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18F-FDG-PET/CT in a patient with suspected recurrence of germ cell tumor

ABSTRACT

At present, the available clinical practice guidelines for the management of patients with germ cell tumor (GCT) assign to Positron Emission Tomography (PET) scan a role in the evaluation of the residual mass at the end of the treatment of advanced seminoma, while a possible role of this tool in the strategy of follow-up has not been defined yet.

We are presenting a case of a patient treated for a GCT with an increase of the marker levels during the follow-up where a PET/CT with 18F-FDG was the only noninvasive examination able to correctly identify the site of disease recurrence. This case shows how this tool could have a role, in addition to morphological examinations, in the management of patients with GCT during the follow-up.

KEY WORDS: FDG-PET/CT, germ cell tumor, recurrence, seminoma

INTRODUCTION

Germ cell tumor (GCT) of the testis is a relatively rare disease, as only 1% of men resulted affected; however, the percentage has increased in young population becoming the commonest tumor in men aged 15 to 35 years. [1-3]

These malignancies present a good overall prognosis; however, a significant more elevated risk of disease recurrence has been documented in patients with advanced GCT in complete remission after chemotherapy than patients in stage I. The follow-up strategy in this group of high-risk relapse patients depends on the histological examination, the sites of metastases, the prognostic group, and the treatment administered. Marker levels, chest radiograph, and abdomen/pelvis Computed Tomography (CT) are utilized for the surveillance.[1,4,5]

CASE REPORT

We report the case of a patient who was treated for an advanced GCT. The 30-year-old patient underwent a left orchifunicolectomy and first line chemotherapy for an embryonic carcinoma with areas of seminoma of the testis and both lymph node and lung metastases (pT1, N2, M1). One year after a complete response to the chemotherapy, the patient was again treated for a relapse of disease suspected by an increase of alpha-fetoprotein marker (aFP > 400 ng/ml) and confirmed by a biopsy of mediastinal lymph nodes. The patient obtained again a complete response to the treatment with a lasting stabilization of the marker values in a normal range. After 12 years, a further significant increase of the aFP (686 ng/ml) was observed; however, neither the chest radiograph, nor the CT scan with contrast enhancement were able to confirm this high suspicion of disease relapse. In particular, CT scan of abdomen and pelvis showed only a right retrocrural lymph node of 13-mm with uncertain pathological significance. Due to the deep site of the lymph node, a surgical approach was not recommended and thus, about three weeks after the dedicated CT, a total body Positron Emission Tomography/Computed Tomography (PET/CT) was performed. Patient was injected with a dose of 18F-FDG correlated with his weight (225.7 MBq) and the scan was performed 60 minutes after the radiotracer intravenous administration. PET images showed a significant abnormal focal accumulation of 18F-FDG, with a value of 6 of maximum Standardized Uptake Value (SUVmax), localized at the right retrocrural lymph node, confirming the site of relapse of disease and excluding other pathological localizations [Figure 1]. As a result of the high levels of the marker and the pathological PET finding, patient was treated with four cycles of chemotherapy. At the end of the chemotherapy, a PET/CT was repeated with the same scan and the same protocol acquisition. PET images showed at the right retrocrural lymph node a no more significant uptake of the radiotracer (SUVmax, 1.6) attributable to the presence of fibrotic residual tissue; at the CT image, it was still visible with a diameter of 10 mm [Figure 2]. The complete response was finally confirmed by the levels of
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serum αFP, which resulted in 7.8 ng/ml at the time of the second PET performed after the treatment, and values in a range of 4.8-5.4 ng/ml during the successive 3 years of follow-up.

DISCUSSION

At present, the management of patients with testicular seminoma and nonseminoma is defined by a recent revision of the ESMO Clinical Recommendations. During the follow-up, the majority of disease relapses in patients who obtained a complete response of an advanced GCT is suspected by the increase of the marker levels and confirmed by traditional diagnostic examinations, while any significant evidences regarding the utility of PET/CT have not been documented in this phase of the management. In particular, in case of nonseminoma, the use of PET is not recommended outside of clinical trials. However, in case of seminoma, a PET scan is considered a possible option for stages II/III and its use is recommended only for restaging of disease after treatment in cases of residual tumor >3 cm since it helps to distinguish fibrosis from persistence of viable tumor. Furthermore, such a method, showing images of metabolic alteration, presents the assumptions for its use in identifying disease relapse, considering that tumor cells could be present in still normal sized lymph nodes. Moreover, the standard “whole-body” acquisition protocol of PET examination, that includes head, neck, chest, abdomen and pelvis in a single scan, could be a potential advantage in the clinical practice for restaging of disease. In particular, in our study, PET scan not only was able to correctly identify the only site of disease recurrence excluding others localizations, but also influenced significantly the clinical strategies, avoiding a deep biopsy and addressing to the chemotherapy treatment. The significant reduction of the abnormal PET finding at the end of the chemotherapy evaluated also quantitatively by the SUV(max), together with the decrease of the marker levels, confirmed the high ability of this tool to identify the disease relapse and also shows the possibility to use it in the evaluation of the treatment response, as already highlighted in other studies.

In conclusion, PET/CT could be useful in the management of patients with a GCT with high risk of recurrence, detecting potential relapses of disease non-invasively and being able to influence the clinical strategy. Further clinical trials are necessary in order to confirm the utilities of PET scan in this field, together with cost-effective studies.

REFERENCES

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