

Usefulness of ^{18}F -FDG-PET/CT in Evaluating a Brainstem Glioma in an Adult Patient with Neurofibromatosis Type 1

Giorgio Treglia · Barbara Muoio · Annemilia Del Ciello · Francesco Bertagna

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We describe a case of a brainstem glioma (BSG) occurred in an adult patient with neurofibromatosis type 1 (NF1) and evaluated by Fluorine-18-Fluorodeoxyglucose-positron emission tomography/computed tomography (^{18}F -FDG-PET/CT). A 32-year-old male patient with NF1 underwent brain magnetic resonance imaging (MRI) for the onset of diplopia, facial paresis and cerebellar signs and symptoms. MRI showed a brainstem lesion compatible with BSG. Biopsy was not performed. ^{18}F -FDG-PET/CT demonstrated intense ^{18}F -FDG uptake in the brainstem lesion, suggesting an aggressive neoplasm. The patient was referred to radiotherapy but he developed rapid disease progression. In this case, ^{18}F -FDG-PET/CT provided useful information about this rare NF1-associated tumor (Figs. 1 and 2).

Subsequently, the patient was referred to radiotherapy, but he developed rapid disease progression and died 3 months later. NF-1 is an autosomal dominant disorder characterized by multiple café-au-lait spots, axillary and inguinal freckling, multiple cutaneous neurofibromas,

and iris Lisch nodules [1]. NF-1 is also characterized by low-grade tumors of the central and peripheral nervous system. There is also an increased risk of developing malignant tumors such as malignant peripheral nerve sheath tumors or central nervous system high-grade

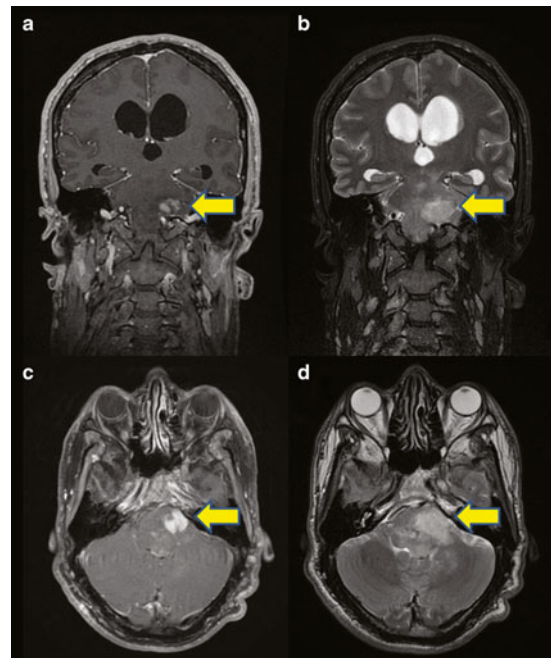


Fig. 1 We report the case of a 32-year-old male patient with neurofibromatosis type 1 (NF1) affected by a brainstem glioma (BSG). The patient underwent brain magnetic resonance imaging (MRI) for the onset of diplopia, facial paresis and cerebellar signs and symptoms. Coronal (a, b) and axial (c, d) enhanced T1-weighted (a, c) and T2-weighted (b, d) MR images showed the presence of a pontine-based infiltrative lesion (arrows), which presented inhomogenous signal intensity on both T1-weighted and T2-weighted images for the coexistence of isointense and hyperintense areas. These MRI findings were suggestive of a BSG

G. Treglia (✉)
Department of Nuclear Medicine and PET/CT Centre,
Oncology Institute of Southern Switzerland, Via Ospedale, 12,
6500 Bellinzona, Switzerland
e-mail: giorgiomednuc@libero.it

B. Muoio
School of Medicine, Catholic University of the Sacred Heart,
Rome, Italy

A. Del Ciello
Institute of Radiology, Catholic University of the Sacred Heart,
Rome, Italy

F. Bertagna
Department of Nuclear Medicine, University of Brescia, Brescia,
Italy

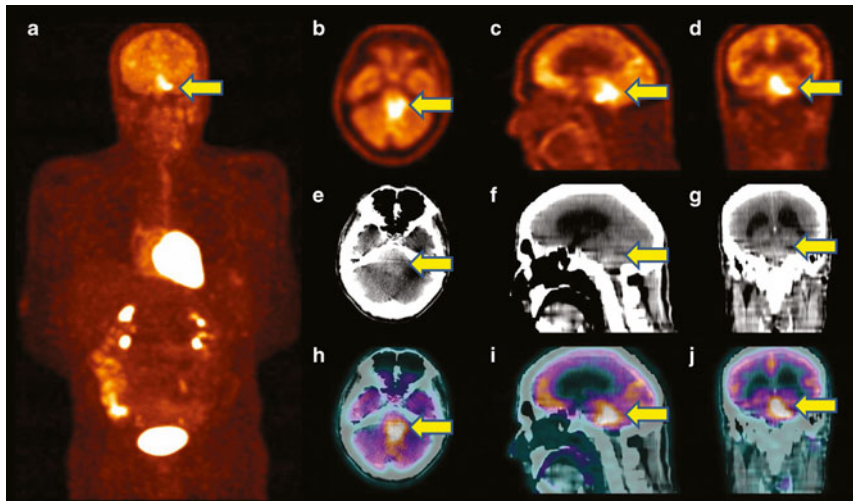


Fig. 2 The biopsy of the lesion was not performed and the patient underwent ^{18}F -FDG-PET/CT for the metabolic characterization of this brainstem lesion. Before ^{18}F -FDG injection, the patient had fasted for at least 6 h; at the time of the radiopharmaceutical injection, the patient presented glucose blood levels corresponding to 99 mg/dL. Images were acquired 1 h after intravenous injection of 280 MBq of ^{18}F -FDG according to the body mass index. The unenhanced CT scan was performed from the vertex to the inguinal region with a voltage of 120 keV and tube current of 30 mA. This scan was used for the anatomic localization and the attenuation correction of PET data.

PET scan was acquired in 3D mode (multiple bed positions, 3 min for each bed position). Iterative reconstruction and CT-based attenuation correction were used. Whole-body maximum intensity projection (MIP) ^{18}F -FDG-PET image (a) showed an area of intense ^{18}F -FDG uptake in the brainstem (arrow). ^{18}F -FDG-PET (b–d), unenhanced CT (e–g) and fused PET/CT images (h–j), in axial (b, e, h), sagittal (c, f, i) and coronal (d, g, j) projection showed increased radiopharmaceutical uptake corresponding to the known brainstem lesion, with a maximal standardized uptake value of 10.7, suggesting the presence of an aggressive neoplasm

gliomas [1, 2]. NF1-associated BSGs are less common than NF1-associated optic gliomas (OGs) and seem to represent a particular entity which tend, as a whole, to have a more favorable prognosis and a more indolent course than BSGs in patients without NF1 [3–5]; nevertheless, some NF1-associated BSG may rapidly progress [4]. ^{18}F -FDG-PET/CT has demonstrated to provide useful information to the surveillance of OGs in children with NF1, particularly to identify progressive, symptomatic tumors [6–8]. To the best of our knowledge, there are no data about the usefulness of ^{18}F -FDG-PET/CT in adult patients with NF1-associated BSG. In our case, ^{18}F -FDG-PET/CT has been useful in evaluating this rare NF1-associated tumor.

Conflicts of interest None.

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