



Case Report

[⁶⁸Ga]Ga-Pentixafor PET/CT uptake due to COVID-19 infection: An incidental finding in a patient with high-grade oligodendroglioma

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ABSTRACT

A 56-year-old woman with new-onset aphasia and mood changes was diagnosed with a left temporal mass. The surgery was done. She was referred for a trial of post-operative study of in vivo evaluation of CXCR4 expression using [⁶⁸Ga]Ga-Pentixafor (Pars-Cixafor™) PET/CT in high-grade glioma. The imaging from the brain revealed no evidence of tumoral remnant. Furthermore, the patient represented positive COVID-19 PCR about 4 weeks prior to the study. Surprisingly, mild diffuse uptake was noted in the base and periphery of both lungs with ground glass opacities (GGO) and consolidations (SUVmax = 2.60) with CXCR4-avid hilar lymph nodes (SUVmax up to 3.42).

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INTRODUCTION

CXCR4 (a G-coupled protein) is one of the C-X-C motifs-based chemokine family that served as a pathway in cell signaling and communication between stroma and tumoral/non-tumoral cells [1]. [⁶⁸Ga]Ga-Pentixafor PET/CT evaluates in vivo over-expression of this protein in various cancers especially in high-grade glioma [2, 3]. Expression is usually low or negligible in the non-malignant cells except WBCs and monocytes [4].

CASE PRESENTATION

A 56-year-old woman with a history of new-onset aphasia and recent mood changes was diagnosed with a left temporal mass (3 × 3 × 1 cm). After surgical resection, the diagnosis of anaplastic oligodendroglioma (WHO grade III) was made. She was referred for a trial of post-operative evaluation of CXCR4 expression using [⁶⁸Ga]Ga-Pentixafor

(Pars-Cixafor™) PET/CT since high-grade glioma highly expresses this protein. Radio-labeling was done under GMP regulations via a fully-automated labeling module with ⁶⁸Ga eluted from PARS-GalluGEN ⁶⁸Ge/⁶⁸Ga generator. Imaging was performed on a 6-slice dedicated PET/CT scanner 60 minutes post-injection of 149.11 MBq (4.03 mCi) of [⁶⁸Ga]Ga-Pentixafor. Diagnostic CT acquisition (120 Kv, 240mAs, slice thickness 3 mm, 512×512 matrix size, increment of 30 mm/s, rotation time of 0.5s, and pitch index of 0.55) was made with no contrast, followed by one-FOV PET imaging.

DISCUSSION

The skull and brain images only revealed evidence of surgical manipulation and previous craniotomy with calcification within the left temporal lobe with no CXCR4 avidity suggestive of no tumor remnant (Figure 1A).

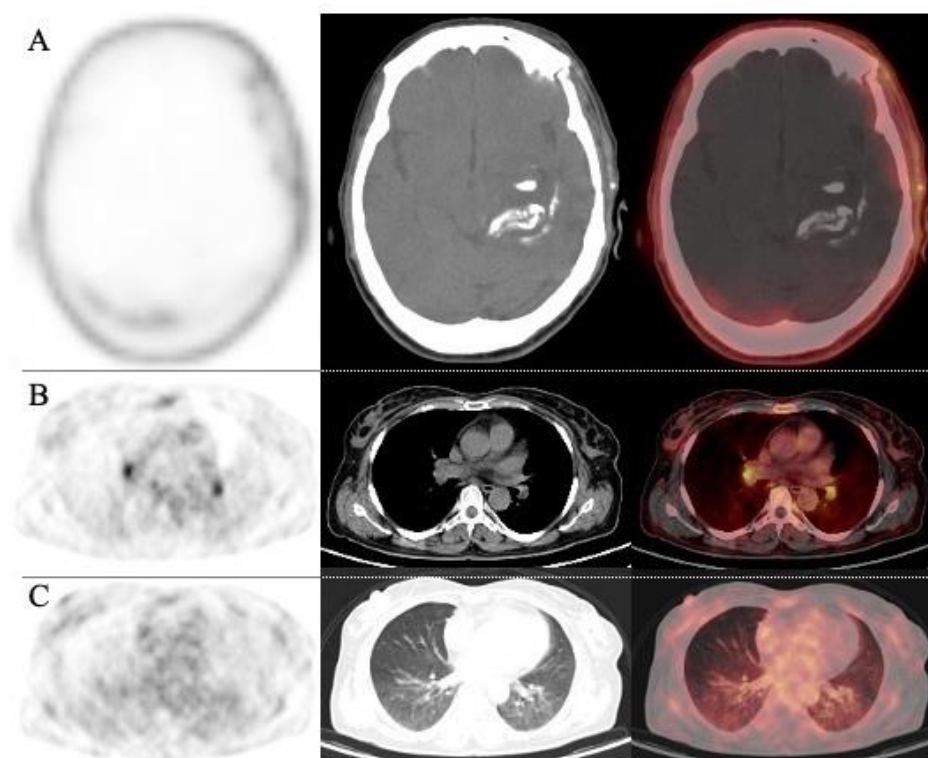


Fig 1. [⁶⁸Ga]Ga-Pentixafor PET/CT; A) Brain, No evidence of tumoral remnant, B) Pentixafor uptake (SUVmax 3.42) evident in the mediastinum corresponding to hilar lymph nodes, C) Mild diffuse uptake (SUVmax up to 2.60) in the basal and peripheral zones of both lungs with ground glass opacities (GGO) and consolidations

The acquisition was continued in whole-body mode (less head) regarding study design (Figure 2A). Of note, the patient experienced COVID-19 infection with a positive PCR ~4 weeks before the scan. Interestingly, two foci of increased CXCR4 uptake (SUVmax up to 3.42) were evident in the mediastinum corresponding to hilar lymph nodes (Figure 1B and Figure 2C). Furthermore, mild diffuse

uptake (SUVmax up to 2.60) was scattered in both lungs prominently in the basal and peripheral zones with ground glass opacities (GGO) and consolidations in the CT component of the study (Figure 1C and Figure 2B) corresponding to the acquired lung HRCT outside the facility, lately (Figure 3).

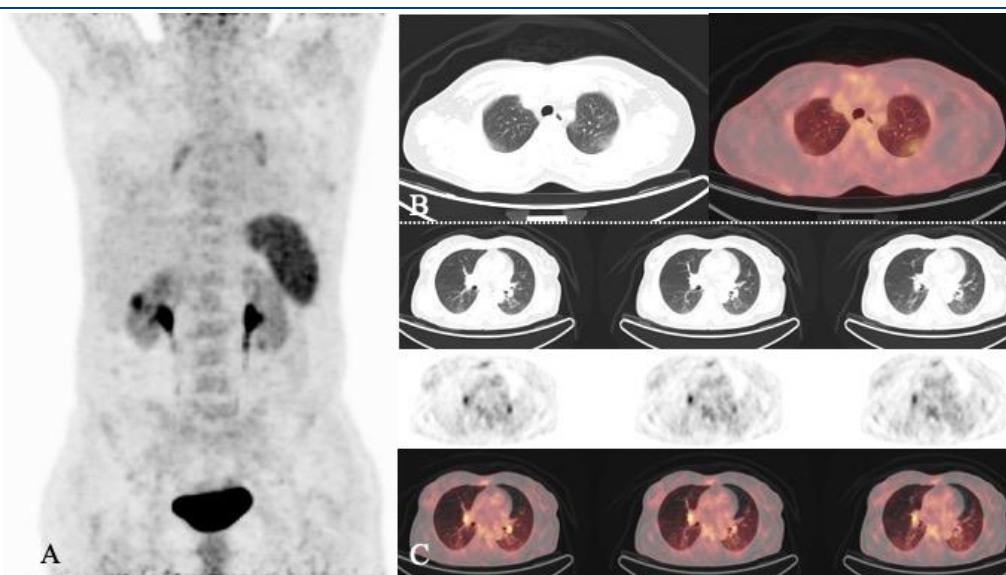


Fig 2. [⁶⁸Ga]Ga-Pentixafor PET/CT; A) MIP, B) an example of GGO avid [⁶⁸Ga]Ga-Pentixafor in the periphery of the left Apico-posterior segments of the upper lobe. C) Three consecutive PET/CT slices showing bilateral hilar lymph nodes with Pentixafor avidity

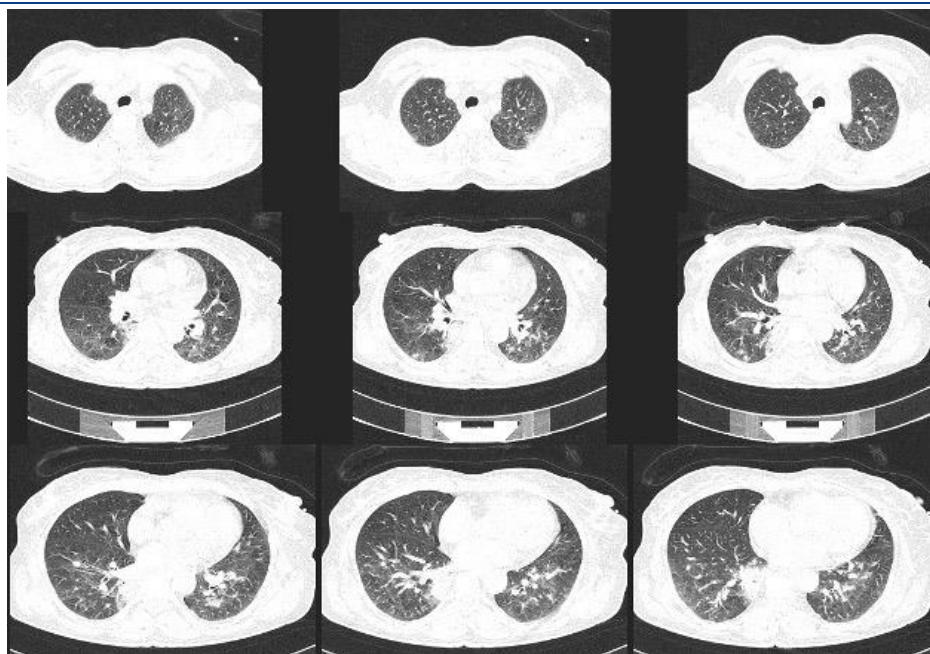


Fig 3. Lung HRCT slices depicted scattered ground-glass opacities (GGO) and consolidations at different levels which confirm the COVID involvement pattern

CONCLUSION

Mild diffuse uptake in the basal and peripheral zones of both lungs corresponding to GGO and consolidations which are of the most common patterns of COVID-19 lung involvement [5]. It is known that inflammatory monocytes overexpress CXCR4 during COVID-19 infection [6, 7]. Although Pentixafor-avid GGOs are previously reported in cryptococcal infection [8], to the best of our knowledge, it is not yet reported in COVID-19 lung involvement.

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