

Case report

Presentation of Unusual Tracheal Metastasis on Fluorine-18 Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography after 9 Years in Postnephrectomy Patient of Renal Cell Carcinoma: A Case Report and Review of Literature

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Abstract

Tracheal metastases from renal cell carcinoma (RCC) are extremely rare. Most common primary malignancy metastasizing to this unusual location usually comes from lung region while it is rare to have tracheal metastases from nonpulmonary malignancies such as breast, thyroid, colorectal carcinoma, and melanoma. The lesions detected on fluorine-18 fluorodeoxyglucose (F-18 FDG) positron emission tomography/computed tomography (PET/CT) scan, especially in the head and neck region, soft tissue, and muscular compartment during follow-up of RCC patients raise the possibility of metastatic lesions in these regions, though rarely encountered. F-18 FDG PET/CT proved to be a valuable noninvasive imaging tool in detecting the very unusual distant metastases and multisystem involvement many years after nephrectomy in RCC in a single session in the present case.

Keywords: Fluorine-18 fluorodeoxyglucose positron emission tomography/computed tomography, renal cell cancer, tracheal metastasis

Introduction

Renal cell carcinoma (RCC) is the most common type of kidney cancer in adults arising from the proximal convoluted tubule lining of the kidney. These patients remain clinically asymptomatic for most of its course, and only minority of patients have classic presentation of abdominal pain, hematuria, and flank mass, often indicating the advanced stage.^[1] A kidney tumor may go unnoticed until metastatic disease appears.

Fluorine-18 fluorodeoxyglucose (F-18 FDG) positron emission tomography/computed tomography (PET/CT) has shown higher sensitivity for detecting metastatic disease rather than primary disease. F-18 FDG PET/CT has shown its utility in detecting the isolated potential metastatic sites in cases of RCC.^[2]

We report an extremely rare case of metastatic tracheal lesion in a 53-year-old patient of RCC postnephrectomy 9 years back. He presented with a recent history of noisy breathing. The F-18 FDG PET/CT study revealed tracer avid tracheal lesion, shown to be metastatic lesion from

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RCC on histopathology examination. We have also reviewed the literature for RCC patients presenting with rare metastatic sites.

Case Report

A 53-year-old man postnephrectomy for left side RCC (Robson Stage II) in the year 2005 with histopathology of clear cell type was on regular follow-up without any residual or recurrent disease in between. However, 6 years postnephrectomy; the patient was diagnosed with lung metastases from RCC and put on sunitinib-based therapy in the year 2011 with favorable response. The patient presented with noisy breathing of 3 months duration in the year 2014 and underwent F-18 FDG PET/CT scan for restaging. The PET/CT imaging revealed tracer avid tracheal lesion and lung nodules [Figure 1a-c]. The tracheal lesion was excised with the help of bronchoscope to relieve his respiratory symptoms. The tracheal lesion histopathology showed tumor with ulcer covered by clusters of bacterial colony. The tissue at the ulcer bed was grossly necrotic (H and E, $\times 50$) [Figure 1d] and the high-power photomicrograph (H and E, $\times 450$) [Figure 1e]

of the tumor beneath the ulcer showed clusters of pale round to oval cells with centrally placed mildly pleomorphic hyperchromatic nuclei with moderate amount of cytoplasm separated into small lobules by fibrocollagenous tissue confirming diagnosis of tracheal metastasis from the RCC. The patient was treated with fractionated radiotherapy to the neck region. Repeat PET/CT study post 6 months showed resolution of FDG uptake and size regression in the ill-defined tracheal area and subcentimetric lung nodular lesions with normal left renal fossa [Figure 2a-d].

Discussion

RCC is the most common lethal urological malignancy contributing to 3% of all adult malignancies. Approximately, 30% of RCC patients present with metastatic disease initially, and overall survival has been shown to be significantly poor in metastatic disease in comparison to tumor confined within the capsule.^[1]

RCC can metastasize to any region in the body having the propensity to metastasize to rare sites.^[3] A few sporadic

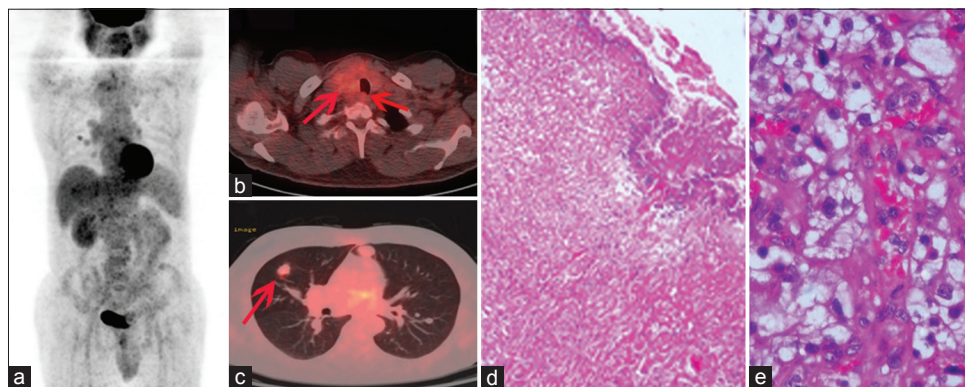


Figure 1: Positron emission tomography/computed tomography maximal intensity projection (a), fused axial (b and c) images showing increased tracer uptake in the tracheal lesion and lung nodules (arrows) suggesting metastatic involvement. Microphotograph (d) of tracheal lesion biopsy showed the tumor with ulcer and necrosis (H and E, $\times 50$). Microphotograph (e) showing clusters of pale round to oval cells with centrally placed mildly pleomorphic hyperchromatic nuclei with moderate amount of cytoplasm separated into small lobules by fibrocollagenous tissue, confirming tracheal metastasis (H and E, $\times 450$)

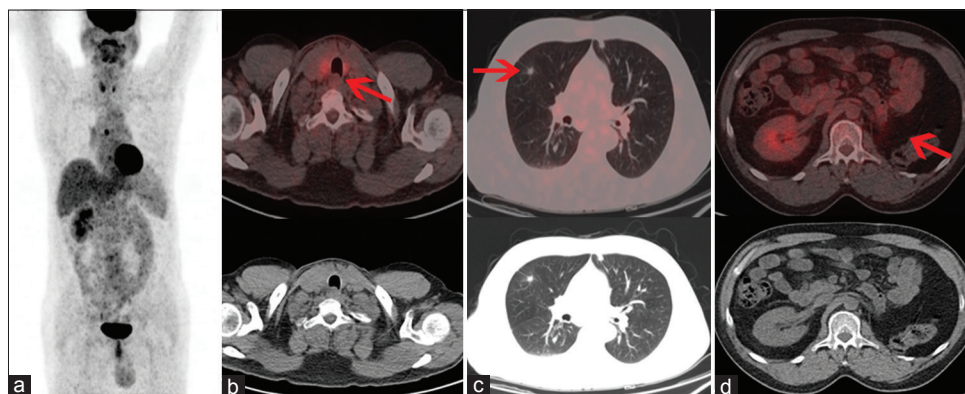


Figure 2: Posttherapy positron emission tomography/computed tomography maximal intensity projection (a) fused and computed tomography axial (b-d) imaging showed resolution of tracer avidity with regression in size in tracheal lesion, lung nodule, and normal left renal fossa

case reports of unusual metastatic location in RCC patients are published in the literature. The metastases from RCC may spread through arterial, venous, and lymphatic circulations. The head and neck region may be involved through Batson's venous plexus (a valveless venous system extending from the skull to the sacrum) or through the thoracic lymphatic duct.^[4] The metastases from RCC most commonly involve the lung, regional lymph nodes, bone, liver, adrenal glands, contralateral kidney, and brain^[5] however, 15% of patients of RCC may have the metastases in head and neck region.^[4] Azam *et al.* and Abbaszadeh-Bidokhty *et al.* have reported total of 33 cases of RCC metastasis to tongue since 1911 in their review of literature^[3,6] F-18 FDG PET/CT study had also shown its utility in detection of rare metastatic sites in RCC patients in few of the case reports in the literature. Win *et al.* reported omental nodular deposits detected by F-18 FDG PET/CT scan in aggressive form of RCC.^[7] Tatoglu *et al.* showed the usefulness of F-18 FDG PET/CT in detecting metastasis in the subcutaneous fatty tissue of the right thigh region and similarly Bhoil *et al.* presented an isolated deltoid muscle metastasis 12 years after radical nephrectomy.^[2,8]

Tracheal metastasis from primary lung cancer is commonly seen, but very rare site of involvement from nonpulmonary malignancies with the prevalence of 2% found in autopsy studies. Tracheal metastases from nonpulmonary malignancies such as breast, colorectal carcinoma, and kidney have been reported in literature.^[9] Lee *et al.* demonstrated the tracheal metastasis from colon cancer with the help of F-18 FDG PET/CT scan.^[10]

We present the index case of extremely rare tracheal metastasis detected by F-18 FDG PET/CT scan 9 years postnephrectomy for RCC. To the best of our knowledge, this is the first case report of metastatic involvement of trachea from RCC detected by PET/CT scan. F-18 FDG PET/CT has shown its utility in the localization of unusual metastatic sites, facilitating the development of an appropriate treatment plan in RCC patients.^[10] PET/CT study similarly detected rare site of tracheal metastasis and facilitated its resection followed with local radiotherapy in the present case emphasizing the role of F-18 FDG PET/CT in detection of metastatic disease at a very unusual site.

Conclusion

Metastases from RCC can present at unusual sites with unpredictable symptoms any time during follow-up. Our case report emphasized that tracheal metastasis might be a possibility in the patients of RCC even many years after postnephrectomy. F-18 FDG PET/CT assists in early detection of metastatic disease and to decide on appropriate management thereon.

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Conflicts of interest

There are no conflicts of interest.

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