

## Extramedullary Infiltration in Multiple Organs in a Relapsed Case of Acute Lymphoblastic Leukemia on $^{18}\text{F}$ -Fluorodeoxyglucose Positron Emission Tomography

### Abstract

T-cell acute lymphoblastic leukemia (ALL) is hematological malignancy with a propensity to involve extramedullary organs. We present the case of a 7-year-old child who was diagnosed with disease free from ALL for 1 year and then developed fever.  $^{18}\text{F}$ -fluorodeoxyglucose positron emission tomography/computed tomography revealed extramedullary infiltration of ALL in lungs, pancreas, kidneys, bone, muscles, and subcutaneous tissues.

**Keywords:** Acute lymphoblastic leukemia, extramedullary, fluorodeoxyglucose, positron emission tomography/computed tomography

A 7-year-old male child who has been diagnosed disease free from acute lymphoblastic leukemia (ALL) for the past 1 year presented with a history of fever for 3 weeks to medicine outpatient department. He was started on oral antibiotics for 1 month, which was upgraded to a higher dose following the persistence of fever. On suspicion of disease relapse,  $^{18}\text{F}$ -fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET-CT) was advised by the referring physician.  $^{18}\text{F}$ -FDG PET-CT findings revealed subcentimetric parenchymal nodules in the bilateral lung fields [Figure 1a-e, solid black arrows] in addition to paratracheal and paraesophageal lymph nodes. Also seen were focal FDG uptake in the left 10<sup>th</sup> rib [Figure 1f and g], FDG avid hypodense lesions in the tail and head of the pancreas [Figure 2a-d], and bilateral enlarged kidneys with diffuse increased homogenous FDG uptake (>liver) with multiple interspersed focal areas of intense FDG uptake in the bilateral renal parenchyma [Figure 2e and f]. FDG avid hepatic subcapsular [Figure 3a and b] and subcutaneous deposit in the left posterior lumbar region [Figure 3c and d] with hypodense lesion showing FDG uptake seen in the right gluteus maximus

muscle [Figure 3e and f] were also seen. Histopathology from the subcutaneous deposit in the left posterior lumbar region revealed lymphoblastic cell infiltration.

Extramedullary acute leukemia lesions occur at an anatomical location other than bone marrow, which is considered to be an uncommon presentation of acute leukemia, with the most common sites being central nervous system, mediastinum, liver, lung, kidney, and testicle.<sup>[1,2]</sup> Concurrent and isolated extramedullary infiltration of rare sites such as liver, pancreas, kidneys, bones, optic nerve, and stomach presenting in the initial stage and relapse of ALL with utility of  $^{18}\text{F}$ -FDG PET-CT in unmasking and accurately localizing these lesions have been previously described in the literature.<sup>[3-8]</sup> Authors through this case want to underscore the significance of  $^{18}\text{F}$ -FDG PET-CT in the restaging of cases of ALL where it can be aptly utilized to localize the extramedullary infiltration of rare sites as described above in a scenario of clinical dilemma.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given

Sarthak Tripathy,  
Sreedharan  
Thankarajan Arun  
Raj,  
Sneha Prakash,  
Sambit Sagar,  
Geetanjali Arora,  
Shamim Ahmed  
Shamim

Department of Nuclear  
Medicine and PET-CT, All India  
Institute of Medical Sciences,  
New Delhi, India

### Address for correspondence:

Dr. Shamim Ahmed Shamim,  
Department of Nuclear  
Medicine and PET-CT, All India  
Institute of Medical Sciences,  
New Delhi - 110 029, India.  
E-mail: sashamim2002@yahoo.  
co.in

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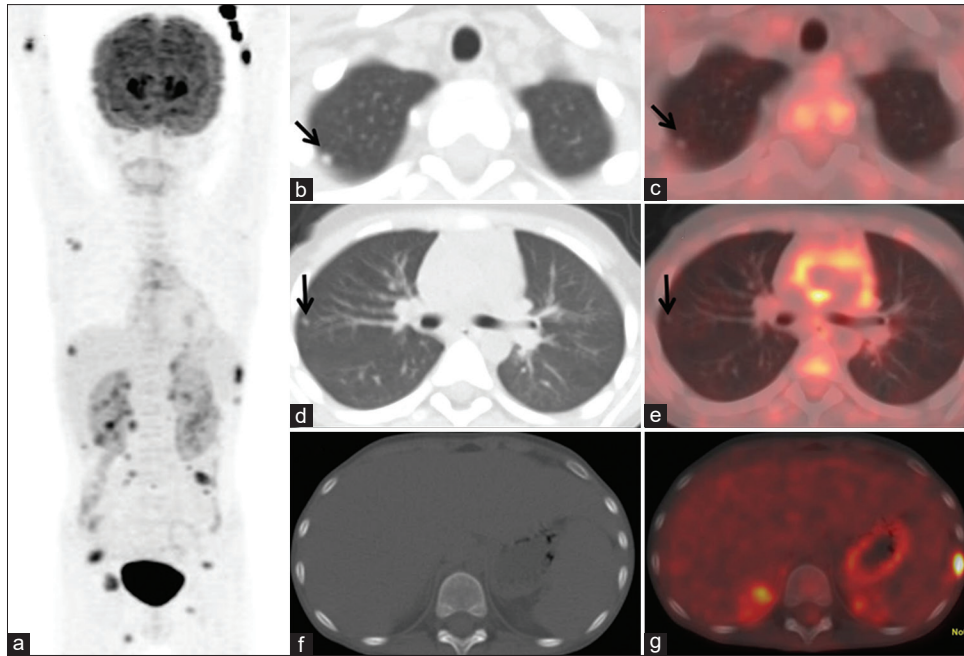


Figure 1: (a) Maximum intensity projection image of fluorodeoxyglucose positron emission tomography-computed tomography scan showing multiple focal areas of fluorodeoxyglucose uptake in the right axillary, abdomen, and pelvic region. (b and d) Axial computed tomography chest section showing subcentimetric nodule in the posterior segment of the right upper lobe showing mild fluorodeoxyglucose uptake in fused positron emission tomography-computed tomography image (c and e). (f) Axial computed tomography section showing subtle sclerotic changes in the left 10<sup>th</sup> rib showing intense fluorodeoxyglucose uptake in the fused positron emission tomography-computed tomography image (g)

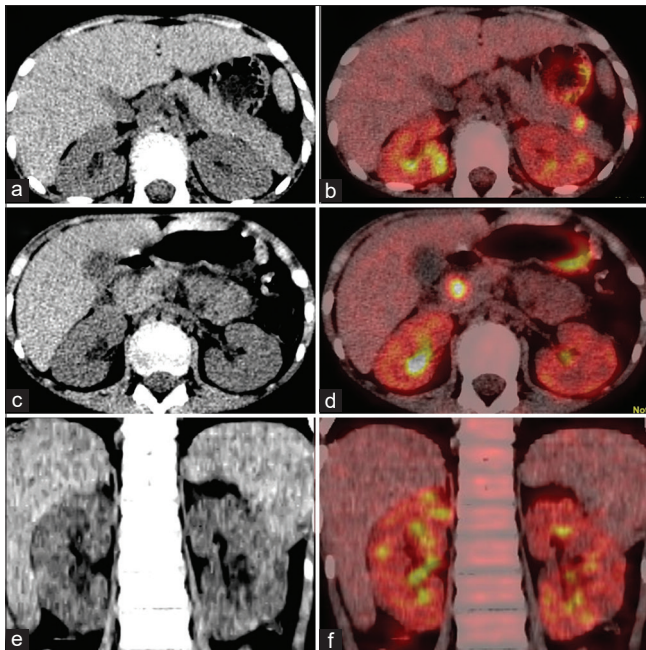


Figure 2: (a) Axial computed tomography abdomen image showing a hypodense lesion in the tail of pancreas showing intense fluorodeoxyglucose uptake in the fused positron emission tomography-computed tomography image (b). (c) Axial computed tomography abdomen image showing a hypodense lesion in the head of the pancreas showing intense fluorodeoxyglucose uptake in the fused positron emission tomography-computed tomography image (d). (e) Coronal computed tomography image showing bilateral enlarged kidneys showing increased fluorodeoxyglucose uptake (>liver) in the fused positron emission tomography-computed tomography image (f)

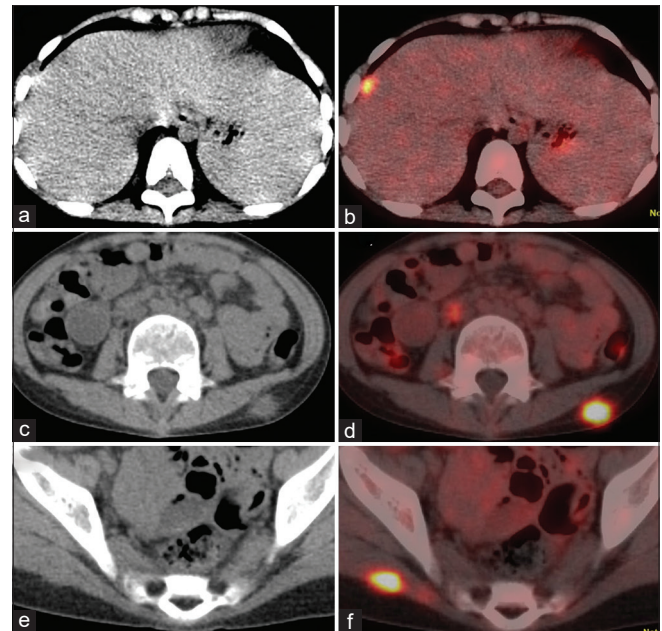


Figure 3: (a) Axial computed tomography abdomen image showing subcapsular hepatic deposit showing increased fluorodeoxyglucose uptake in the fused positron emission tomography-computed tomography image (b). (c) Axial computed tomography lower abdomen showing subcutaneous deposit in the left posterior lumbar region showing increased fluorodeoxyglucose uptake in the fused positron emission tomography image (d). (e) Axial computed tomography pelvis showing a hypodense lesion in the right gluteus maximus muscle showing increased fluorodeoxyglucose uptake in the fused positron emission tomography-computed tomography image (f)

his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

#### Conflicts of interest

There are no conflicts of interest.

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