

CASE REPORT

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# Pulmonary Tc<sup>99m</sup>-PSMA uptake in asymptomatic COVID-19 patient: incidental finding in SPECT/CT study

Forough Kalantari<sup>1\*</sup> , Reza Vali<sup>2</sup>, Elham Kalantari<sup>3</sup> and Ghasemali Divband<sup>4</sup>

## Abstract

**Background:** As there are comparative studies between <sup>68</sup>Ga-PSMA and <sup>99m</sup>Tc-PSMA and spectrum of PSMA expression, this is the first case report that notifies distribution of <sup>99m</sup>Tc-PSMA on COVID-19 pneumonia era on the literature.

### Case presentation

An asymptomatic 70-Y-old male who is known case of prostate adenocarcinoma underwent initial staging. SPECT/CT of the chest region reveals bilateral peripheral multifocal ground glass opacities which shows <sup>99m</sup>Tc-PSMA uptake. Diagnosis of corona virus was confirmed by positive RT-PCR.

**Discussion:** Unexclusive role of radiotracers in nuclear medicine has an importance for wide range of applications. Comparison between <sup>68</sup>Ga-PSMA and <sup>99m</sup>Tc-PSMA in detection of metastatic disease in prostate cancer is also under evaluation.

**Conclusions:** This case implicates possible role of PSMA imaging in inflammation/infection process as well as necessity for lung review in hybrid imaging especially during this recent pandemic.

**Keywords:** <sup>99m</sup>Tc-PSMA, COVID-19, Prostate cancer

## Background

A spectrum of PSMA expression in benign and malignant findings such as infectious/inflammatory process was reported [1]. There are few reports for <sup>68</sup>Ga-PSMA uptake in COVID-19 pneumonia [2]. But there is no previously reported case of <sup>99m</sup>Tc-PSMA on COVID-19 as our knowledge. It is also decisive for nuclear medicine physician to know the other possible reasons of <sup>99m</sup>Tc-PSMA uptake for the best interpretation.

## Case presentation

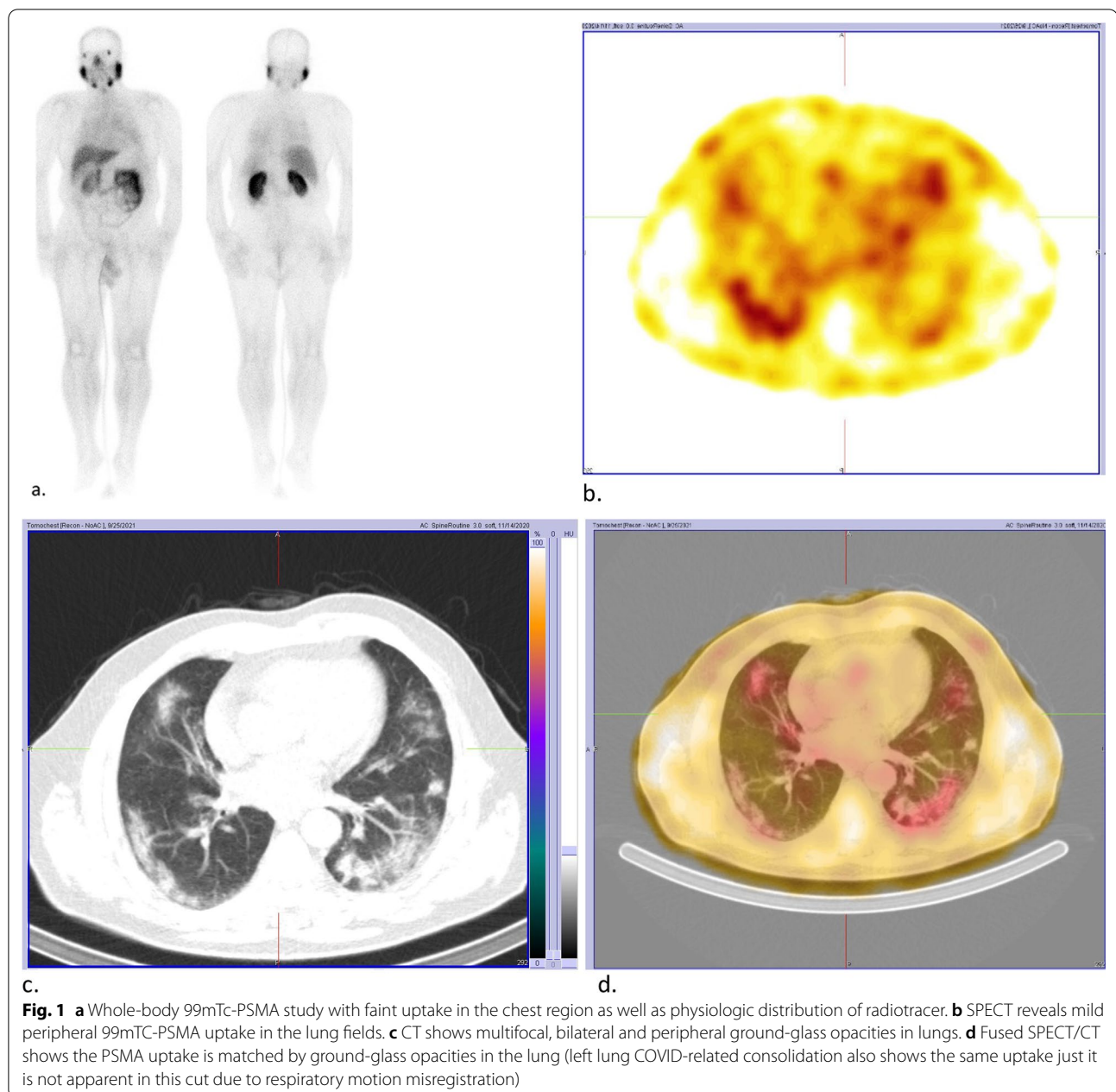
A 70-Y-old male who have biopsy proven prostate adenocarcinoma with Gleason score of 6 (3 + 3) and PSA level 36 ng/ml underwent a <sup>99m</sup>Tc-PSMA SPECT-CT for initial staging.

A dose of 20 mci (740 MBq) was injected intravenously, and 4 h later, whole-body images and thoracoabdominopelvic SPECT/CT images were performed using the Siemens Symbia Intevo SPECT/CT dual-head variable angle gamma camera.

SPECT/CT scan images revealed heterogeneous PSMA uptake in prostate lobes consistent with previously known malignancy. An incidental finding of multifocal, bilateral and peripheral ground-glass opacities in lungs with mild <sup>99m</sup>Tc-PSMA uptake are noticed (Fig. 1). Otherwise, no abnormal PSMA avid lesions are seen throughout the body.

\*Correspondence: Foroughkalantari@gmail.com

<sup>1</sup> Department of Nuclear Medicine, School of Medicine Hazrat-e-Rasool General Hospital, Iran University of Medical Science, Tehran, Iran  
Full list of author information is available at the end of the article



Regarding viral outbreak, the first diagnosis is COVID-19 pneumonia. Although the patient had no any respiratory symptoms, RT-PCR was performed and the result was positive.

### Discussion

Unexclusive role of radiotracers in nuclear medicine has an importance in wide range of applications. Not to misinterpret, every 99mTc-PSMA uptake in lung fields as metastasis in staging of a prostate adenocarcinoma is crucial. Comparison between 68Ga-PSMA and 99m

Tc-PSMA in detection of metastatic disease in prostate cancer is still under evaluation [3, 4]. There are few case reports of incidental detection of COVID-19-associated pneumonia by different tracers on nuclear medicine examinations such as 68Ga-PSMA PET/CT, 18F-FDG PET/CT and thyroid scintigraphy [5–8].

### Conclusion

This case implicates the possible role of PSMA imaging in active inflammatory/infectious process. This may be useful for evaluation of response to treatment of

inflammatory disease. Also, as many COVID-19 patients are asymptomatic, it is necessary for nuclear medicine departments to review lung window filed in hybrid imaging even in unrelated pathologies.

#### Abbreviations

68Ga-PSMA: 68 Gallium-prostate-specific membrane antigen; 99mTc-PSMA: Technetium-99m-prostate-specific membrane antigen; COVID-19: Coronavirus disease; SPECT/CT: Single-photon emission computed tomography/computed tomography; PSA: Prostate-specific antigen; MBq: Megabecquerels; RT-PCR: Reverse transcription polymerase chain reaction; 18F-FDG: 18Fluorine-fluorodeoxyglucose; PET/CT: Positron emission tomography/computed tomography.

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#### Authors' contributions

Authors performed the scan and wrote the manuscript. All authors read and approved the final manuscript.

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#### Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

#### Declarations

##### Ethics approval and consent to participate

There was no conflict of interest either in designing and accomplishment of this study. Data is available: This manuscript has been read and approved by all the authors which represent our honest report of hard working. The material has not been previously published or submitted elsewhere for publication. There were no sources of funding (institutional, private and corporate financial support) for the work reported in this paper. Authors confirm that the statements of written informed consent from legally authorized representatives/parents/guardians are available.

##### Consent for publication

Authors confirm that the statements of written informed consent from legally authorized representatives/parents/guardians are available.

##### Competing interests

The authors declare that they have no competing interests.

##### Author details

<sup>1</sup>Department of Nuclear Medicine, School of Medicine Hazrat-e-Rasool General Hospital, Iran University of Medical Science, Tehran, Iran. <sup>2</sup>The Hospital for Sick Children, University of Toronto, Toronto, ON, Canada. <sup>3</sup>Department of Pulmonology, School of Medicine, Isfahan University of Medical Science, Isfahan, Iran. <sup>4</sup>Department of Nuclear Medicine, Jam Hospital, Tehran, Iran.

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