Interesting image

18F FDG PET/CT in a child with gliomatosis cerebri

18F FDG PET/TC en un niño con Gliomatosis Cerebri

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A R T I C L E   I N F O

Article history:
Received 21 April 2012
Accepted 31 August 2012
Available online 31 October 2012

18-Fluoro-2-deoxyglucose (18F-FDG) positron emission tomography/computed tomography (PET/CT) findings were presented in a 5-year-old boy who was considered to have gliomatosis cerebri with magnetic resonance imaging (MRI) showing multiple lesions in his brain. The boy was referred to nuclear medicine department in order to evaluate the tumor metabolism and define the optimal site of the tumor for biopsy with the 18F-FDG PET/TC (Fig. 1) and evaluate the therapy response six months after therapy (Fig. 2). The boy had gait disturbance, facial asymmetry, and difficulty of closing the left eyelid and strabismus in the first application. In the boy’s clinical record, previous MRI showed multifocal lesions in the posterior fossa, brain stem, pons, mesencephalon, bilateral thalamus and the left caudate nucleus with the presumptive diagnosis of acute disseminated encephalomyelitis (ADEM). With the progressve clinical course and the new findings in the following brain MRI, presumptive radiologic diagnosis was gliomatosis cerebri.

Intense increased 18F-FDG uptake around the anterior horn of the left lateral ventricle is shown in axial CT (A), PET (B) and PET/CT fusion (C) images. Cerebral T2 weighted axial image of the more superior part shows enlarged nodular mass protruding into the left lateral ventricle. Increased dilatation of the ventricle system is seen as well (D). The 18F-FDG PET/CT scan showed a hypermetabolic focus which was the guide for a surgeon to find optimal site for biopsy whereas MRI showed multifocal non-contrast enhancing lesions. Histopathological examination revealed gliomatosis cerebri, high-grade glial tumor (WHO, grade III). Primary surgery, radiotherapy and chemotherapy were planned. Tumor mass could have been excised only partially.

18F-FDG PET/CT scan showed multiple hypermetabolic foci and progression of the tumor which could not be documented in MRI. Intensely increased 18F-FDG uptake in the left basal ganglia and especially around the hematoma (arrow) is shown in axial CT (A), PET (B) and PET/CT fusion (C) images. There were also multiple hypermetabolic foci in the left temporal cortex, left basal ganglia and especially around of the hematoma. Cerebral T2 weighted image shows left intraventricular hemorrhagic mass, midline shift and bilateral white matter edema as increased T2 signal. There is a drainage catheter inserted in the right lateral ventricle. Bilateral subdural effusion is seen at the frontal regions (D). 18F-FDG PET/CT scan was evaluated as a progression of the tumor. There was no new lesion in post-treatment MRI when compared to MRI obtained before therapy, but just intraventricular hemorrhagia and bilateral white matter edema were reported in post treatment MRI.

18F-FDG PET has been reported as a useful method to evaluate metabolism of brain tumours and the degree of aggressiveness of the tumour. It is also well known that the most effective area for 18F-FDG using in brain tumors is distinguishing recurrent or residual tumors after therapy. The findings of the 18F-FDG PET/CT scan might also help the clinician to predict the outcomes and

Fig. 1. Intensely increased 18F-FDG uptake around the anterior horn of the left lateral ventricle is shown in axial CT (A), PET (B) and PET/CT fusion (C) images. Cerebral T2 weighted axial image of the more superior part shows enlarged nodular mass protruding into the left lateral ventricle (D).

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http://dx.doi.org/10.1016/j.remn.2012.08.005
In this particular case, $^{18}$F-FDG PET/CT scan added very valuable diagnostic information to the MRI in terms of guidance of biopsy site and documenting progressive disease after the therapy. Unfortunately, the child died with progression of disease at the 10th month of oncologic diagnosis.

References


Fig. 2. Intensely increased $^{18}$F-FDG uptake in the left basal ganglia and especially around of the hematoma (arrow) is shown in axial CT (A), PET (B) and PET/CT fusion (C) images. Cerebral T2 weighted image shows left intraventricular hemorrhagic mass, midline shift and bilateral white matter edema as increased T2 signal (D).