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Clinical note

Homeopathic mistletoe adverse reaction mimics nodal involvement in ^{18}F-FDG PET/CT performed for evaluation of response to chemotherapy in lymphoma

P. Abreu[a,*], R. Sánchez[b], T. Mut[a], D. Balaguer[a], I. Latorre[a], H. Rodríguez[a]

[a] Servicio de Medicina Nuclear, Hospital Universitario Dr. Peset, Valencia, Spain
[b] Servicio de Medicina Nuclear y PET/TC, Hospital 9 de Octubre, Valencia, Spain

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ABSTRACT

Some patients use complementary medicine. We present a patient with Hodgkin's lymphoma, scanned with ^{18}F-FDG PET/CT for evaluation of response after chemotherapy, who was self-administering mistletoe as a homeopathic medicine product.

The careful review of the images of the entire scan and patient collaboration in anamnesis were crucial to avoid a false positive result.

A review of the published scientific data on the effects of mistletoe is also presented.

Reacción adversa a muérdago homeopático que imita infiltración ganglionar en ^{18}F-FDG PET/TC realizada para valorar la respuesta a quimioterapia en linfoma

Palabras clave:
Linfoma
Evaluación de respuesta
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RESUMEN

Algunas personas usan terapias alternativas. Presentamos el caso de una paciente con enfermedad de Hodgkin a la que se realiza una ^{18}F-FDG PET/TC para evaluar la respuesta tras quimioterapia, en paciente que se autoadministraba muérdago como tratamiento homeopático.

La cuidadosa evaluación de todas las imágenes de la prueba y la colaboración de la paciente durante la anamnesis fueron cruciales para evitar un resultado falso positivo.

Además, se revisan los datos publicados sobre los efectos del muérdago.

Introduction

Complementary alternative medicine (CAM) is a group of therapies, health care or products that are not considered part of conventional medicine. In USA approximately 40% of adults are using some method of CAM, sometimes used together with conventional medicine. Some effects of this alternative medicine are not well known by physicians or its use is hidden by the patient.

^{18}F-FDG PET/CT is an effective diagnostic tool in Hodgkin's disease, which has been proved useful in staging, evaluation of response, follow-up and relapse.

Case report

We report the case of a 29 years old patient with Hodgkin's lymphoma (mixed cellularity subtype), stage II-A with bilateral supraclavicular and cervical involvement (Fig. 1). After treatment with 6 cycles of ABVD, she was referred for evaluation of response. A PET/CT performed 60 min after 9.65 mCi (357 MBq) of ^{18}F-FDG, showed the disappearance of the hypermetabolic lymph nodes evidenced in the study of staging, but with appearance of new lymphadenopathies intensely hypermetabolic in the left axillary region. The CT image also revealed the presence of fat rarefaction with mild left arm subcutaneous metabolic activity in the fusion PET/CT, not present in the contralateral arm, which made us suspect that there might be inflammatory disease associated (Figs. 2 and 3).

The patient told us that she was administering herself, since the initiation of treatment with chemotherapy, subcutaneous injections of mistletoe substitute, being as an adjuvant alternative therapy prescribed by a naturopath. The haematologist suggested to stop injecting herself and to repeat the PET/CT scan, performed 4.5 months later, showing disappearance of two of the lymph nodes and decreased metabolic rate in another two, with improvement of the signs of cellulitis in the arm (Fig. 4). A new PET/CT scan performed after 4 months, showed total disappearance of abnormal

* Corresponding author.
E-mail addresses: abreu_ped@hotmail.com, abreu_ped@gva.es (P. Abreu).

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Fig. 1. Lymphoma staging ^{18}F-FDG PET/CT coronal slice showing hypermetabolic bilateral supraclavicular nodal involvement (SUVmax left = 20.3 g/ml; SUVmax right = 14.3 g/ml). In both axillary regions there are ametabolic lymphatic ganglia without pathologic significance.

features. The patient is in complete remission after eight years of follow-up.

Mistletoe

Mistletoe is a semi-parasitic plant abundant in northern Europe that grows on the branches of trees. Always green and with white berries when ripe, in current days is known abroad by its relationship with Christmas. It was considered by the Druids as a magical plant, associated with fertility and with the power to cure all ills. Collected in the summer or winter solstice according to the desired properties, in a ritual in which they must seek permission from the

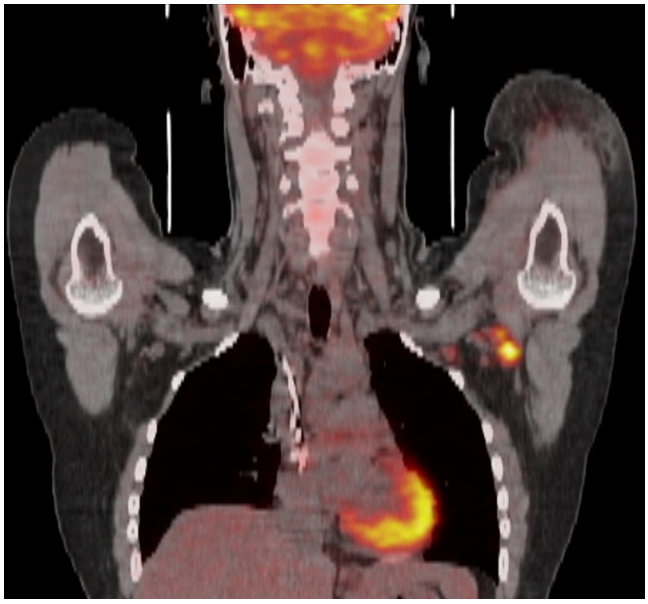

Fig. 2. After 2× ABVD PET/CT coronal slice shows that the known supraclavicular lesions have disappeared, but there is new abnormal metabolic activity in left axillary region (SUVmax = 4.5 g/ml). Note that there is abnormal fat rarefaction with mild ^{18}F-FDG activity (SUVmax = 1.9 g/ml) in left proximal arm.

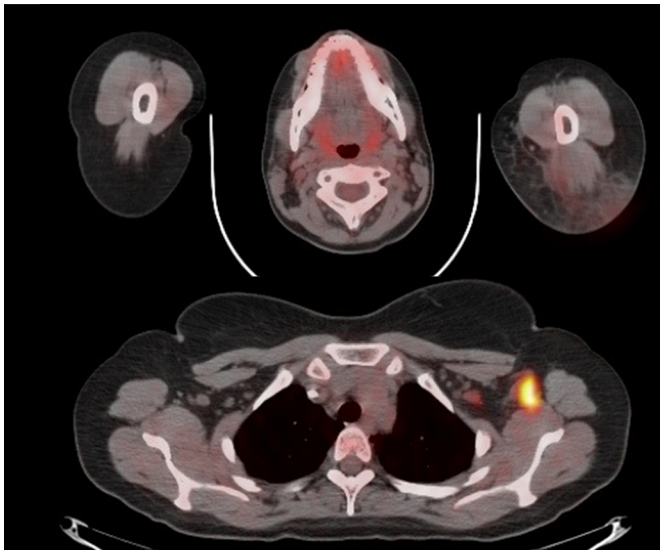

Fig. 3. Axial PET/CT images after 2× ABVD, showing fat rarefaction with mild ^{18}F-FDG activity in left proximal arm and intense hypermetabolic lymphadenopathies in left axillary region.

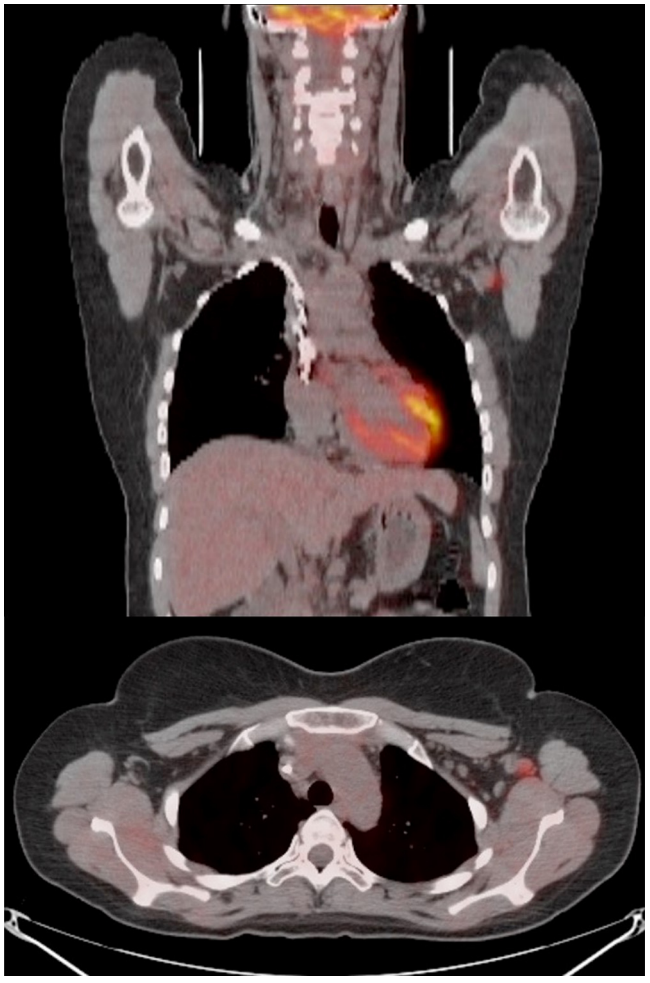

Fig. 4. Coronal and axial PET/CT after 4.5 months of withdraw mistletoe treatment shows improvement of cellulitis and decrased metabolic rate in axilar nodes (SUV max = 2.9 g/ml).

plant before cutting its branches with a golden sickle, being careful not to fall them to the ground. Even the Celts hung it on the door of their houses to ward off evil spirits and many others stories about the mistletoe goes it back to the old era of gods.

Several compounds with pharmacological properties have been found in the plant, among which we highlight Viscotoxin and Phoratoxin (producing bradyarrhythmia and decreasing myocardial contractility) and galactose-specific Lecithin I, which increases the immune response and release endorphins. From this later compound exists a purified derivative called R-Mistletoe. It is a protein with two subunits: the B subunit of 260 amino acids, responsible for binding to the cell membrane, and the A subunit of 249 amino acids, a specific N-glucosidase responsible for the inactivation of ribosome associated with type II cell apoptosis. Scientific articles have been published for the evaluation of therapeutic use of R-Mistletoe in various cancers and have shown an improvement in quality of life and prolonged disease-free interval in patients with breast cancer in stages II b, with analgesic effect and few adverse reactions secondary to cancer therapy, showing adverse skin reactions of mild-moderate intensity and self-limiting in 12.8% of patients,[1] but with a case of angioedema.[2] It has been reported that a dose of 15 ng/0.5 ml twice a week/15 weeks (associated with 4 cycles of CMF) is a safe procedure that results in improved quality of life and increased T-helper lymphocytes CD4+ and CD4/CD8 ratio.[3,4]

It also has been demonstrated various direct effects against cancer cells,[5–7] some of them leaving an additive antitumor effect in combination with ionizing radiation.[8–10] However, further studies are needed to assess their true role in cancer treatment.

Discussion

We present a case of ^{18}F-FDG PET/CT evaluation response to chemotherapy in lymphoma with inflammatory reaction by complementary alternative therapy. In PET/CT a lot of morphologic and functional information is managed and attention in reviewing all parts of the study (PET and CT) should be paid. Clinical history prior doing the PET/CT scan is essential in giving us the necessary information to minimize false positive results when reporting findings.

Year after year people using CAM increases and traditional doctors should know its effects in order to improve the management of their patients.

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The manuscript has not required funding.

Conflicts of interest

The authors declare no conflict of interest.

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