant change was noted over a period of 9 months

his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

### References

- Morris LG, Sikora AG, Patel SG, Hayes RB, Ganly I. Second primary cancers after an index head and neck cancer: Subsite-specific trends in the era of human papillomavirus-associated oropharyngeal cancer. *J Clin Oncol* 2011;29:739-46.
- Adjei Boakye E, Buchanan P, Hinyard L, Osazuwa-Peters N, Schootman M, Piccirillo JF. Incidence and risk of second primary malignant neoplasm after a first head and neck squamous cell carcinoma. *JAMA Otolaryngol Head Neck Surg* 2018;144:727-37.
- Priante AV, Castilho EC, Kowalski LP. Second primary tumors in patients with head and neck cancer. *Curr Oncol Rep* 2011;13:132-7.
- Ng SP, Pollard C 3<sup>rd</sup>, Kamal M, Ayoub Z, Garden AS, Bahig H, *et al.* Risk of second primary malignancies in head and neck cancer patients treated with definitive radiotherapy. *NPJ Precis Oncol* 2019;3:22.
- Hunt JD, van der Hel OL, McMillan GP, Boffetta P, Brennan P. Renal cell carcinoma in relation to cigarette smoking: Meta-analysis of 24 studies. *Int J Cancer* 2005;114:101-8.
- Tsivian M, Moreira DM, Caso JR, Mouraviev V, Polascik TJ. Cigarette smoking is associated with advanced renal cell carcinoma. *J Clin Oncol* 2011;29:2027-31.
- Parker A, Lohse C, Chevillat J, Leibovich B, Igel T, Blute M. Evaluation of the association of current cigarette smoking and outcome for patients with clear cell renal cell carcinoma. *Int J Urol* 2008;15:304-8.
- Silverman SG, Pedrosa I, Ellis JH, Hindman NM, Schieda N, Smith AD, *et al.* Bosniak Classification of Cystic Renal Masses, Version 2019: An Update Proposal and Needs Assessment. *Radiology* 2019;292:475-88.
- Hindman NM, Hecht EM, Bosniak MA. Follow-up for Bosniak category 2F cystic renal lesions. *Radiology* 2014;272:757-66.