Case Report

Fluoride-18 fluorodeoxyglucose positron emission tomography-computed tomography in staging and response evaluation of rare case of non-Hodgkin's lymphoma involving adrenals, liver and bone

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ABSTRACT

Fluoride-18 fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT) is increasingly applied in staging and treatment response assessment of lymphomas. Multiple isolated cases with extranodal involvement of non-Hodgkins lymphoma (NHL), detected on FDG PET-CT, have been previously reported. Here, we report a rare case of extranodal NHL involving multiple sites namely bilateral adrenals, liver and tibia in addition to supraclavicular, iliac and inguinal lymph nodes on FDG PET-CT and treatment response was assessed in follow-up FDG PET-CT.

Key words: Adrenals, bone, fluoride-18 fluorodeoxyglucose positron emission tomography-computed tomography, non-Hodgkin lymphoma

INTRODUCTION

Diffuse large B-cell lymphoma (DLBCL) is the most common type of non-Hodgkins lymphoma (NHL) constituting 33% of all cases. The patient can present either with a primary disease of lymph nodes or that of extranodal sites. More than half of the patients have some site of extranodal involvement at the time of initial diagnosis. Any organ can be involved, with the most common sites being the gastrointestinal tract and bone marrow, each being involved in 15–20% of the patients.[1] Adrenals, liver, and bone involvement is quite uncommon in DLBCL.[2] Uncovering such rare sites in one single patient highlights the role of the whole body fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT) in staging of lymphomas.

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CASE REPORT

A 20-year-old male presented with swelling in the right inguinal region. Examination revealed right inguinal lymph nodal mass which on biopsy confirmed to be DLBCL. He was referred for a baseline whole body FDG PET-CT. Maximum intensity projection images [Figure 1] revealed multiple foci of increased tracer uptake in bilateral adrenal lesions with liver involvement, right tibial lesion, left supraclavicular, iliac and inguinal lymph nodes. He received four cycles of intravenous bolus chemotherapy regimen, rituximab with cyclophosphamide, doxorubicin, vincristine and prednisone. Posttherapy FDG PET-CT revealed no abnormal focus of FDG uptake in the entire

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Figure 1: Whole body fluorodeoxyglucose positron emission tomography-computed tomography maximum intensity projection image showing abnormal tracer foci in left supraclavicular lymph nodes, bilateral adrenals, liver, iliac and inguinal lymph nodes and left tibia involvement

Figure 2: Posttreatment whole body fluorodeoxyglucose positron emission tomography-computed tomography maximum intensity projection image showing no abnormal uptake suggesting complete metabolic response to therapy in all the lesions except in left tibia

body except in left tibia, suggestive of complete metabolic and morphological response to treatment in lymph nodes, adrenal, liver lesions and near complete response in tibial lesion [Figure 2].

DISCUSSION

Non-Hodgkins lymphoma can involve various extranodal sites such as the gastrointestinal tract, bone, brain, testis, ovary, lung, nasopharynx, soft tissue, thyroid, kidney, liver, breast, skin, etc.[1,3] Non-Hodgkin's lymphoma can involve adrenal in almost 25% of cases,[4] either with nodal involvement or as primary adrenal lymphoma. Clinically, the patients may present with features of Addison disease. Bilateral involvement can be seen in up to 50% of cases.[5]

Secondary involvement of the liver in lymphoma is much more common than primary liver lymphoma, which represents only 0.4% of cases of extranodal lymphoma.[6] Non-Hodgkin's lymphoma is more likely to have hepatic involvement than Hodgkin's lymphoma. Diffuse subtypes are more likely to infiltrate the liver compared to nodular histologies. Secondary hepatic lymphoma is relatively common and often subclinical.[7] Secondary hepatic lymphoma has a wider range of appearances, it may appear as multiple or diffusely infiltrating lesions, but is unlikely to appear as a solitary lesion.[8] Associated increased uptake at portal and retroperitoneal nodes are common findings in secondary lymphomatous involvement of the liver.

Primary involvement of bone is classified as stage I disease; involvement in a disseminated lymphoma is grouped as stage IV. Most are NHL type. DLBCL is the most common type and primary Hodgkin lymphoma of the bone is very rare.[9] Presentation can be of the following patterns: Permeative lytic destruction, blastic sclerotic changes, near normal appearance on CT with the destructive pattern being the most common type. Diffuse or focal skeletal uptake on FDG PET-CT may also represent marrow involvement especially when no definite radiographic changes are noted.[10]

Therefore, whole body imaging with a sensitive modality such as FDG PET-CT is mandatory to assess the extent of disease by detecting unexpected extranodal sites of disease or exclusion of disease in the presence of nonspecific extranodal CT findings.[11] In patients with known disease, other goals can be accomplished, which are evaluation of response to therapy, identification of new or recurrent disease, and monitoring the complications of therapy. In the present study, simultaneous involvement of the bilateral adrenals, liver and the left tibia is detected by FDG PET-CT. It is well known that the final diagnosis of lymphoma is based on the pathological diagnosis. However, for ethical reasons, pathological diagnosis may not be possible for all lesions and abnormalities found. Thus, FDG PET-CT is useful for the detection of unusual extranodal involvement.[12]

CONCLUSION

Fluorodeoxyglucose positron emission tomography-computed tomography has become an invaluable investigation in staging and response assessment of lymphoma. In conclusion, the present case highlights the utility of FDG PET-CT in detection of extranodal NHL at unsuspected sites that may have an important bearing on the management and prognosis.

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