Clinical note

FDG PET/CT in monitoring treatment of retroperitoneal fibrosis

S. Yilmaz a,⁎, Y.Z. Tan b, M. Ozhan a, M. Halac a, S. Asa a, K. Sönmezoglu a

a Department of Nuclear Medicine, Cerrahpasa Medical Faculty, University of Istanbul, Istanbul, Turkey
b Göztepe Teaching Hospital, Department of Nuclear Medicine, Istanbul, Turkey

A R T I C L E   I N F O

Article history:
Received 6 February 2012
Accepted 1 April 2012
Available online 22 May 2012

Keywords:
Retroperitoneal fibrosis
FDG
PET/CT

A B S T R A C T

Retroperitoneal fibrosis (RPF) is an uncommon disease characterized by inflammatory fibrosis typically surrounding abdominal aorta and iliac arteries. The glucose analogue F18-fluorodeoxyglucose can be used to image inflammatory cell activity non-invasively by PET. In this report we investigated the usefulness of the FDG PET/CT in the disease activity and therapy response evaluation of retroperitoneal fibrosis.

⁎ Corresponding author.
E-mail address: sbr_yilmaz@yahoo.com (S. Yilmaz).

FDG PET/TAC para monitorizar el tratamiento de la fibrosis retroperitoneal

R E S U M E N

La fibrosis retroperitoneal es una enfermedad poco común caracterizada por fibrosis inflamatoria típicamente en el área de la aorta abdominal y las artérias ilíacas. El análogo de la glucosa F18-fluorodeoxyglucosa puede usarse para obtener imágenes de la actividad celular inflamatoria de manera no invasiva por PET. En este informe, estudiamos la utilidad de FDG PET/TAC en la evaluación de la actividad de la enfermedad y respuesta al tratamiento de la fibrosis retroperitoneal.

Case report

A 48-year-old man with retroperitoneal mass was admitted to urology department. An abdominal CT scan done prior to the PET study showed a mass with soft tissue density around paraaortic and right iliac artery. The patient showed an important reduction in the size of the retroperitoneal thickened mass at 12 months without any treatment. With clinical presentation and imaging findings the patient had the presumed diagnosis of RPF. Then, the patient was referred with a presumed diagnosis of RPF for PET/CT imaging for the metabolic characterization of the retroperitoneal mass. PET/CT images showed heterogeneously increased FDG uptake extending below the renal hilum and tracing along common iliac artery at the right and proximal common iliac artery at the left. There was no other pathological uptake in the body. The patient was treated.
with tamoxifen and follow-up PET/CT was done five months after pharmacotherapy. Post-treatment PET/CT demonstrated decrease in the tracer activity of the same lesion (Fig. 1).

Discussion

Typically, RPF typically surrounds the abdominal aorta and iliac arteries extending to neighboring structures, most commonly the ureters and inferior vena cava. Corticosteroids, with addition of immunosuppressant or tamoxifen in resistant cases have been used to treat RPF. In most cases, it can be diagnosed on the basis of radiological findings, especially CT, with identification of a retroperitoneal mass, the absence of other demonstrable renal or ureteric disease or any other pathology that could explain the findings. Prompt diagnosis of RPF can provide preserving renal function. There are additional fibrotic processes outside the retroperitoneum in up to 15% of patients. Medical treatment is often effective for RPF, but follow-up CT after medical treatment frequently shows some residual masses that may represent active disease or may simply be inactive fibrous tissue. The potential role of FDG PET in the assessment of inflammatory disease as in RPF has been reported. PET/CT is a useful adjunct to anatomic imaging and serum inflammatory markers in evaluating the inflammation degree in RPF, and in assessing the response to immunosuppressive therapy. Acute phase reactants like the erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) may be helpful in evaluating disease activity, and these parameters are frequently used to monitor the clinical course of RPF. However, these parameters are nonspecific and not very sensitive. Additionally, despite clinical response and reduction of acute phase reactants, soft tissue abnormalities often present on CT following treatment. Activity of the fibrotic process has a positive correlation with the degree of soft-tissue enhancement on CT. Avid contrast enhancement may be seen in the acute stages. Unfortunately, administration of IV contrast agents cannot be performed in many patients with renal impairment secondary to obstructive uropathy. In such cases, FDG PET may be of benefit in evaluating disease activity. The perivascular inflammation seen on PET/CT suggests the potential for FDG PET to act not only as a diagnostic adjunct to anatomical imaging but also to provide prognostic information regarding the degree of active inflammation and the potential for response to medical treatment. The patients who show FDG avidity could be placed on a trial of immunosuppressive or hormonotherapy and followed to assess the degree of disease regression. If, however, there was no FDG uptake, the patient might be referred for operative management earlier in the disease course and thus spared of potential complications of unnecessary treatment. FDG PET may have an important role in managing RPF by helping to discriminate active from inactive disease.

References


Fig. 1. Pre-treatment (A) and post-treatment (B) axial PET, axial CT, axial fusion, coronal fusion and MIP PET images. Pre-treatment images showed heterogeneously increased FDG uptake extending below the renal hilum to the aortic bifurcation and tracing along common iliac artery at the right and proximal common iliac artery at the left (lesion SUVmax: 9.9, liver SUVmax: 2.8). No other sites of abnormal FDG metabolism were noted. The patient was treated with tamoxifen and follow-up PET/CT done five months after pharmacotherapy demonstrated FDG avid lesion at the same region (lesion SUVmax: 6.8, liver SUVmax: 3.0). When compared to previous study, partial response to therapy (decrease in SUV is 31.3%) was noted.