

Abscopal Effect Demonstrated on [18F]FDG PET/CT in a Case of Renal Cell Carcinoma Postnephrectomy

Abstract

Renal cell carcinoma accounts for 3% of all malignancies with many of them presenting with metastasis at the time of presentation. The abscopal effect, a phenomenon characterized by systemic bystander effects on nontargeted lesions due to local therapy, has been extensively studied in the context of radiotherapy and immunotherapy. However, documentation of the abscopal effect following surgery remains limited. We present a case of a 67-year-old Indian male diagnosed with clear cell renal cell carcinoma (RCC), who underwent left radical nephrectomy. Baseline staging and postnephrectomy follow-up scans with fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET-CT) revealed an FDG-avid primary lesion in the left kidney with metastasis to the left lung. Surprisingly, the follow-up FDG PET-CT scan demonstrated the resolution of the left lung metastasis, indicating the occurrence of the abscopal effect resulting from the local nephrectomy. This rare clinical observation highlights the potential of surgery to induce immunogenic tumor neoantigens release and inflammatory factors, leading to systemic antitumor effects. While the abscopal effect has been extensively studied in the context of radiotherapy and immunotherapy, there is a scarcity of studies reporting nephrectomy promoting such systemic effects. The combination of radiotherapy and immunotherapy has shown promising results in enhancing tumor immunosuppression and facilitating the abscopal effect. We report a case of RCC with lung metastasis showing abscopal effect with resolution of lung nodule postnephrectomy on 18-F-FDG PET-CT.

Keywords: *Abscopal effect, fluorodeoxyglucose positron emission tomography/computed tomography, renal cell carcinoma*

In India, the estimated incidence of renal cell carcinoma (RCC) among males is about 2/100,000 population and among females is about 1/100,000 population. Only a few studies related to survival of RCC patients in India are available in the medical literature.^[1] The most common histopathological variant of RCC is clear cell carcinoma, followed by papillary and then chromophobe carcinoma.^[2] We present the case of a 67-year-old Indian male who presented with a right lower abdominal mass which after biopsy revealed clear cell type renal cell carcinoma. The patient was referred for baseline staging and postnephrectomy follow-up scan with fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET-CT). On FDG PET -CT, Figure 1 (a) MIP showed increased intensity in the primary (b and c) showed FDG avid primary in the left kidney with metastasis

to (d and e) to left lung. The patient underwent left radical nephrectomy and was referred for follow FDG PET-CT. On follow-up FDG PET-CT (f) MIP showed no abnormal FDG uptake (g and h) showed post left nephrectomy status and (i and j) showed resolution of left lung metastasis due to the abscopal effect from local nephrectomy. The term abscopal effect from the Latin ab Scopus, meaning “away from the target,” defines the systemic bystander effects on nontargeted lesions with local therapy due to the release of immunogenic tumor neoantigens and inflammatory factors.^[3] The abscopal effect although much studied is a rare phenomenon to be observed in routine clinical practice and is most commonly encountered with radiotherapy.^[4] Abscopal effect is well documented in many cases postradiotherapy and immunotherapy but although known there are very

**Sambit Sagar,
Dikhra Khan,
Nivedita Kundu,
Shamim Ahmed
Shamim,
Rakesh Kumar**

*Department of Nuclear
Medicine, All India Institute of
Medical Sciences, New Delhi,
India*

Address for correspondence:

*Dr. Rakesh Kumar,
Department of Nuclear
Medicine and PET-CT, All India
Institute of Medical Sciences,
New Delhi - 110 029, India.
E-mail: rkphulia@yahoo.com*

Received: 12-03-2023

Revised: 23-06-2023

Accepted: 09-08-2023

Published: 18-11-2024

Access this article online

Website:

<https://journals.lww.com/ijnm>

DOI: 10.4103/ijnm.ijnm_30_23

Quick Response Code:



How to cite this article: Sagar S, Khan D, Kundu N, Shamim SA, Kumar R. Abscopal effect demonstrated on [18F]FDG PET/CT in a case of renal cell carcinoma postnephrectomy. *Indian J Nucl Med* 2024;39:320-2.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

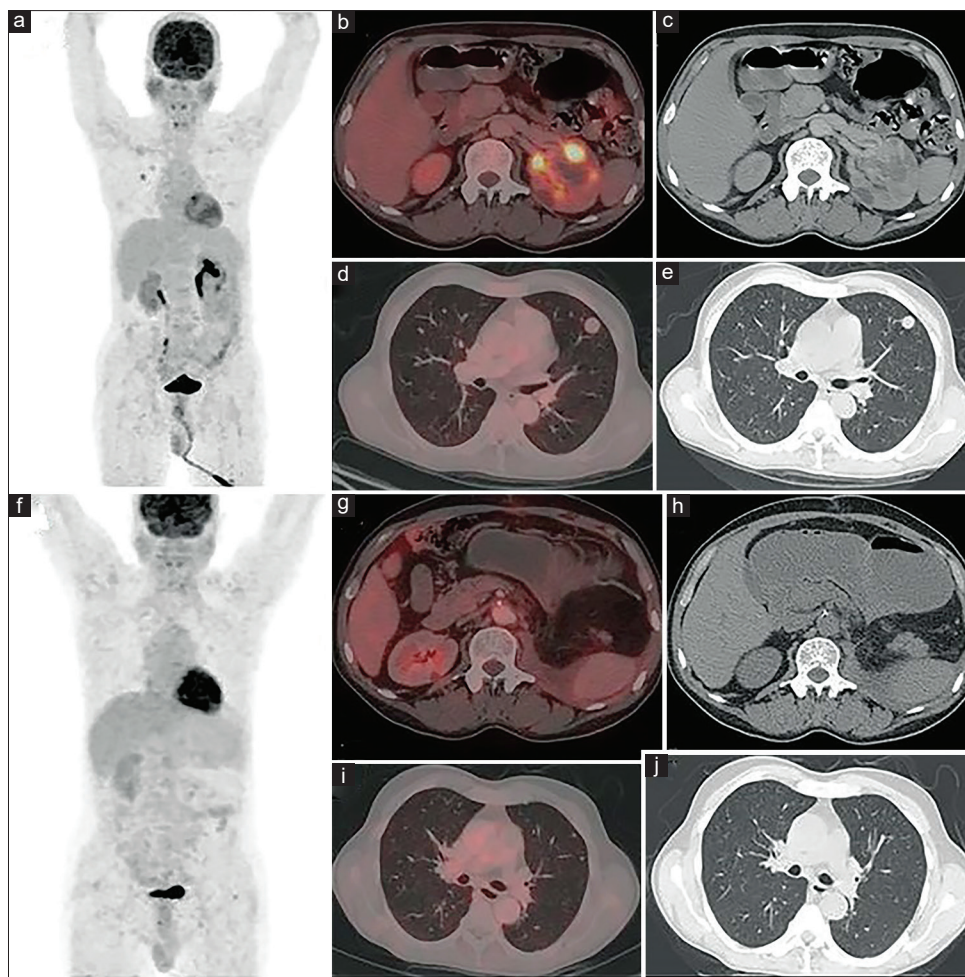


Figure 1: (a) MIP showed increased intensity in the primary (b and c) showed FDG avid primary in the left kidney with metastasis to (d and e) to left lung. The patient underwent left radical nephrectomy and was referred for follow FDG PET-CT. On follow-up FDG PET-CT (f) MIP showed no abnormal FDG uptake (g and h) showed post left nephrectomy status and (i and j) showed resolution of left lung metastasis due to the abscopal effect from local nephrectomy

few cases documenting abscopal effect postsurgery.^[5] Recently, multiple studies have revealed that combined radiotherapy and immunotherapy can be more effective at breaking tumor immunosuppression and demonstrating abscopal effect compared to radiotherapy alone^[6,7] and some studies suggesting that cytoreductive nephrectomy most of the time plays an unpredictable role for patients with metastatic RCC.^[8] This case reiterates the role of nephrectomy in the management of metastatic RCC.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Abraham GP, Cherian T, Mahadevan P, Avinash TS, George D, Manuel E. Detailed study of survival of patients with renal cell carcinoma in India. *Indian J Cancer* 2016;53:572-4.
2. Pallagani L, Choudhary GR, Himanshu P, Madduri VK, Singh M, Gupta P, *et al.* Epidemiology and clinicopathological profile of renal cell carcinoma: A review from tertiary care referral centre. *J Kidney Cancer VHL* 2021;8:1-6.
3. Formenti SC, Demaria S. Systemic effects of local radiotherapy. *Lancet Oncol* 2009;10:718-26.
4. Liu Y, Dong Y, Kong L, Shi F, Zhu H, Yu J. Abscopal effect of radiotherapy combined with immune checkpoint inhibitors. *J Hematol Oncol* 2018;11:104.
5. Shields LB, Rezazadeh Kalebasty A. Spontaneous regression of delayed pulmonary and mediastinal metastases from clear cell renal cell carcinoma. *Case Rep Oncol* 2020;13:1285-94.
6. Ngwa W, Irabor OC, Schoenfeld JD, Hesser J, Demaria S,

- Formenti SC. Using immunotherapy to boost the abscopal effect. *Nat Rev Cancer* 2018;18:313-22.
7. Golden EB, Chhabra A, Chachoua A, Adams S, Donach M, Fenton-Kerimian M, *et al.* Local radiotherapy and granulocyte-macrophage colony-stimulating factor to generate abscopal responses in patients with metastatic solid tumours: A proof-of-principle trial. *Lancet Oncol* 2015;16:795-803.
 8. Aben KK, Heskamp S, Janssen-Heijnen ML, Koldewijn EL, van Herpen CM, Kiemeny LA, *et al.* Better survival in patients with metastasised kidney cancer after nephrectomy: A population-based study in the Netherlands. *Eur J Cancer* 2011;47:2023-32.