

⁶⁸Ga-Tetraazacyclododecane Tetraacetic Acid-DPhe1-Tyr3-Octreotate Positron Emission Tomography/Computed Tomographic Findings of Large-Cell Neuroendocrine Carcinoma of the Lung in a Child

Abstract

Primary lung cancers in children are rare, and most children are diagnosed incidentally while being investigated for another medical problem. The diagnosis of primary lung tumors in children is very difficult because many children are asymptomatic until the advanced stages of the disease and nonspecific imaging findings. Although the usage of ⁶⁸Ga-tetraazacyclododecane tetraacetic acid-DPhe1-Tyr3-octreotate (⁶⁸Ga-DOTATATE) positron emission tomography/computed tomography (PET/CT) in adult patients is well known, it is a relatively new imaging modality for the pediatric patient group. Herein, we presented a unique case of large-cell neuroendocrine carcinoma of the lung in a child on ⁶⁸Ga-DOTATATE PET/CT.

Keywords: Child, large-cell neuroendocrine carcinoma, positron emission tomography/computed tomography, tetraazacyclododecane tetraacetic acid-DPhe1-Tyr3-octreotate

An 8-year-old boy presented with pain in his left foot for a month. Plain radiography of the foot showed a lytic lesion in the distal part of the left fibula. A biopsy was taken from the lesion and histopathology revealed metastasis of large-cell neuroendocrine carcinoma with a high Ki-67 proliferation index (80%). Subsequently, the patient was referred to ⁶⁸Ga-tetraazacyclododecane tetraacetic acid-DPhe1-Tyr3-octreotate (⁶⁸Ga-DOTATATE) positron emission tomography/computed tomography (PET/CT) for investigating primary lesion. ⁶⁸Ga-DOTATATE PET/CT demonstrated tracer avid mass in the posterior segment of the right upper lung [Figure 1b: Axial PET/CT image]. ⁶⁸Ga-DOTATATE PET/CT also depicted multiple metastatic lymph nodes in the mediastinum and metastatic lytic lesions in the occipital bone, proximal part of left humerus, multiple vertebrae, pelvic bones, distal part of right femur, proximal part of right tibia, and distal part of left fibula [Figure 1a: MIP image; Figure 1c-g: Axial PET/CT image]. Based on the imaging and pathological findings, the patient was diagnosed with large-cell neuroendocrine carcinoma of the lung. Primary lung tumors in children are very rare, and most of the lesions in the lung

are metastatic disease. Neuroendocrine tumors constitute the majority of primary lung tumors in children.^[1-3] Neuroendocrine tumors are epithelial neoplasms that are divided into four subtypes: typical carcinoid, atypical carcinoid, large-cell neuroendocrine carcinoma, and small-cell lung carcinoma. Large-cell neuroendocrine carcinoma is the rarest subtype of primary lung cancer in children.^[4] Detection of primary pulmonary tumors in children is very difficult. Clinical and imaging findings are often confused with benign conditions, such as atelectasis and consolidation. Moreover, many children are asymptomatic until the advanced stages of the disease.^[5] Although the utility of ⁶⁸Ga-DOTATATE PET/CT in neuroendocrine tumors of the lung in adult patients is well known, there are very little data on the usage of ⁶⁸Ga-DOTATATE PET/CT in the pediatric patient group, since neuroendocrine tumors of the lung are very rare in children.^[6-8] Furthermore, ⁶⁸Ga-DOTATATE PET/CT findings of large-cell neuroendocrine carcinoma of the lung in a child have not been reported yet. This unique case of large-cell neuroendocrine carcinoma of the lung in a child demonstrates the value of ⁶⁸Ga-DOTATATE PET/CT in the pediatric patient group.

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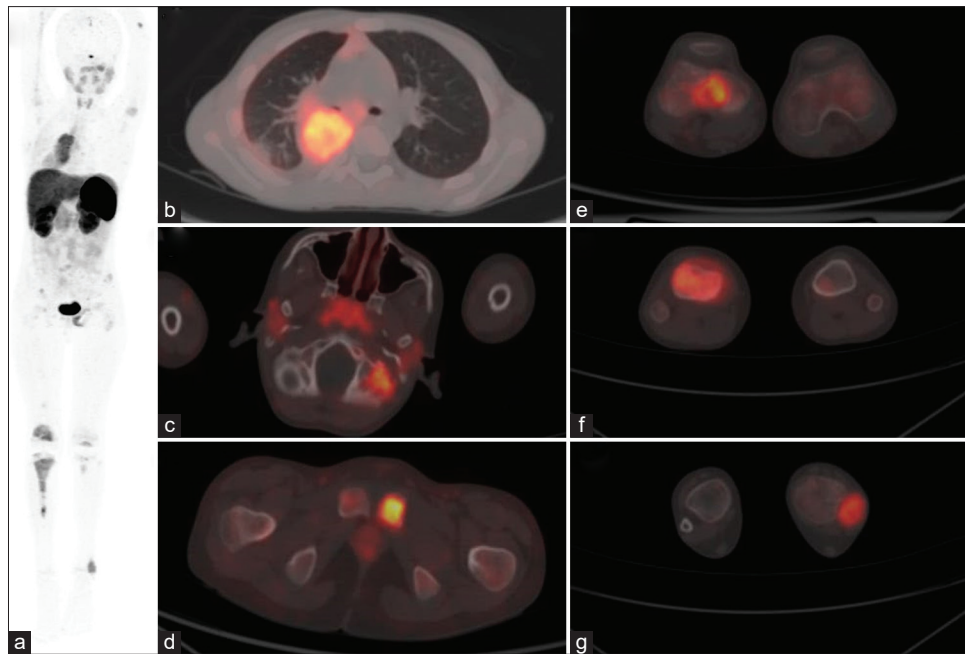


Figure 1: A tracer avid mass in the posterior segment of the right upper lung was seen on axial PET/CT image (b). Multiple metastatic lytic lesions (a) in the occipital bone (c), proximal part of left humerus, multiple vertebrae, pelvic bones (d), distal part of right femur (e), proximal part of right tibia (f), and distal part of left fibula (g) were observed on axial PET/CT images

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that names and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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