

## The crying child; physiological variant on F18-FDG PET-CT in a patient of langerhans cell histiocytosis

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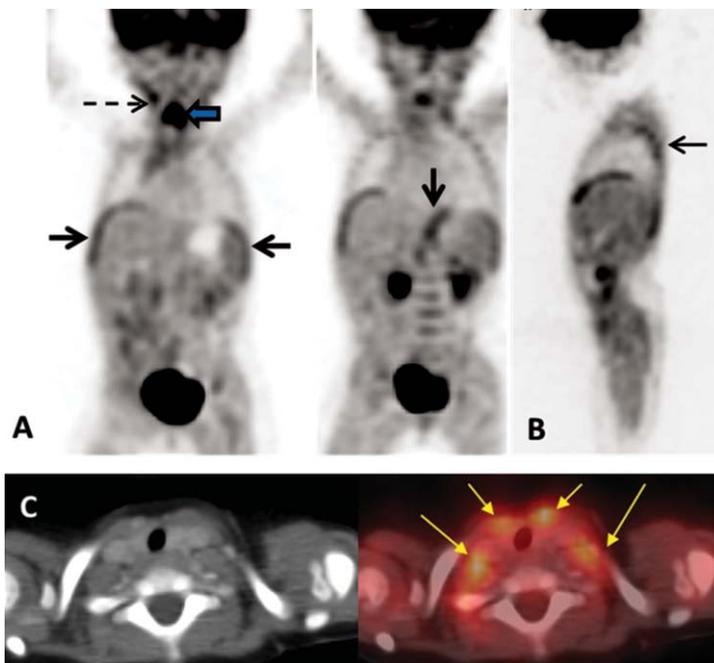
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### Abstract

F18-FDG PET-CT (Fluorodeoxyglucose Positron Emission Computed Tomography) scanning has a proven role in the staging of various cancers; the physiological distribution of F18-FDG must be understood thoroughly in order to improve the accuracy of image interpretation. We describe the case of a 2 year old child with Langerhans cell histiocytosis, who cried at the time of cannulation before undergoing F18-FDG PET-CT scanning.

**Keywords:** Langerhans cell histiocytosis, Crying child, F-18 FDG PET-CT, Diaphragmatic uptake.



A 2-year-old child, newly diagnosed Langerhans cell histiocytosis on cervical node biopsy, underwent a staging PET-CT scan. **(A)** Coronal and **(B)** Sagittal F18-FDG PET images demonstrate curvilinear symmetrical increased activity along the diaphragm and its crura (thick arrow), representing muscular diaphragmatic uptake and increased uptake in subcostal spaces (thin arrow). Corresponding CT images show no underlying structural abnormality. Focal activity in right neck is at the site of disease (dashed arrow). Midline focal activity is within the vocal cords (blue arrow). **(C)** Axial CT and fusion PET-CT images of the supraclavicular region demonstrate bilateral increased muscular uptake (yellow arrows). Structurally normal diaphragmatic crura, sternocleidomastoid and scalene muscles confirm uptake due to excessive crying at the time of cannulation.

Normally, little F18-FDG accumulates within the skeletal muscles. Muscular FDG uptake can be physiological or pathological. Non-pathologic competitive causes of uptake which may lead to false positive findings include, but are not limited to repetitive activity, use of muscles, walking, talking, coughing or weight lifting etc.<sup>1</sup> Diffuse muscular uptake throughout the body may occur due to increased

insulin levels in diabetics or after food intake. The level of FDG uptake is based on degree of intracellular glucose transfer.<sup>2</sup> Awareness of physiological F18-FDG uptake patterns is cardinal for the interpreting physician to avoid false-positive reporting. Cannulation in paediatric patients is always challenging due to difficult venous access and lack of cooperation. Painful cannulation in paediatric group may lead to crying and hyperventilation in patients resulting into increased FDG activity in vocal cords and accessory muscles of respiration.<sup>3</sup> Similarly; uptake due to brown fat activation is also well documented and can at times cause diagnostic challenges when reporting PET-CT scan.<sup>4</sup> With contrast enhanced correlative CT imaging, identification of structures corresponding to FDG uptake is easier. It is important to ensure that uptake period is spent in a comfortable, quiet surrounding with detailed instructions to the patient about minimizing activity and increasing relaxation during this time period.

### References

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