Usefulness of ^{18}F -FDG PET/CT in Evaluating Disease Activity at Different Times in a Patient With Chronic Periaortitis

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We report the case of a 53-year-old man with a chronic periaortitis (CP) in whom Fluorine-18-Fluorodeoxyglucose (FDG) positron emission tomography/computed tomography (PET/CT) has been useful in assessing the disease extent at diagnosis, in evaluating the treatment response, in diagnosing the relapse, and in monitoring the disease activity during follow-up (Fig. 1). This case highlights the usefulness of FDG-PET/CT at different times in patients with CP.

CP is a rare inflammatory disorder that affects the abdominal aorta and the retroperitoneum [1–3]. Imaging procedures are essential to diagnose and monitor the disease course [1–3]. Ultrasonography may be used as first-line screening test, and is particularly useful to monitor patients with hydronephrosis and aortic aneurysms. However, CT or magnetic resonance imaging (MRI) of the abdomen are currently considered the investigations of choice to diagnose CP [1–3]. In active CP, the periaortic mass usually enhances

on CT and MRI. Both these methods can be used to monitor the disease course of CP and to evaluate response to treatment. A note of caution: signs of vasculitis seen on MRI and CT may persist for some time, despite achievement of clinical remission. A further limitation of abdominal CT and MRI is that neither technique can detect vasculitis in vessels other than the abdominal aorta, which has been described in 43 % of patients with CP [1].

FDG-PET/CT has been proposed as useful tool in inflammatory diseases, such as aortitis, because metabolic changes assessed by FDG-PET usually precede morphological changes assessed by conventional imaging methods [4–8]. Our case highlights the usefulness of FDG-PET/CT at different times in patients with CP. This method may be useful in assessing disease activity and extent at diagnosis, in evaluating the treatment response, in diagnosing the relapse, and in monitoring the disease during follow-up.

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Fig. 1 A 53-year-old man was admitted to our hospital for a suspected chronic periaortitis (CP) based on clinical (abdominal pain), laboratory data (increased serological inflammatory markers, such as erythrocyte sedimentation rate [ESR] and C reactive protein [CRP]), and imaging data (an abdominal periaortic tissue with a longitudinal extent of 7 cm was detected at CT). The patient did not perform a contrast enhanced CT scan for renal insufficiency. The patient underwent a FDG-PET/CT to assess the metabolic activity of the periaortic tissue. The maximum intensity projection (MIP) PET image (A1) showed increased uptake in the mesogastrium (*arrow*). Axial (A2) and coronal (A3) PET/CT images showed increased FDG uptake (SUVmax: 6.8) corresponding to an abdominal periaortic tissue (*arrows*) at co-registered CT images. Based on PET/CT findings suggesting a CP, the patient underwent immunosuppressive treatment with corticosteroids. After treatment, clinical relief with a mild reduction of ESR and CRP occurred. Five months after the initiation of immunosuppressive therapy, the patient underwent a second FDG-PET/CT to evaluate the treatment response. The MIP image of the post-treatment PET (B1) showed a decrease of the previously evident uptake in the mesogastrium (*arrow*). Axial (B2) and coronal (B3) PET/CT images showed a marked decrease of uptake

(SUVmax: 2.7) and size of the periaortic tissue previously described (*arrows*), suggesting a good treatment response. Five months after the post-treatment evaluation, the patient underwent a repeat FDG-PET/CT for a suspected relapse based on laboratory data (a significant increase of ESR and CRP occurred). The MIP image of the repeat PET (C1) showed increased uptake in the mesogastrium (*arrow*). Axial (C2) and coronal (C3) PET/CT images showed increased uptake (SUVmax: 5.6) at PET images corresponding to an abdominal periaortic tissue (*arrows*) at co-registered CT images, unchanged in size compared to the previous PET/CT scan. Overall, these findings suggested the presence of a relapse of CP. Therefore, the patient underwent a second-line immunosuppressive treatment with corticosteroids and azathioprine. Four months after the initiation of the second-line treatment, the patient showed only a mild decrease of ESR and CRP and underwent a new post-treatment evaluation using FDG-PET/CT. The MIP image of the post-treatment PET (D1) showed a decrease of uptake in the mesogastrium (*arrow*). Axial (D2) and coronal (D3) PET/CT images showed a marked decrease of uptake (SUVmax: 2.5) in the periaortic region (*arrows*), suggesting a good response to the second-line treatment

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