



Sarcoid-like Reaction Detected by ¹⁸F-FDG PET/CT in a Patient with Gastrointestinal Stromal Tumor (GIST) Post-Therapy with Multi-Targeted Receptor Tyrosine Kinase (RTK) Inhibitor Sunitinib

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Abstract

A 52 years old male patient, with a history of Gastrointestinal Stromal Tumor (GIST) in the small intestines with metastasis to the liver and peritoneum, with pathology showing mutation type Exon-11. The patient underwent ¹⁸F-FDG PET/CT scan that showed lesions with moderate FDG uptake. The patient was given Sunitinib 50 mg p.os and a ¹⁸F-FDG PET/CT scan performed two weeks later showed marked reduced FDG uptake in all lesions. However, due to side effects, Sunitinib was first discontinued and then restarted after three weeks with 25 mg (half dose). A follow-up ¹⁸F-FDG PET/CT scan three months later showed stable disease but high FDG uptake in multiple cervical, axillary and mediastinal lymph nodes.

Keywords: Sarcoid; FDG PET/CT; GIST; RTK; Sunitinib

Case Presentation

Whole-body ¹⁸F-FDG PET/CT imaging was performed 60 min after an intravenous injection of 5 MBq/kg ¹⁸F-FDG using a hybrid PET/CT scanner (Siemens Biograph 64 CT, Erlangen, Germany). Maximum Intensity Projection (MIP) of the same patient representing baseline and first follow-up post treatment, respectively, showing no lymph nodes enlargement or FDG uptake in the cervical, axillary or hilar regions (Figure 1A and 1B). Post-treatment second follow-up Coronal PET image showing FDG avid lymph nodes (sarcoid-like reaction) in the cervical, axillary and hilar regions (red arrows) (Figure 1C).

Post-treatment second follow-up coronal fused image showing sarcoid-like reaction in the cervical and axillary regions (green arrows) (Figure 2A), Axial Fused and PET images showing FDG avid axillary lymph nodes diagnosed as sarcoid-like reaction (green and red arrows) (Figure 2B and 2C).

Baseline axial fused and PET images showing peritoneal lesions with sparse FDG avidity (SUVmax 2.4 g/ml) in the left lumbar region (green arrows) (Figure 3A and 3B), First follow-up axial fused and PET images showing marked reduction in size and FDG uptake of peritoneal lesions (yellow arrows) (Figure 3C and 3D).

Discussion

Gastrointestinal Stromal Tumor (GIST) is a commonly occurring mesenchymal mass that frequently arises in the intestinal tract. These tumors can range from an incidentally detected mass to highly aggressive sarcomas. Approximately 20% to 25% of all GISTs are overtly malignant, indicating the annual incidence of tumors with a malignant potential to be roughly 5 for every million cases reported [1,2]. Moreover, it is well known that these tumors express the cell surface receptor KIT, which possesses tyrosine kinase activity. It is this receptor that undergoes a gain-of-function mutation, leading to uncontrolled cellular proliferation [3,4]. Surgery is first-line treatment for patients with primary resectable GIST [5]. However, despite complete surgical resection, half of the patients will relapse within five years, and standard chemotherapy and radiotherapy is not effective

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Received Date: 23 Mar 2020

Accepted Date: 10 Apr 2020

Published Date: 13 Apr 2020

Citation:

Aly M, Rojulpote C, Kothekar E, Seierstad T, Revheim M-E. Sarcoid-like Reaction Detected by ¹⁸F-FDG PET/CT in a Patient with Gastrointestinal Stromal Tumor (GIST) Post-Therapy with Multi-Targeted Receptor Tyrosine Kinase (RTK) Inhibitor Sunitinib. Clin Oncol. 2020; 5: 1691.

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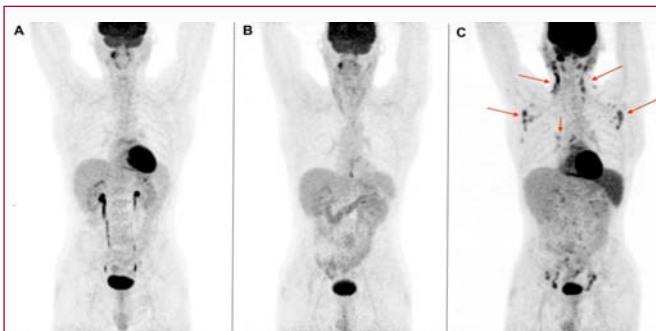


Figure 1: (A, B) Maximum Intensity Projection (MIP) of the same patient representing baseline and first follow-up post treatment, respectively, showing no lymph nodes enlargement or FDG uptake in the cervical, axillary, axillary or hilar regions. (C) Post-treatment second follow-up coronal PET image showing FDG avid lymph nodes (sarcoid-like reaction) in the cervical, axillary and hilar regions (red arrows).

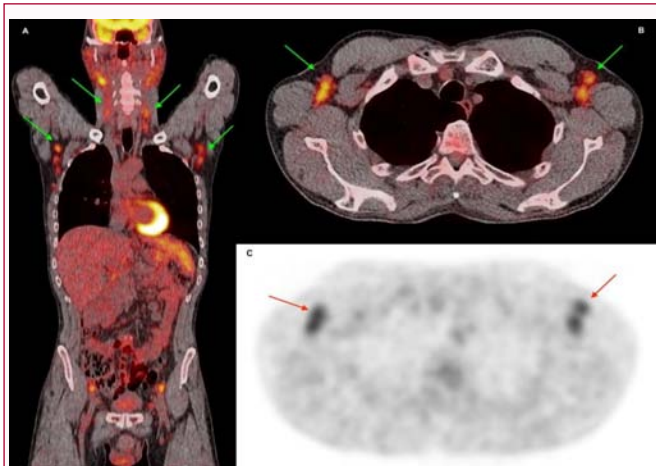


Figure 2: (A) Post-treatment second follow-up coronal fused image showing sarcoid-like reaction in the cervical and axillary regions (green arrows), (B, C) Axial Fused and PET images showing FDG avid axillary lymph nodes diagnosed as sarcoid-like reaction (green and red arrows).

[6,7]. In such scenarios, Tyrosine Kinase Inhibitor (TKI) such as Imatinib and Sunitinib may be employed to arrest the progression of the disease [8,9]. A study conducted by Demetri et al. [10] found that the median time to progression was 6.3 months in individuals who received Sunitinib as compared to 1.5 months in those who received placebo after failing Imatinib. However, as observed in our case, the use of signal inhibitors such as TKIs in malignancy can result in the occurrence of an entity known as Sarcoid like Reaction (SLR). SLR mimics sarcoidosis in that it appears hypermetabolic on ^{18}F -FDG PET/CT but does not meet the criteria for idiopathic sarcoidosis. A noteworthy point is the distribution of the nodal reaction observed in SLR. It typically presents bilaterally and may be localized or generalized. Localized SLR is confined to the site of the primary tumor whereas a generalized form is found primarily in distant sites (i.e., cervical, axillary and hilar nodes of our case). When dealing with such a case, ^{18}F -FDG PET/CT is a useful modality as it can detect sites of active inflammation as well as provide information regarding the extent of the disease, thus dictating treatment [11].

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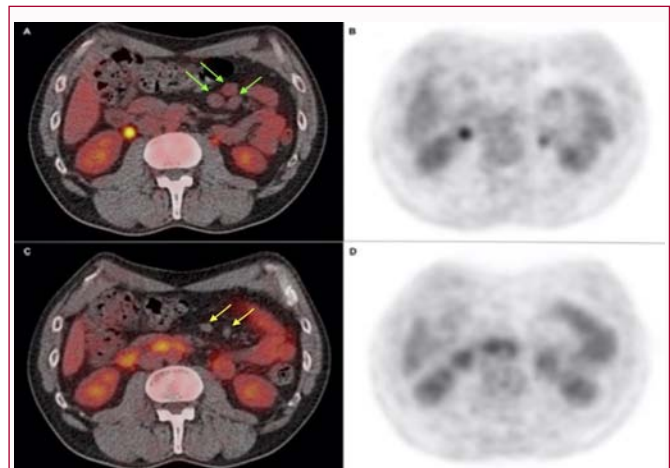


Figure 3: (A, B) Baseline axial fused and PET images showing peritoneal lesions with sparse FDG avidity (SUVmax 2.4 g/ml) in the left lumbar region (green arrows), (C, D) First follow-up axial fused and PET images showing marked reduction in size and FDG uptake of peritoneal lesions (yellow arrows).

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